Surrey Heath Local Plan: Strategic Highway Assessment Report

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Prepared By: AH, GJ, JL, PTB, SP

Authorised By: WB

Amendment List

Iss. / Rev.	Iss. / Rev Date	Comment
1		
2	11/08/2023	Updated plots to show SH boundary. Additional commentary in Section 7 and Section 8 (SP)
3	24/04/2024	Finalised SHAR

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1 INTRODUCTION

1.1 Purpose of Study

1.1.1 Surrey Heath Borough Council are preparing a new Local Plan. Surrey County Council have been commissioned to assess the impact of the Local Plan allocations, and this document details the results of the modelling undertaken. Whilst the focus of this report is on the model outputs, further detail of the modelling methodology can be found in *Surrey Heath Local Plan: Strategic Highway Assessment Report: Technical Annex.*

1.1.2 Surrey's transport model SINTRAM has been used for the assessment as well as a cordoned Local Model of Surrey Heath and its immediate surroundings. A future year of 2038 has been assessed, to tie in with the end of the Local Plan period. Validation of the model and details of the forecasting methodology is detailed in the Technical Annex referenced above.

1.2 Caveats

1.2.1 It is important to recognise that all models have limitations, including strategic models such as SINTRAM and its associated Local Models. Strategic models cannot represent accurately every individual journey made by every mode and route. They are also not precise in the way they replicate specific individual behaviour and the interaction between vehicles. There are many factors that impact people's travel behaviour and the day-to-day variation in congestion which are random and impossible to predict.

1.2.2 The model is strategic in nature and has good validation at this level, but caution must be exercised, and potentially further data collection required if the model outputs are to be used in detailed junction assessments. The strategic nature of this model and its findings do not in any way reduce the need for individual developments to have detailed, local transport assessments carried out which may identify additional specific impacts on the network (e.g., junction congestion) that require mitigation.

1.2.3 Understanding the limitations of a model is key to making the best use of it and taking advantage of its strengths. The reasonable expectation from this model is that it is able to estimate the likely route choice of transport users, and the resulting average levels of congestion. The results from this model are only one element of a much wider evidence base needed to be considered in the development of further policy documents.

1.3 Scenarios

1.3.1 A future year of 2038 has been assessed, to tie in with the end of the Local Plan period.

1.3.2 Model scenarios are as follows:

- 2038 Do Minimum – this includes growth outside the borough, plus growth from planned and committed developments since 2014 within the borough.
- 2038 Do Something – as above **plus** Local Plan development sites and windfalls.

1.3.3 The accompanying Technical Annex describes the forecasting of growth within and outside the borough in more detail including the inclusion of the following large-scale developments located outside but close to the Surrey Heath boundary, where these have already gained planning permission or are included in Local Plans:

- Hartland Park, Bramshot Lane
- Land at former TRL Site, Old Wokingham Road
- Longcross Garden Village South
- Wellesley (Aldershot Urban Extension)

1.3.4 All of the above sites are included within the Do Minimum scenario with Local Plan growth added on top in the Do-Something scenario.

1.3.5 Results within this report are for the average weekday AM peak hour 0800 – 0900 and PM peak hour 1700 – 1800.

1.3.6 NOTE: The figures and tables in this report are designed for viewing in print and at standard scales, but they have a resolution that enables them to be viewed on-screen with a reasonable level of zoom to facilitate reading and discerning details. All figures are orientated to grid north.

1.4 Site Allocations

1.4.1 For reference, Local Plan site allocations are displayed on maps shown in Figure 1-1 and Figure 1-2 in terms of net change in residents and employees respectively. Table 1-1 lists all the proposed sites with net increase in dwellings and commercial gross floor area. Commercial floor area relates to all non-residential uses and therefore includes community facilities to support development such as community centres, health facilities and pre-schools. At this stage, site access arrangements are indicative and do not represent final locations or junction configurations, as these would be determined later in the planning process for the individual sites when this level of detail is known.

1.4.2 In Figure 1-1 and Figure 1-2, the size of the icon for each site represents the size of the development. It can be seen in Figure 1-1 that residential development is spread amongst the various existing settlements in the borough, with the largest individual sites in terms of dwellings being in Camberley. Figure 1-2 shows an overall loss of commercial use, as many of the allocation sites locations have their existing commercial floorspace replaced by residential use.

Figure 1-1 Residential Local Plan sites by location and number of dwellings

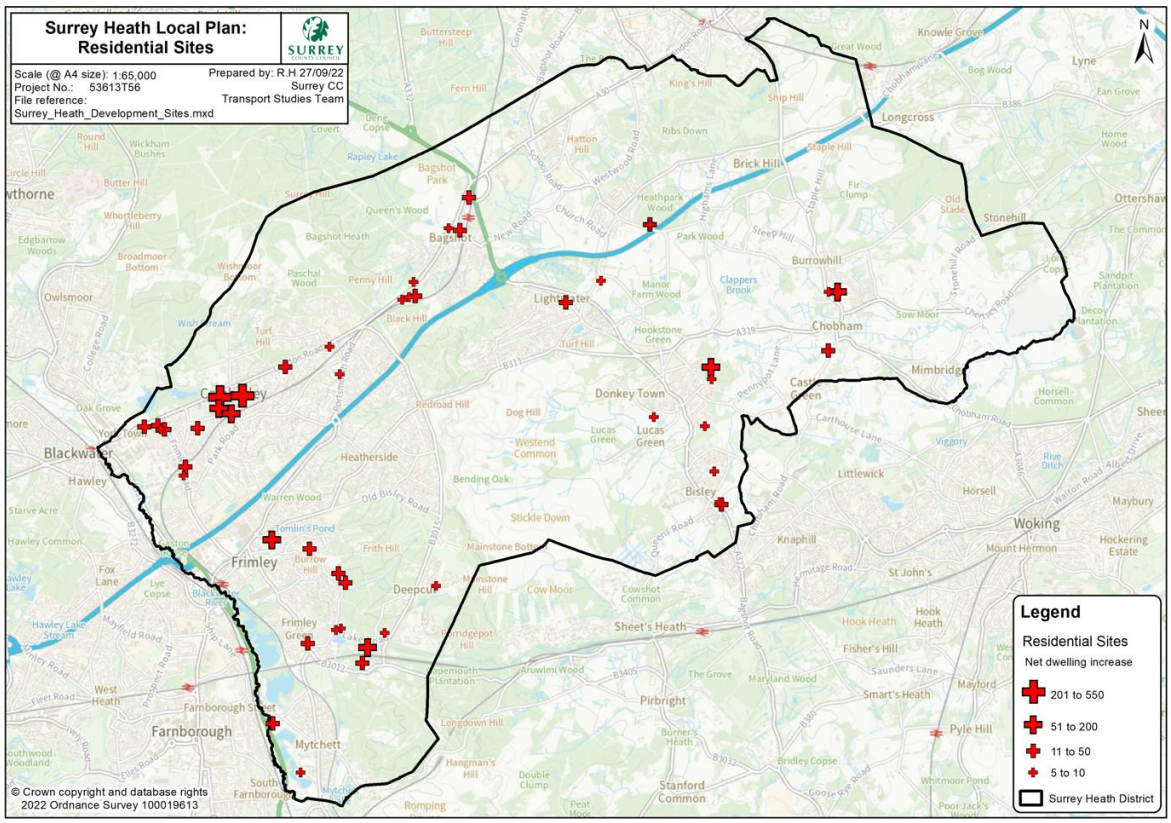


Figure 1-2 Commercial Local Plan sites by location and number of employees

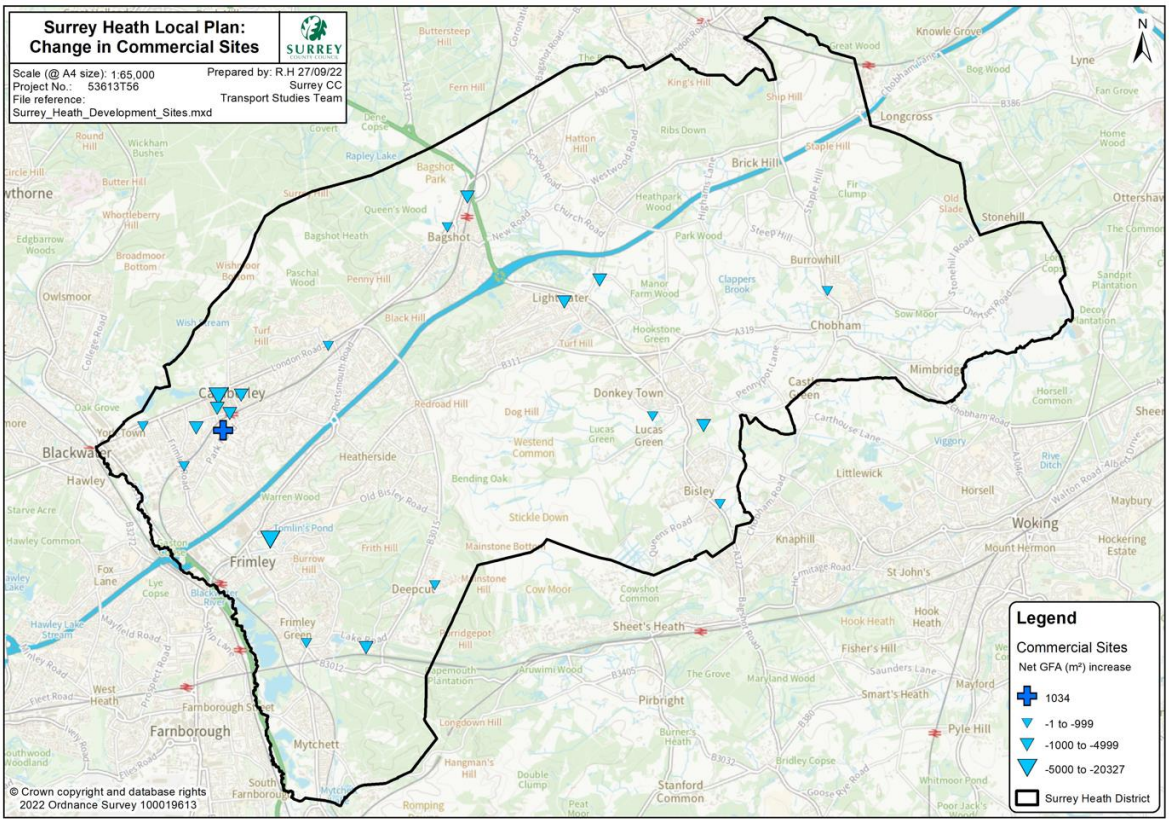


Table 1-1 Local Plan Site Allocations by Location

SLAA	Site	Net Increase in Dwellings	Net Commercial GFA (m^2)
Bagshot			
SLAA407	Highways Farm, 226 London Road, Bagshot, GU19 5EZ	6	0
SLAA408	Land rear of 192-210 London Road, Bagshot, GU19 5EZ	20	0
SLAA448	175 London Road, Bagshot, GU19 5DH	8	0
SLAA901	212 London Road, Bagshot, GU19 5EZ	5	0
SLAA247	Bagshot Depot and Archaeology Centre, London Road, Bagshot, GU19 5HW	50	-2,339
SLAA317	The Deans, Bridge Road, Bagshot, GU19 5AT	20	0
SLAA320	Tanners Yard, London Road, Bagshot, GU19 5HD	9	-560
Bisley			
SLAA573	317 to 319 Guildford Road, Bisley, GU24 9AA	17	-929
SLAA236	Land rear of 309-315 Guildford Road, Bisley, GU24 9AA	6	0
SLAA763	Land at Elder Road, Bisley, GU24 9SA	9	0
Camberley			
SLAA314	280 Gordon Avenue, Camberley, GU15 2NU	15	-864
SLAA717	Burwood House Hotel, 15 London Road, Camberley, GU15 3UQ	10	-754
SLAA811	London Road Regeneration Block, London Road, Camberley, GU15 3JY	550	-8,132
SLAA49	Peerless site North, Sullivan Road, Camberley, GU15 3AZ	8	0
SLAA833	York Town Car Park, Sullivan Road, Camberley, GU15 3BA	27	0
SLAA877	26 Portsmouth Road, Camberley, GU15 1JX	8	0
SLAA295	439 - 445 London Road, Camberley, GU15 3HZ	15	-140
SLAA240	Camberley Centre, France Hill Drive, Camberley, GU15 3QG	35	-1,992
SLAA25	Camberley Station, Station House, 1 Pembroke Broadway, Camberley, GU15 3XD	75	-1,950
SLAA27	Land East of Knoll Road, Camberley, GU15 3SY	475	-4,955
SLAA921	Land East of Park Street, North of Princess Way, Camberley, GU15 3SP	120	-3,154
SLAA424	Land Rear of 1 - 47 Sullivan Road, Camberley, GU15 3AZ	14	0
SLAA832	Land South of Bridge Road, Camberley, GU15 2QN	5	0

SLAA	Site	Net Increase in Dwellings	Net Commercial GFA (m^2)
SLAA801	Pinehurst, 141 Park Road, Camberley, GU15 2LL	0	1,034
SLAA21	61 - 63 London Road, Camberley, GU19 5DT	32	0
Chobham			
SLAA548	Broadford, Castle Grove Road, Chobham, GU24 8EF	15	0
SLAA447	Chobham Rugby Club, Windsor Road, Chobham, GU24 8LD	91	0
SLAA1001	Chobham Club, 50 Windsor Road, Chobham, GU24 8LD	8	-660
Deepcut			
SLAA504	Land North of Lake Road, Deepcut, GU16 6QY	5	0
SLAA757	Land North of Guildford Road, Deepcut, GU16 6NT	21	0
SLAA846	Former Premier Site, Newfoundland Road, Deepcut, GU16 6TA	10	-681
SLAA922	Ballydown, Lake Road, Deepcut, GU16 9NP	5	0
SLAA920	The Grange, St Catherines Road, Deepcut, GU16 9NN	17	0
SLAA552	Land at Frimhurst Farm, Deepcut Bridge Road, Deepcut, GU16 6RF	65	-1,483
SLAA926	Land adjacent to Wykeham Park House, St Catherines Road, Deepcut, GU16 6PY	5	0
SLAA887	Land at Loen, St Catherines Road, Deepcut, GU16 7NJ	18	0
Frimley			
SLAA907	Sir William Siemens Square, Chobham Road, Frimley, GU16 8QD	200	-20,327
SLAA837	Former Playing Field, Lakeside School, Field Lane, Frimley, GU16 8LL	20	0
SLAA329	251 Frimley Green Road, Frimley Green, GU16 6LD	17	-71
Lightwater			
SLAA908	103 - 109 Guildford Road, Lightwater, GU18 5SB	17	-1,137
Mytchett			
SLAA912	Land adjacent to Sherrard Way, Mytchett, GU16 6AU	16	0
SLAA1000	10 Willow Close, Mytchett, GU16 6JE	7	0
West End			
SLAA840	Land rear or 32-34 Benner Land, West End, GU24 9JQ	10	0
SLAA153	Land South of Fenns Lane, West End, GU24 9QF	7	-637
SLAA799	Land North of Old House Lane, West End, GU24 9DB	6	-3,500

SLAA	Site	Net Increase in Dwellings	Net Commercial GFA (m^2)
SLAA178	Land east of Benner Lane, West End, GU24 9JQ	73	0
Windlesham			
SLAA844	Land at Chamness, Woodlands Lane, Windlesham, GU20 6AS	9	0
SLAA834	Broadway Green Farm, Broadway Road, Windlesham, GU18 5SU	7	-1,210
SLAA1004	St Margarets Cottage and The Ferns, Woodlands Lane, Windlesham, Surrey,	20	0
TOTAL		**2,208**	**-54,441**

1.4.3 The total change in the amount of housing included within the borough in the modelled scenarios is 7,891 units between 2014 and 2038. In addition to the site allocations listed above, this figure includes:

- Committed development either completed since 2015 or sites with extant planning permission totalling 5,226 dwellings (included in the Do Minimum scenario)
- Small sites (windfall) allowance totalling 457 dwellings (included in the Do Something option only)

2 SUMMARY STATISTICS

2.1 Scenario Overview

2.1.1 The matrix totals for all vehicles (car, LGV and HGV) are presented in Table 2-1. As expected, the Do Something has more trips than the Do Minimum; in the AM the Do Something has a 0.27% increase in trips while in the PM it is 0.16%. This is a relatively low increase in trips for the number of households, due to the net loss in commercial land use, which is also why the increase is higher in the AM peak hour.

Table 2-1 Vehicle trip matrix totals by scenario with differences from the Do Minimum

Scenario	AM Peak Hour (0800 – 0900)			PM Peak Hour (1700 – 1800)		
	Vehicles per Hour	Difference from DM	% Diff	Vehicles per Hour	Difference from DM	% Diff
2038 DM	139,860	-	-	119,795	-	-
2038 DS	140,238	378	0.27%	119,988	193	0.16%

2.1.2 The Total Vehicle Distance, Total Vehicle Time and Average Speed are presented in Figure 2-1, Figure 2-2 and Figure 2-3 respectively for the borough of Surrey Heath. Total vehicle distance and travel time are greater in the AM peak hour than the PM peak hour, across all scenarios. This shows that the AM peak hour is more congested, which is typical as peak commuting and education escort trips coincide

2.1.3 As expected, in the Do Something scenario there is a higher Total Vehicle Distance and Total Vehicle Time and a lower Average Speed than in the Do Minimum. This is due to more trips as shown in Table 2-1 in the Do Something due to the proposed Local Plan development.

2.1.4 The decrease in network performance as illustrated by the reduction in average speed and the increase in vehicle hours and distance is minimal, indicating that the relatively low numbers of trips generated by the Local Plan developments are not causing significant additional congestion across the borough as a whole.

Figure 2-1 AM and PM peak hour Total Vehicle-Kilometres for the 2037 Do Minimum (DM) and Do Something (DS) for Surrey Heath Borough

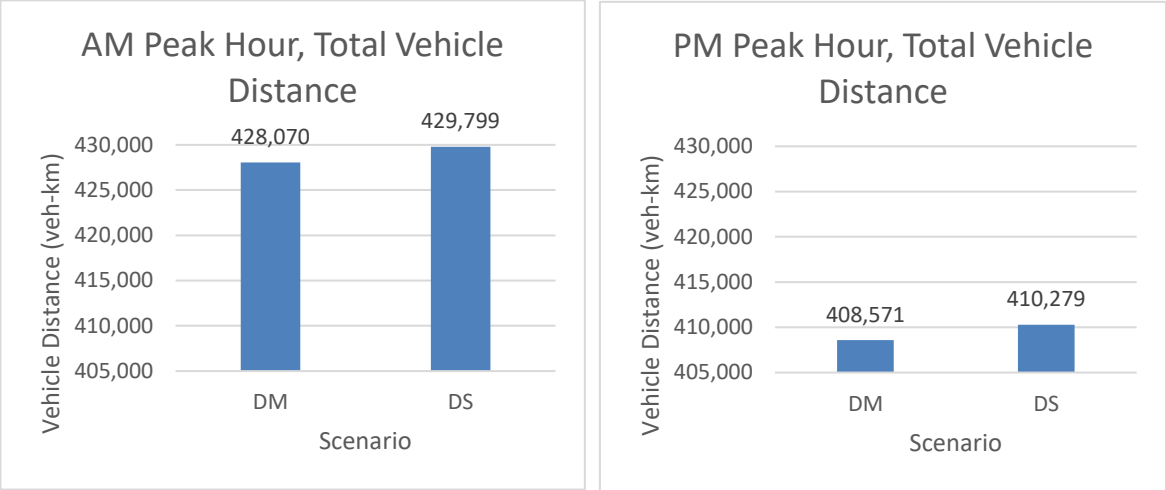


Figure 2-2 AM and PM peak hour Total Vehicle-Hours for the 2037 Do Minimum (DM) and Do Something (DS) for Surrey Heath Borough

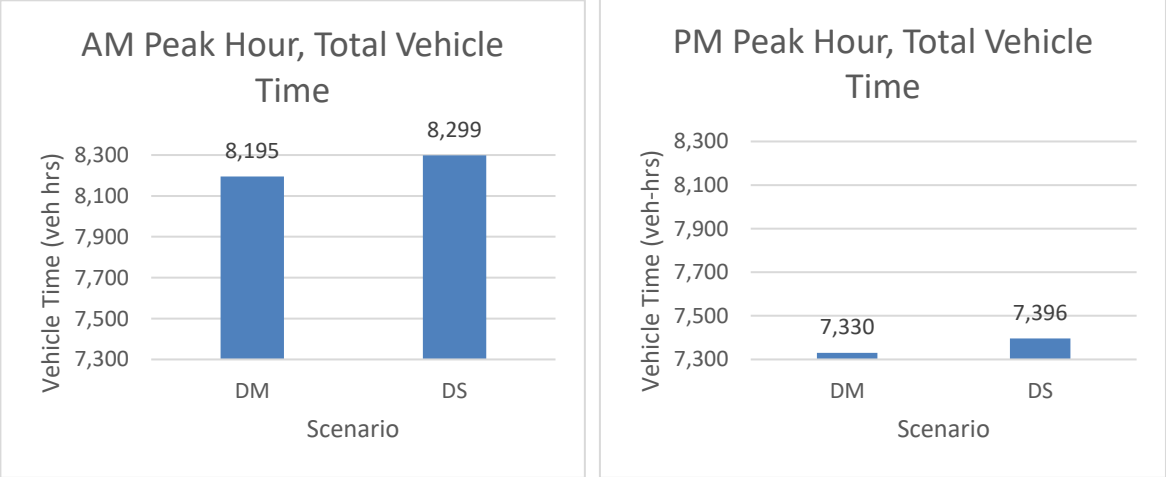
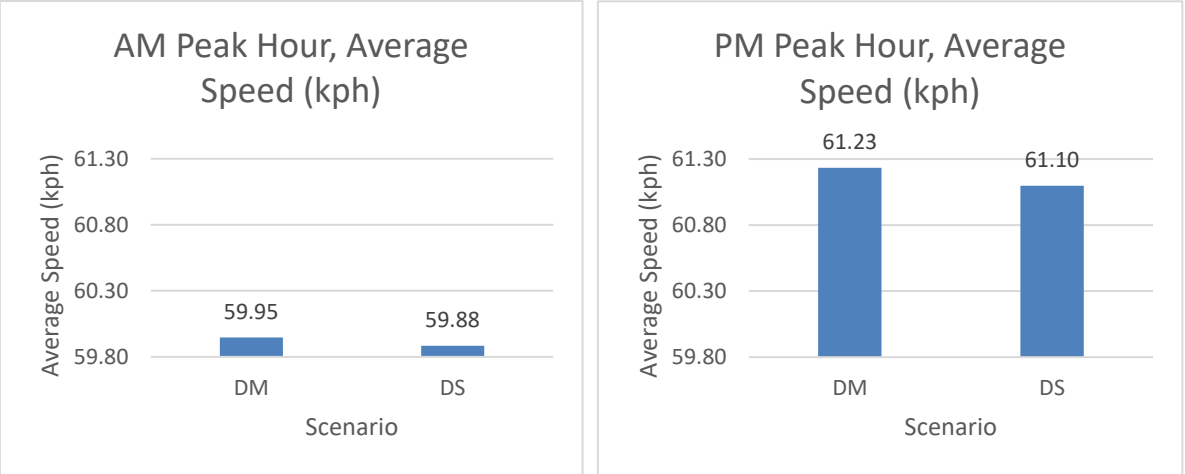


Figure 2-3 AM and PM peak hour Average Link Speed for the 2037 Do Minimum (DM) and Do Something (DS) for Surrey Heath Borough



3 LINK ANALYSIS

3.1.1 This section shows how the vehicle flows associated with the largest allocation sites would disperse on the road network. The cumulative impact this causes on the road links in the network has been examined: generally, links with increases in flow in excess of 5 PCU during the peak hour are listed, together with those which occur in sensitive locations or which are related to specific development sites.

3.1.2 Flow difference plots have been produced for the Do Something Scenarios, in comparison with the Do Minimum scenario. Surrey Heath only flow difference plots are presented in Figure 3-1 and Figure 3-2. Flow difference plots illustrating the impact in neighbouring boroughs and districts are presented in Figure 3-3 and Figure 3-4.

3.1.3 Bandwidths coloured red show an increase in flow, whereas those coloured blue represent a decrease in flow, with their size being proportional to the increase or decrease. Units shown on the plots are passenger car units (PCU). One car or LGV is considered as a standard unit whilst HGVs are considered equivalent to 2 cars or 2 PCU.

3.1.4 During the AM peak hour, the largest increase in flow in the district as shown in along the A322 grade separated roundabout, just off the eastbound exit of Junction 3 of the M3, where an increase of between 60 and 95 PCU occurs. The main reason for this increase is due to around 80 PCU exiting and then re-entering the M3 motorway eastbound carriageway via the roundabout. In reality, that traffic would most likely continue along the M3.

3.1.5 Other noticeable increases include Knoll Road, where an increase of 55 PCU is seen. This is caused by the development of land to the east of Knoll Road which will see the replacement of the library and council offices with a large housing development of 475 dwellings. This also helps contribute to an increase of 40 PCU westbound along the A30 between the junctions with Knoll Road and Victoria Avenue plus eastbound an increase of around 30 PCU between the junctions with Knoll Road and A325 Portsmouth Road, leading onto the B3015 The Maultway (southbound direction).

3.1.6 However, Camberley Town Centre would also see decreases in traffic flow. Redevelopment of land to the east of Park Street and north of Princess Way, leads

to sharp drop in trips generated which are witnessed at the Southwell Park Road/Pembroke Avenue Roundabout where circulating flows fall by over 100 PCU in parts through far more modest falls are witnessed on adjacent arms with Park Street seeing falls in both directions. In addition, Obelisk Way and St George's Road which runs off Knoll Road decrease in both directions by just over 40 PCU and 30 PCU respectively, likely as a result of a decrease in trips generated by the change in land use from commercial to residential use because of the nearby London Road Regeneration Scheme

3.1.7 Overall, the changes in traffic flow in other parts of the are not significant, with areas such as Bagshot, Chobham, Bisley, Lightwater and Windlesham seeing at worst very small increase in flow up to around 30 PCU.

3.1.8 In the PM peak hour, the largest increase in flow occurs in the northbound direction around the grade separated A322 roundabout off Junction 3 of the M3 with an increase of between 50 to 54 PCU up to the junction with New Road. New Road itself consequentially sees an increase eastbound of 38 PCU eastbound towards the junction with Church Road.

3.1.9 Camberley see more widespread falls in the number of trips generated. The A30 westbound sees decreases in flow around 20 PCU west of the junction with Knoll Road up to The Meadows Roundabout. This seems to be mainly caused by re-development off Obelisk Way and St George's Road, which see larger falls of up to 99 PCU eastbound and 74 PCU westbound.

3.1.10 In addition, decreases in flow occur in the vicinity of the Southwell Park Road/Pembroke Avenue Roundabout with circulating flows falling by over 100 PCU in places and along Park Street which sees a decrease of 72 PCU northbound and 33 PCU southbound. Smaller decreases in flow (up to 41pcu) are seen in both directions along Gordon Road/Parkway/Watchetts Drive.

3.1.11 In comparison, Frimley sees predominant increases in flow, particularly along the A325 between the B3411 roundabout and B311 Chobham Rd/ Hospital Access. Eastbound flows increase between 27 and 38 PCU. Westbound flows also increase albeit by a smaller amount.

3.1.12 Bagshot sees minor increase southbound of up to 37 PCU along London Road, south of the junction with the A322 but no major changes. Similar to the AM peak hour, areas such as Chobham, Bisley, Lightwater and Windlesham see very little if any change.

3.1.13 There are minor increases in flow in neighbouring districts and boroughs. In the AM peak hour increases in flow are seen to the north of Surrey Heath in Bracknell Forest, The Royal Borough of Windsor and Maidenhead, and to the northeast in Runnymede. These increases are relatively modest.

Figure 3-1 Link flow difference plots for the Surrey Heath network, Do Something compared with Do Minimum in AM peak hour

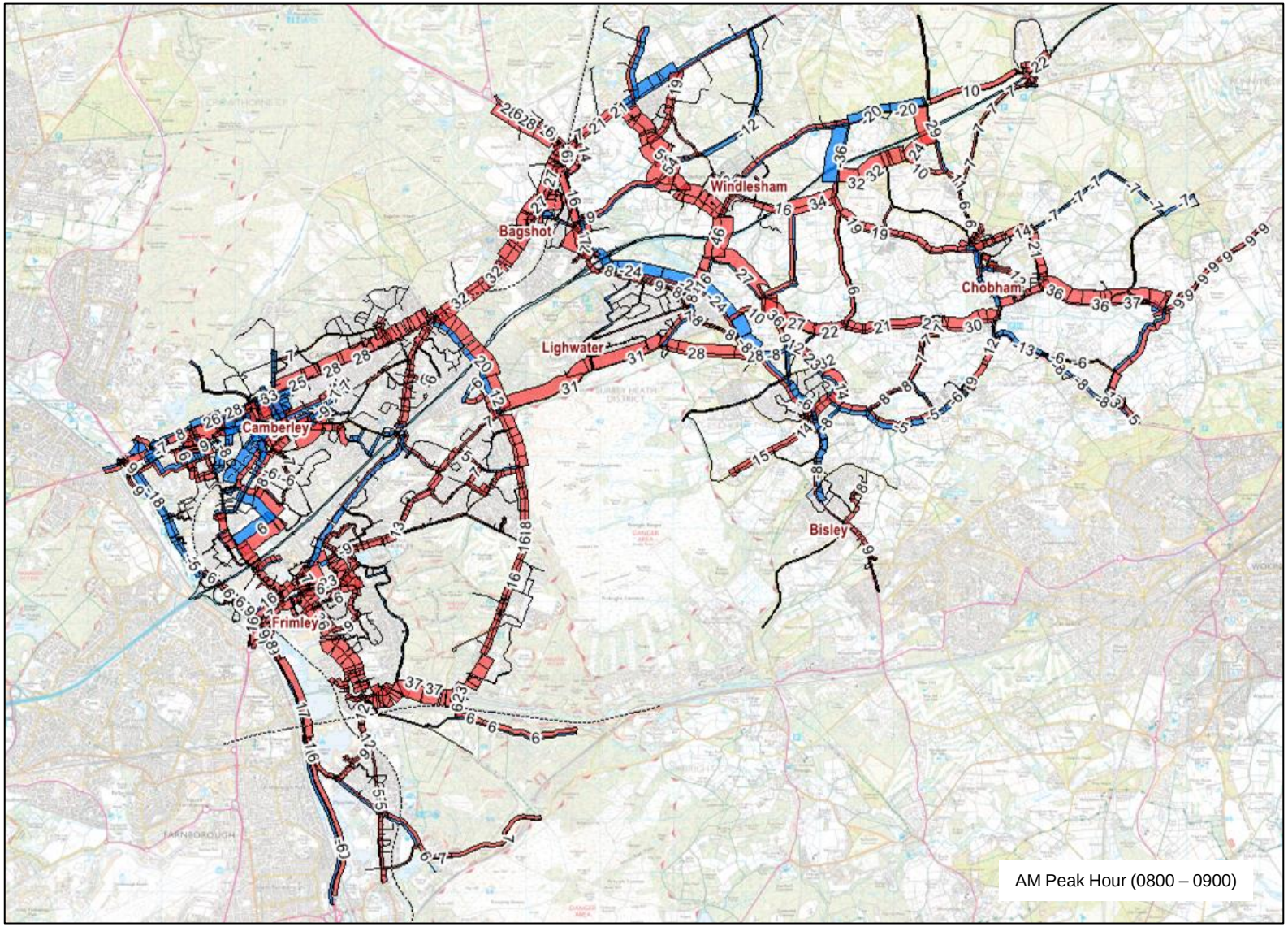


Figure 3-2 Link flow difference plots in the Surrey Heath Borough, Do Something compared with Do Minimum in the PM peak hour

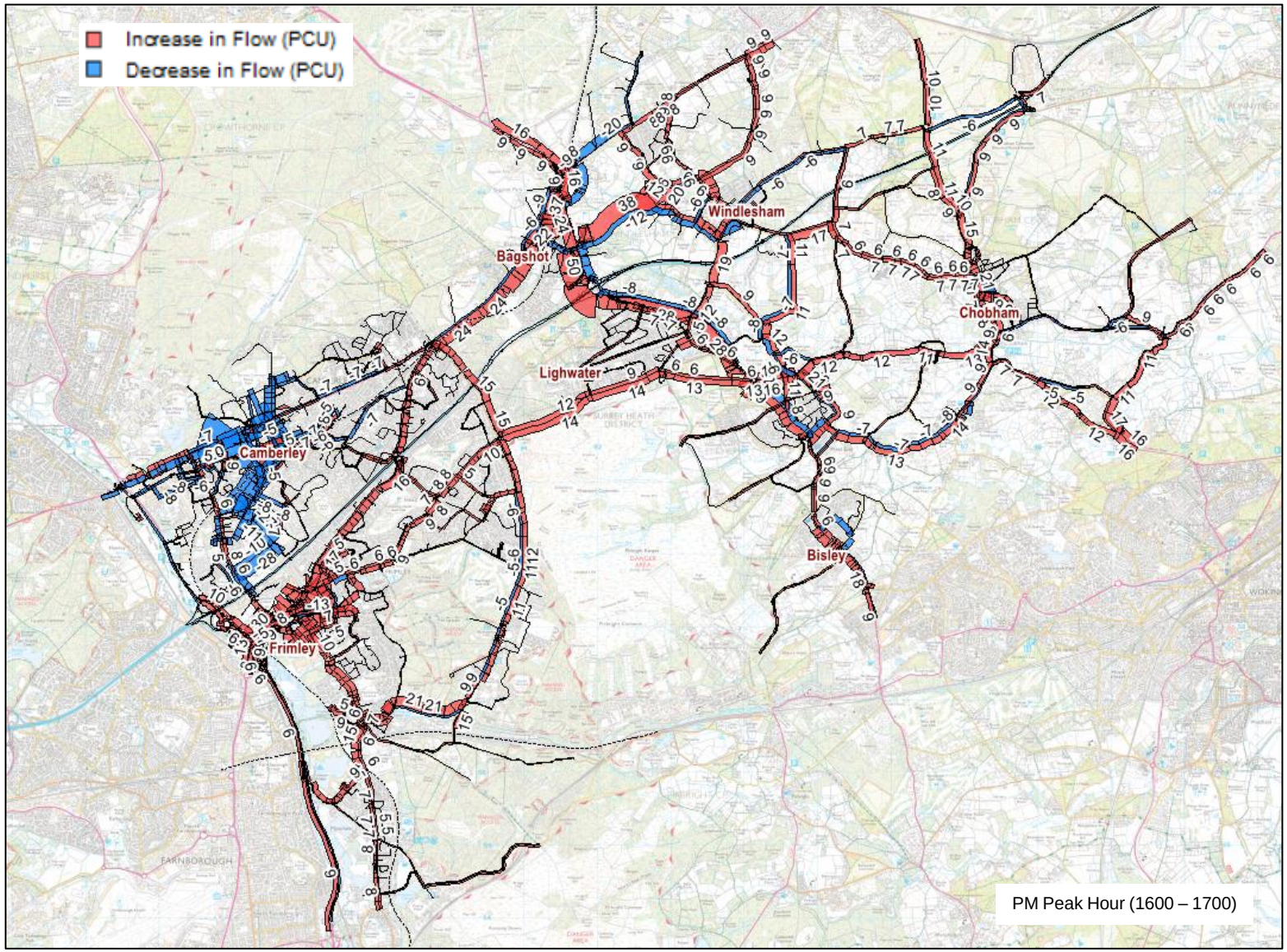


Figure 3-3: Link flow difference plots for the Surrey Heath and neighbouring boroughs and districts, Do Something compared with Do Minimum in AM peak hour. Surrey Heath's boundary is illustrated by the purple border.

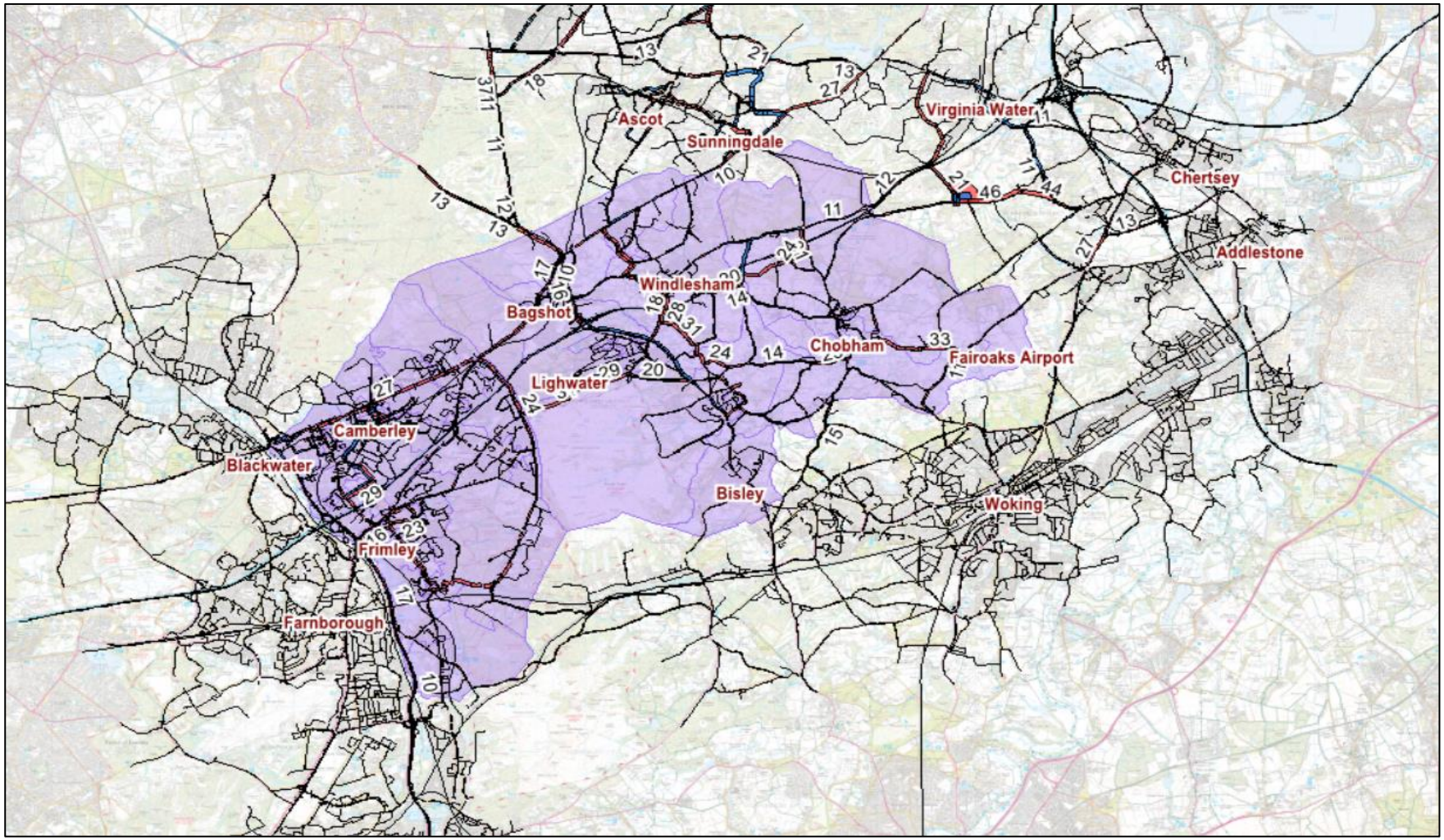
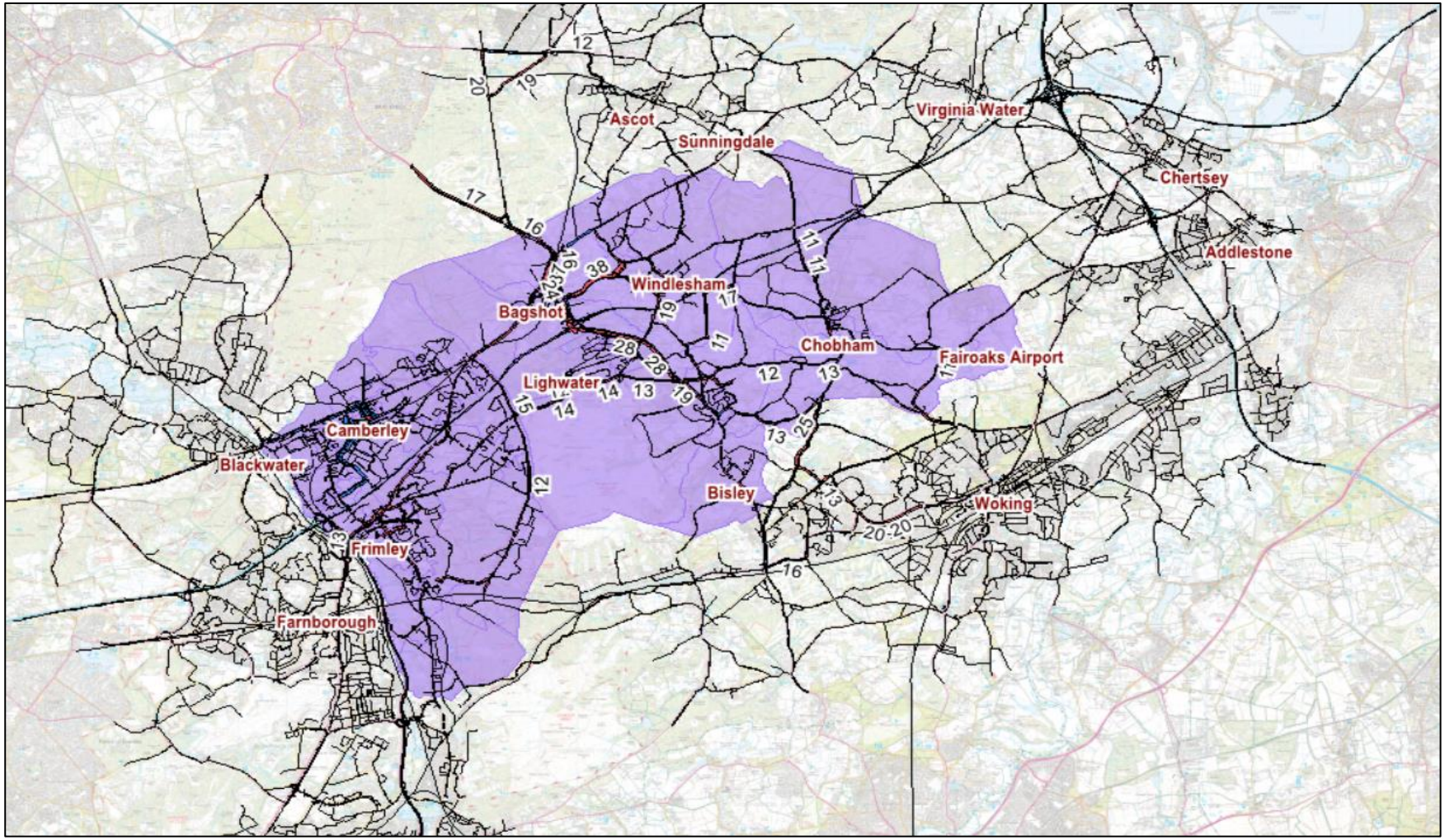


Figure 3-4: Link flow difference plots for the Surrey Heath and neighbouring boroughs and districts, Do Something compared with Do Minimum in PM peak hour. Surrey Heath's boundary is illustrated by the purple border.



3.1.14 Links were assessed based on Level of Service (LOS) as defined in the Highways Capacity Manual[1] and shown below in Table 3-1.

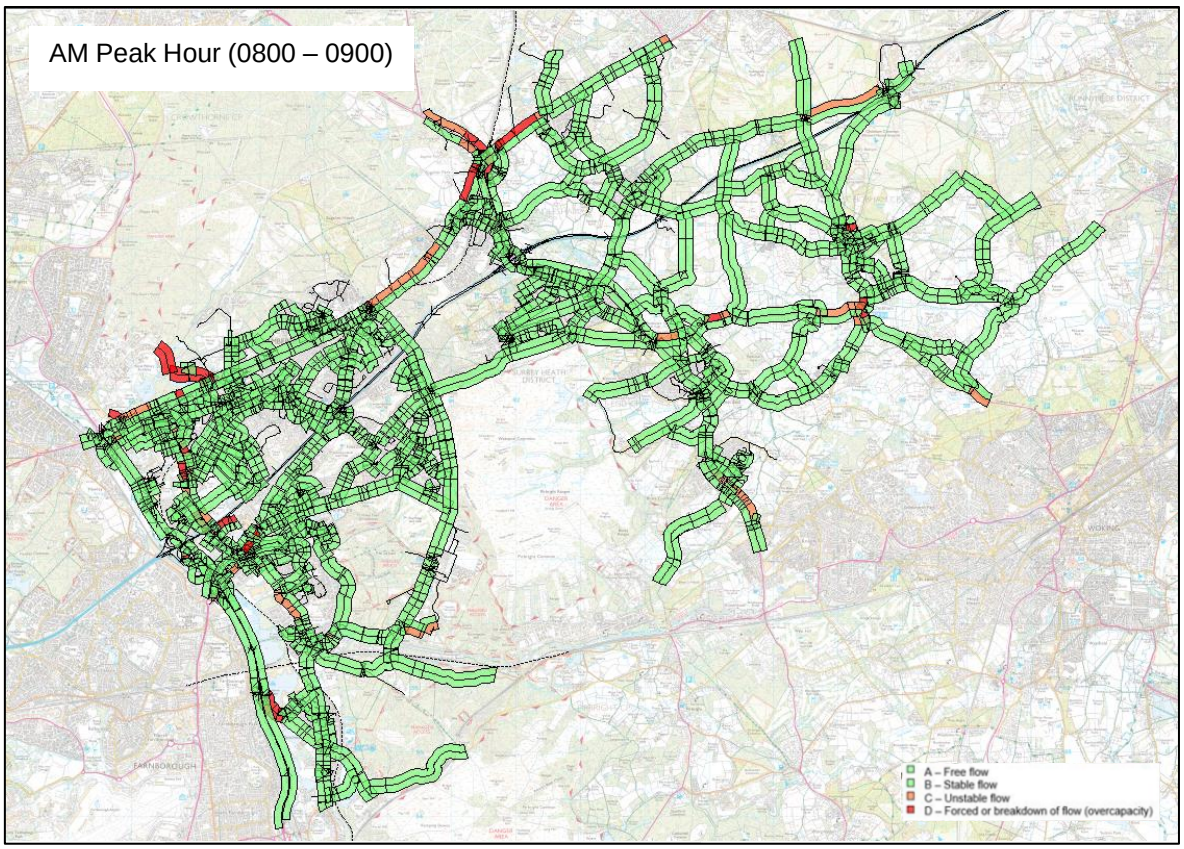
Table 3-1 Level of Service definitions for links.

LOS	Definition
A	Free flow
B	Stable Flow
C	Unstable Flow, operating at capacity
D	Forced or breakdown of flow (overcapacity)

3.1.15 When reviewing link Level of Service, it should be noted that links and junctions do not interact in the strategic model as would happen on street i.e., there is no queuing back from junctions. The level of service is therefore purely based on the ratio of flow to the capacity of the link.

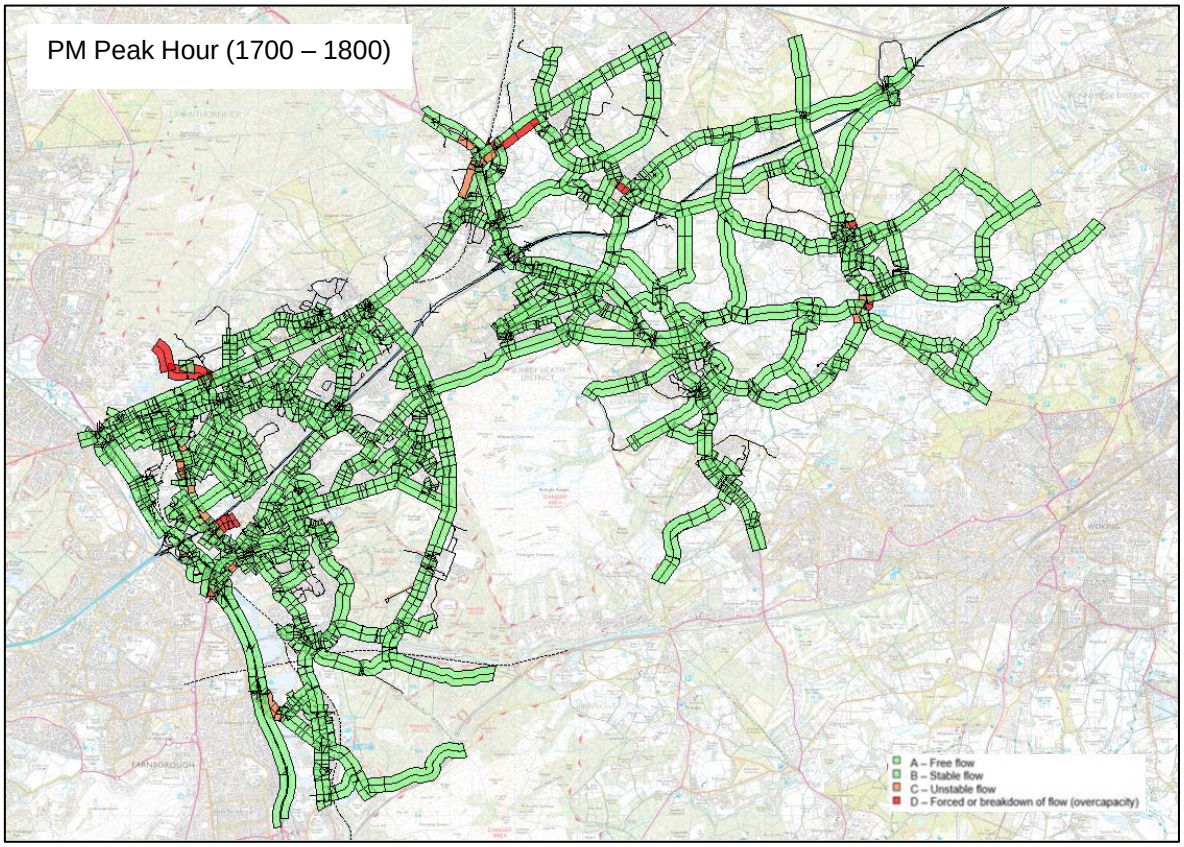
3.1.16 Figure 3-5 Link Level of Service for Do Something AM peak hour and Figure 3-6 presents the Level of Service (LOS) of all roads within the District for the Do Something scenario AM and PM peak hours respectively. Bandwidths are coloured as in Table 3-1, green for free flow and stable flow (LOS A and B); orange for unstable flow, operating at capacity (LOS C); and red for forced or breakdown of flow (LOS D). In the Do Minimum scenario t/he majority of links within Surrey Heath have a LOS of A or B indicating free or stable flow, with just a small number of links at level C or D indicating unstable flow or breakdown of flow.

Figure 3-5 Link Level of Service for Do Something AM peak hour



[1] Highway Capacity Manual, Transportation Research Board, 2010

Figure 3-6 Link Level of Service for Do Something PM peak hour



3.1.17 Links were evaluated based on whether their Level of Service degraded in the Do Something scenario to C or below, and whether they were already at a Level of Service of D in the Do Minimum and this was maintained in the Do Something. Note that this section deals with the capacity of the links themselves rather than the junctions that they may form a part of. Within a strategic model the two elements do not interact and are therefore reported separately. Affected links are listed below for the AM peak hour below:

- A3046 High Street southbound approach to the junction with A3046 Station Road (LOS maintained at D)
- A319 High Street northbound approach junction with A319 Chertsey Road (LOS maintained at D)
- A30 London Road exit from the junction with A325 Portsmouth Road and B3015 'The Maultway' (LOS maintained at D)
- Heather Way southbound direction, Burrowshill (LOS maintained at D)
- Capper Road in both directions (LOS maintained at D)
- Staff College Road in both directions (LOS maintained at D)
- Laundry Lane southbound approach to junction with A30 (LOS maintained at D)
- A30 London Road eastbound approach to the junction with The Avenue (LOS maintained at D)
- A322 Bracknell Road southbound approach to Grove End turn off (LOS maintained at D)

- A30 northbound approach to the diverge onto the A322 Bracknell Road northbound carriageway (LOS maintained at D)
- A30 London Road northbound between the junction with Bridge Road and junction with B386 School Road (LOS maintained at D)
- B3029 New Road roundabout with Withmoor Road and the New Road eastbound approach to the A322 Signals, Bagshot (LOS maintained at D)
- B3411 Frimley Road northbound approach to the junction with Bridge Road/Watchetts Road (LOS maintained at D)
- All sections of the circulatory carriageway at the B3411 Frimley Road/Park Rd roundabout (LOS maintained at D)
- B3411 Frimley Road northbound approach junction with Watchetts Drive (LOS maintained at D)
- A325 Portsmouth Road westbound towards the B3411 Frimley Road Roundabout (LOS maintained at D)
- Gilbert Road eastbound direction just off the junction with B3411 Frimley Road gyratory (LOS maintained at D)
- B3411 Frimley Green Road northbound approach to junction with Balmoral Drive (LOS maintained at D)
- Coleford Bridge Road (in both directions) between A331 off-slip and junction with Hamesmoor Road (LOS maintained at D)
- Sections of the circulatory carriageway of the Frimley High street dual roundabouts over the A331 (LOS maintained at D)
- Sections of the circulatory carriageway of the A331 roundabout access/exit to and from J4 of the M3 (westbound direction) (LOS maintained at D)
- B3411 Frimley Green Road northbound approach to roundabout with Balmoral Drive (LOS deteriorates from C to D).

3.1.18 No sites within Surrey Heath experience a deterioration in Level of Service to C or below during the PM peak hour.

3.1.19 Several sites do maintain a LOS equal to D in the PM peak hour. These include:

- A325 Portsmouth Road westbound towards the B3411 Frimley Road Roundabout (LOS maintained at D)
- A30 London Road westbound approach to the Grove End Roundabout (LOS maintained at D)
- A319 High St southbound approach to the junction with A3046 High Street (LOS maintained at D)
- B3411 Frimley Road northbound approach to junction with Watchetts Drive (LOS maintained at D)
- B386 Updown Hill northbound approach to junction with Pound Lane (LOS maintained at D)
- B3411 Church Road eastbound approach to the junction with Grove Cross Road (LOS maintained at D)
- A section of Heather Way in both directions, Burrowshill (LOS maintained at D)
- All sections of the circulatory carriageway at the B3411 Frimley Road/Park Rd roundabout (LOS maintained at D)
- Capper Road in both directions (LOS maintained at D)

- Staff College Road in both directions (LOS maintained at D)
- Gilbert Road in both directions just off junction with B3411 Frimley Road gyratory (LOS maintained at D)
- Sections of the circulatory carriageway of the Frimley High Street dual roundabouts over the A331 (LOS maintained at D)
- Sections of the circulatory carriageway of the A331 roundabout access/exit to and from J4 of the M4 (westbound direction) (LOS maintained at D)

3.1.20 Figure 3-7 and Figure 3-8 illustrate the Do Something link LOS for links external to Surrey Heath in the AM and PM peak hours respectively. Bandwidths are coloured as in Table 3-1, green for free flow and stable flow (LOS A and B); orange for unstable flow, operating at capacity (LOS C); and red for forced or breakdown of flow (LOS D).

Figure 3-7: Link Level of Service for Do Something AM peak hour including neighbouring boroughs and districts. Surrey Heath's boundary is illustrated by the purple border.

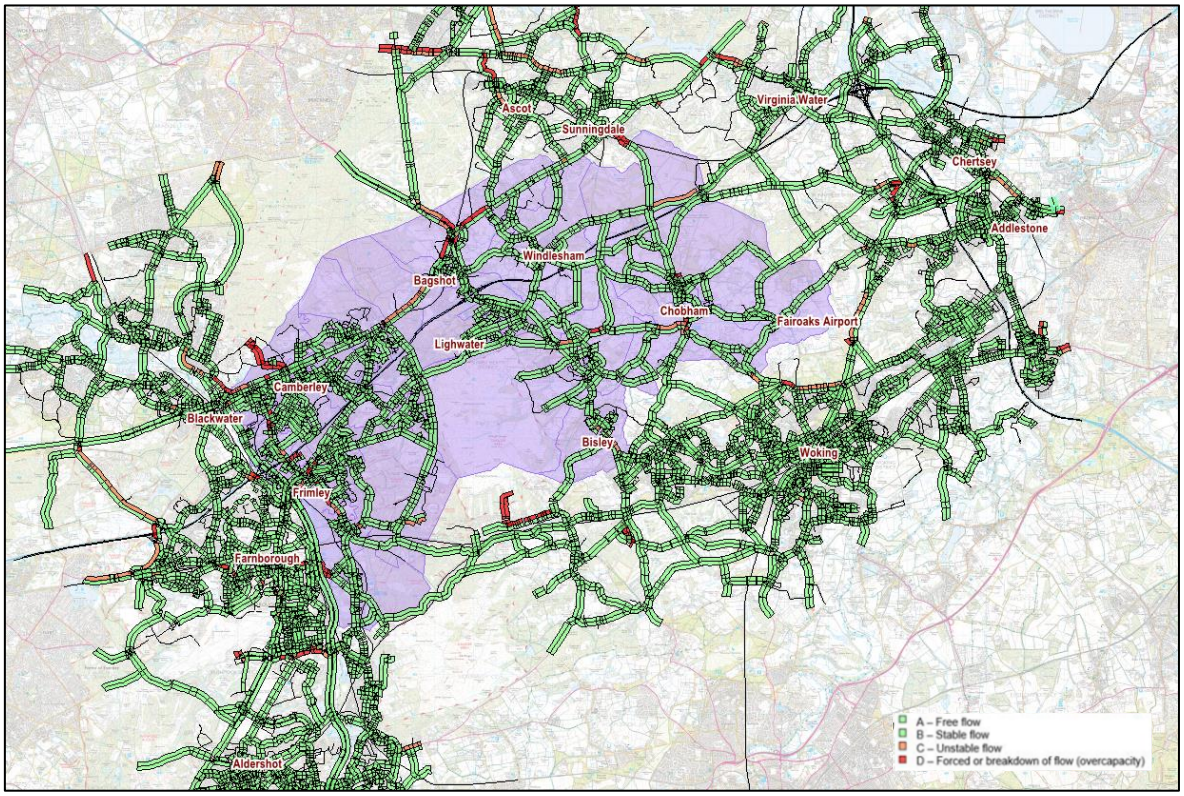
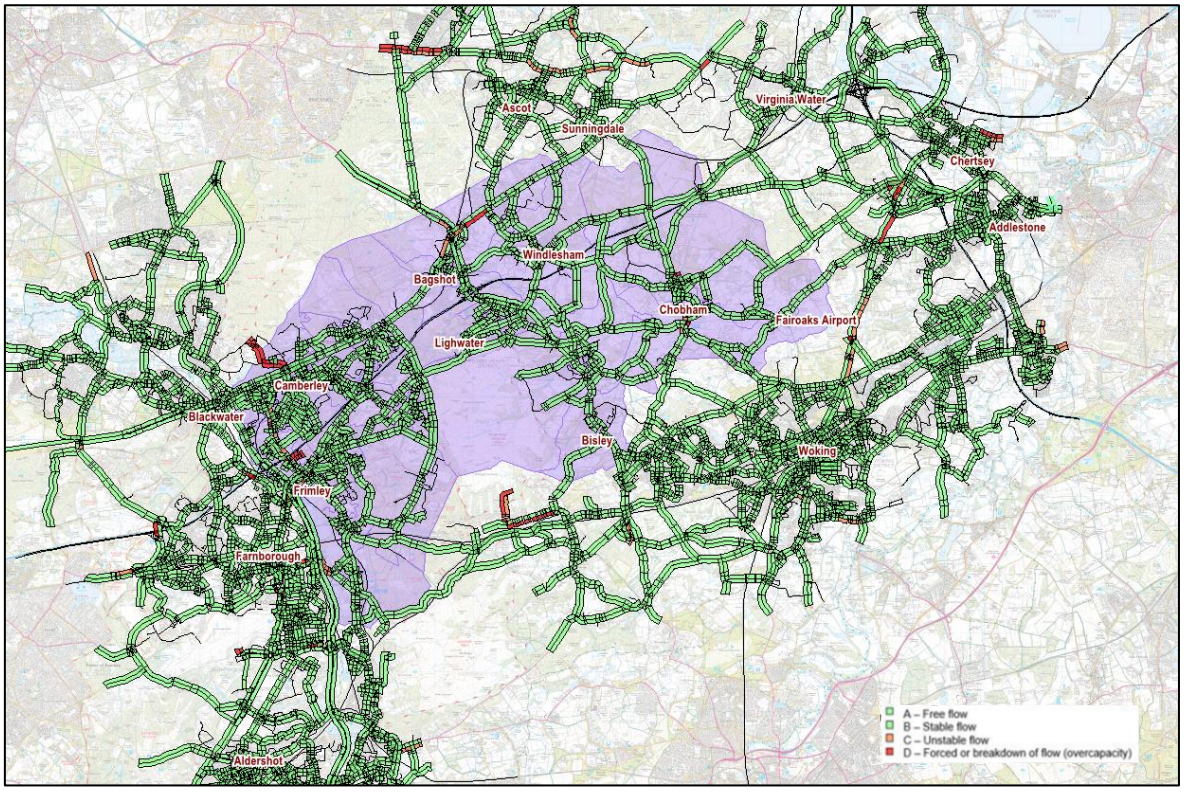


Figure 3-8: Link Level of Service for Do Something PM peak hour including neighbouring boroughs and districts. Surrey Heath's boundary is illustrated by the purple border.



3.1.21 In the AM peak hour, no links deteriorate to a LOS of C or D in response to the Do Something scenario. However, in the PM peak hour, several links deteriorate to a LOS of C or D in response to the Do Something scenario. These include:

- Eastbound exit from Bradfords Roundabout to roundabout with A331 / Frimley Highstreet, Rushmoor (LOS deteriorates from C to D);
- A329 London Road eastbound, Windsor and Maidenhead (LOS deteriorates from B to C);
- B3272 Hawley Lane eastbound approach to Bradfords Roundabout, Rushmoor (LOS deteriorates from C to D);
- A320 Guildford Road southbound approach to the Ottershaw Roundabout, Runnymede (LOS deteriorates from C to D); and
- Six Cross Roads roundabout between Chertsey Road and Woodham Road, Woking (LOS deteriorates from C to D).

4 JUNCTION ANALYSIS

4.1.1 Junctions were assessed based on average delay per vehicle. This was then converted to a Level of Service (LOS) band according to the Highway Capacity Manual[2] outlined in Table 4-1. Note that there are more Level of Service bands for

[2] Highway Capacity Manual, Transportation Research Board, 2010

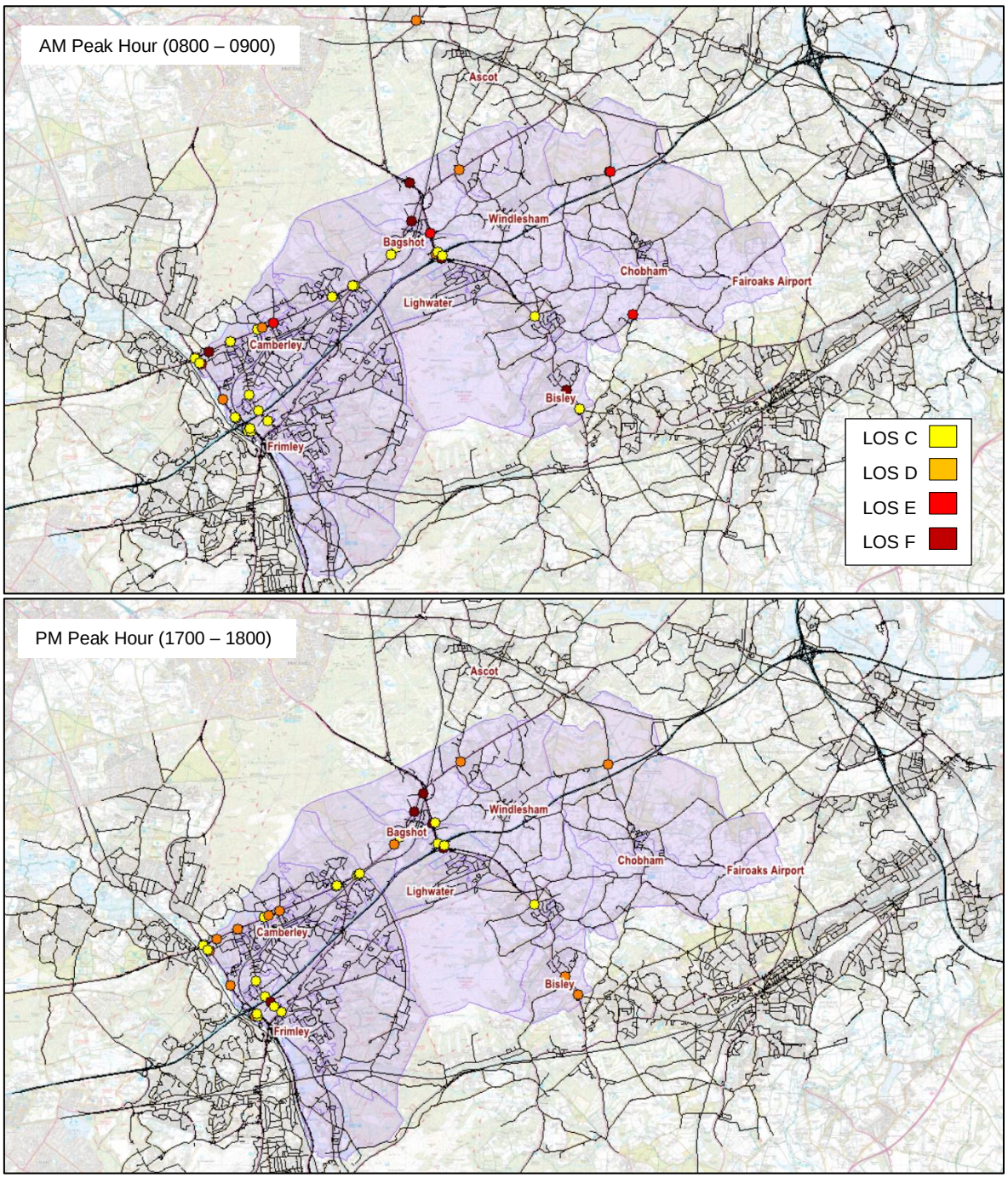
junctions than links with levels going from A, free flow to F, forced or breakdown flow.

Table 4-1 Level of Service categorisation for junctions as outline by the HCM

LOS	Definitions	Signalised Junction	Unsignalised Junction
A	Free flow	≤10 sec	≤10 sec
B	Reasonably free flow	10-20 sec	10-15 sec
C	Stable flow, at or near free flow	20-35 sec	15-25 sec
D	Approaching unstable flow	35-55 sec	25-35 sec
E	Unstable flow, operating at capacity	55-80 sec	35-50 sec
F	Forced or breakdown flow	≥80 sec	≥50 sec

4.1.2 The majority of junctions in the Do Minimum scenario have available capacity and/or average vehicle delay of less than 25 seconds during both time periods. Figure 4-1 shows all junctions with a Level of Service of C or worse in the Do Minimum scenario. There are sixteen locations in the AM peak hour and seventeen in the PM peak hour where junction delay is at a level which is resulting in unstable flow i.e., LOS D to F.

Figure 4-1 Do Minimum Level of Service (LOS) for junctions classified ≥ C. Surrey Heath's boundary is illustrated by the purple border.



4.1.3 Figure 4-2 shows all junctions where Level of Service deteriorates to D or below, or where it is maintained at D, E or F for the Do Something scenario. These are locations which experience an increase in delay related to the Local Plan or where delay in the Do Minimum scenario is already significant. Note that junctions which are already at LOS C in the Do Minimum and remain at C in the Do Something are excluded from the plot. At LOS C the flow at a junction is considered to be stable and performing adequately.

4.1.4 Junctions with a Level of Service which deteriorates in the Do Something scenario, or which is already at D, E and F are listed below for the AM peak hour.

- New Road priority junction with Church Road, Windlesham (LOS deteriorates from B to C)
- A331 Blackwater Valley Road signalised junction with Sainsbury's, Camberley (LOS maintained at D)
- A30 London Road junction with Staff College Road, Camberley (LOS maintained at D)
- A325 Portsmouth Road signalised arm of the roundabout junction with A30 London Road, Camberley (LOS maintained at D)
- M3 eastbound J3 off-slip signalised arm of the grade separated roundabout junction with A322, Lightwater (LOS maintained at D)
- B3020 Sunninghill Road signalised junction with A30 London Road, Windlesham (LOS maintained at D)
- B386 Chertsey Road west arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham (LOS maintained at D)
- A331 Blackwater Valley Road signalised junction with Stanhope Road, York Town (LOS maintained at E)
- A30 London Road signalised junction with King's Ride and Knoll Road, Camberley (LOS maintained at E)
- Castle Grove Road priority junction with Guildford Road, Chobham (LOS maintained at E)
- A322 Bracknell Road signalised junction with B3029 Guildford Road, Bagshot (LOS maintained at E)
- B383 Chobham Road arm of the roundabout junction with B386 Chertsey Road, Chobham (LOS maintained at E)
- A30 London Road signalised junction with Laundry Lane, Camberley (LOS maintained at F)
- A30 London Road signalised junction with Bridge Road, Bagshot (LOS maintained at F)
- A322 Bracknell Road signalised arm of the grade separated roundabout junction with M3 J3, Lightwater (LOS deteriorates from C to F)
- A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater (LOS maintained at F)
- A322 Bracknell Road priority junction with Dukes Covert, Bagshot (LOS maintained at F)
- A322 Guildford Road signalised junction with Clew's Lane and Queen's Road, Bisley (LOS maintained at F)
- A329 London Road eastbound approach to roundabout with A332 Kings Ride / A329 High Street / A332 Windsor Road (LOS deteriorates from D to E). This junction is within The Royal Borough of Windsor and Maidenhead.

4.1.5 From the list above, the largest increase is a 40 seconds per vehicle at the A322 Bracknell Road signalised arm at the M3 Junction 3 grade separated roundabout in Lightwater. This increase is also partly due to a small amount of M3 traffic travelling via the slip roads in the model to avoid delay on the mainline, as discussed in paragraph 5.1.4 in the next Section on Motorways.

4.1.6 The next highest increase is 6 seconds at the New Road priority junction with Church Road in Windlesham. This deteriorates to a Level of Service of C, but flow remains stable, and the junction is still operating well within capacity. All the other junctions have increases of just 4 seconds or less in the AM peak hour.

4.1.7 As well as the A322 Bracknell Road arm of the M3 Junction 3 containing the greatest increase in delay, the A322 Lightwater By-Pass arm is categorised with a Level of Service F, and the M3 eastbound off-slip has a Level of Service D, meaning the majority of the grade separated junction is operating poorly. There is a junction

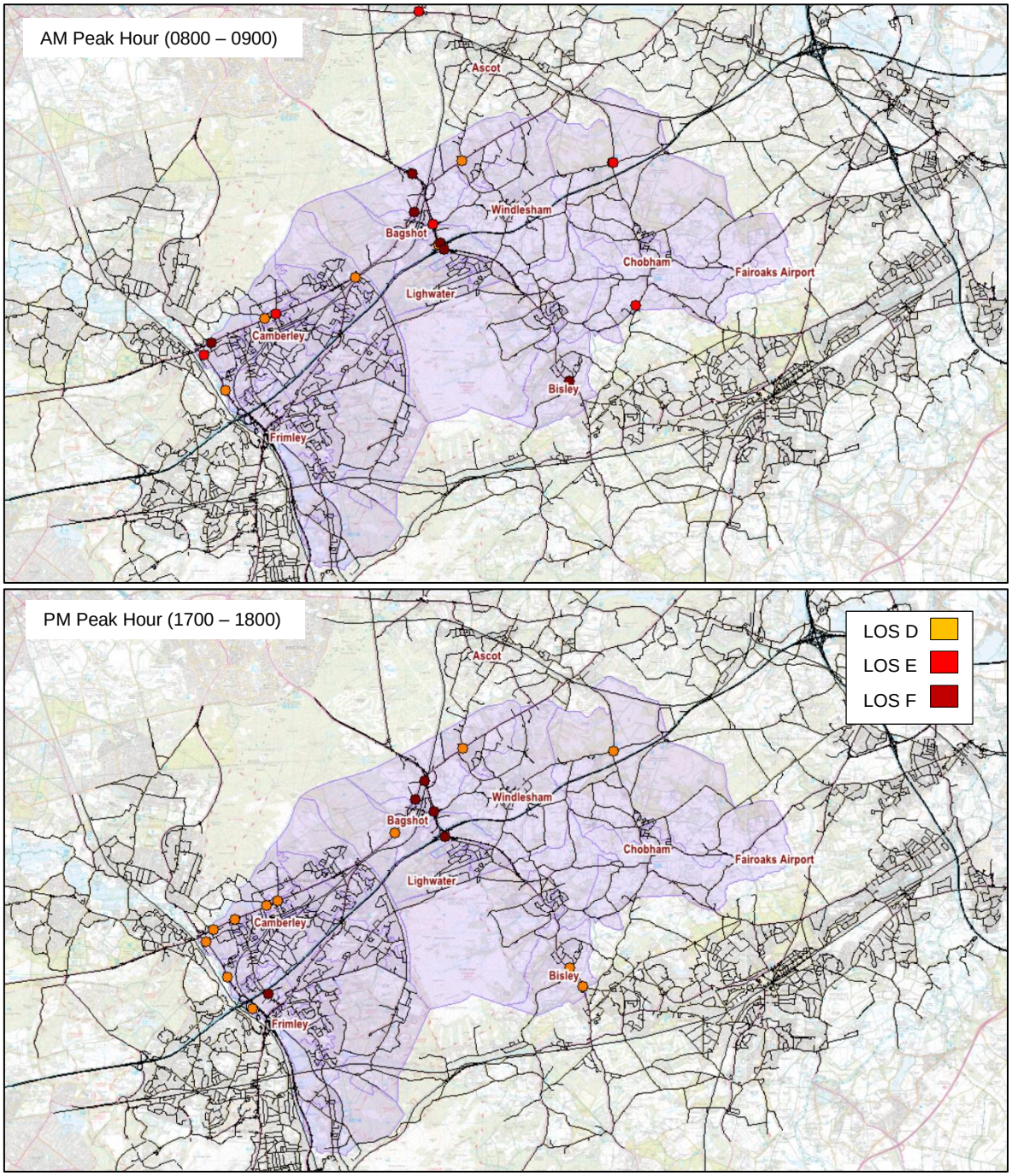
improvement scheme which is being developed for Junction 3 of the M3, which has been put forward for consideration in the Department for Transport's Third Road Investment Strategy. It has not been included in the Do Something Local Plan scenario as it is not committed at the time of writing, but the assessment here further highlights a need for improvement, and to ensure that the design is optimal for the Local Plan scenario.

4.1.8 Junctions with a Level of Service which deteriorate in the Do Something scenario, or which is already at D, E and F are listed below for the PM peak hour:

- A30 Grove End arm of the roundabout junction with A30 London Road, Bagshot (LOS deteriorates from B to C)
- M3 westbound J4 off-slip signalised arm of the grade separated roundabout junction with A331 Blackwater Valley Route, Frimley (LOS maintained at D)
- A331 Blackwater Valley Road signalised junction with Sainsbury's, Camberley (LOS maintained at D)
- A331 Blackwater Valley Road signalised junction with Stanhope Road, York Town (LOS maintained at D)
- A30 London Road signalised junction with Laundry Lane, Camberley (LOS maintained at D)
- A30 London Road signalised junction with B3411 Frimley Road, Camberley (LOS maintained at D)
- A30 London Road junction with Staff College Road, Camberley (LOS maintained at D)
- A30 London Road signalised junction with King's Ride and Knoll Road, Camberley (LOS maintained at D)
- A322 Guildford Road signalised junction with Limecroft Road, Bisley (LOS maintained at D)
- B3020 Sunninghill Road signalised junction with A30 London Road (LOS maintained at D)
- B386 Chertsey Road east arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham (LOS maintained at D)
- A322 Guildford Road signalised junction with Clew's Lane and Queen's Road, Bisley (LOS maintained at D)
- A30 Jenkins Hill signalised junction with Waterers Way, Bagshot (LOS maintained at D)
- Gilbert Road priority junction with B3411 Frimley Road, Frimley (LOS maintained at F)
- A30 London Road signalised junction with Bridge Road, Bagshot (LOS maintained at F)
- A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater (LOS maintained at F)
- A322 Bracknell Road signalised junction with B3029 Guildford Road, Bagshot (LOS maintained at F)
- A30 London Road southbound off-slip priority junction to northbound A322 Bracknell Road (LOS maintained at F)

4.1.9 From the list of junctions above, the junction with the largest increase in delay is the A30 London Road signalised junction with Bridge Road in Bagshot. This increases by 14 seconds per vehicle in the Do Something Local Plan scenario. The next largest increase is 6 seconds at the A322 Bracknell Road signalised junction with B3029 Guildford Road, also in Bagshot. All the other junctions have an increase of 3 seconds or less per vehicle and are considered to be of minimal impact. A change of 3 seconds or less is likely to be within the day-to-day variation.

Figure 4-2 Do Something junctions where the Level of Service (LOS) either deteriorates, or is maintained at D, E, or F. Surrey Heath's boundary is illustrated by the purple border.



5 MOTORWAYS

5.1 Flow Difference on Motorways

5.1.1 Surrey Heath Borough includes Junctions 3 and 4 of the M3 motorway which are the responsibility of National Highways and are reported on separately in this section.

5.1.2 Table 5-1 and Table 5-2 present the motorway flows for the weekday AM and PM peak hours respectively, and flow differences are also presented graphically in Figure 5-1 through to Figure 5-4. Overall, flow differences between the Do Minimum (DM) and Local Plan Something (DS) scenarios are very small.

5.1.3 On the mainline, the maximum increase in the AM peak hour is just 10 PCU between Junctions 4 and 4a on the westbound carriageway, and in the PM peak hour the largest increase is 30 PCU between Junctions 2 and 3 also on the westbound carriageway.

5.1.4 The largest absolute increase across the whole section of motorway is 89 PCU for the junction 3 eastbound on-slip, followed closely by Junction 3 eastbound off-slip, at 87 PCU, during the AM peak hour. These are increases of 4.4% and 5.7% respectively and most of the increase (around 80 PCU) is due to vehicles travelling via the eastbound slip roads in the model instead of remaining on the mainline due to it operating at high capacity. However, this phenomenon is unlikely to happen in real life. This increase in flow on the junction 3 off-slip has caused the Level of Service (LOS) to deteriorate from A (free-flow) to B (stable flow). For link-based Level of Service categorisations, please see Table 3-1.

5.1.5 As seen in Figure 5-4, in the PM peak hour there is a 30 PCU increase to the westbound flow approaching the junction. This changes to a 46 PCU increase for the mainline underneath the junction, because of less vehicles exiting the M3 using the westbound off slip. However, due to less vehicles joining the M3 using the westbound on slip, this surplus of 46 PCU decreases to only 11 PCU after the junction. These increased flows represent an increase of less than 1% and is not expected to affect significantly the functioning of the motorway or Junction 3.

Table 5-1 AM peak hour motorway flow summary table in PCU

Road	Flow		Diff	% Diff	LOS		LOS Diff
	DM	DS			DM	LP	
M3 Eastbound							
M3 J4a - J4 Mainline	6,900	6,899	-1	0.0%	C	C	No
M3 J4 Off-Slip	1,592	1,593	1	0.0%	A	A	No
M3 J4 On-Slip	2,373	2,378	5	0.2%	B	B	No
M3 J4 - J3 Mainline	7,680	7,684	4	0.0%	D	D	No
M3 J3 Off-Slip	1,516	1,602	87	5.7%	A	A	No
M3 J3 On-Slip	2,006	2,095	89	4.4%	A	B	Yes
M3 J3 - J2 Mainline	8,170	8,177	6	0.1%	D	D	No
M3 Westbound							
M3 J4a - J4 Mainline	5,336	5,346	10	0.2%	B	B	No
M3 J4 On-Slip	1,008	1,014	6	0.6%	A	A	No
M3 J4 Off-Slip	1,907	1,905	-2	-0.1%	A	A	No
M3 J4 - J3 Mainline	6,235	6,237	2	0.0%	B	B	No
M3 J3 On-Slip	484	484	0	0.0%	A	A	No
M3 J3 Off-Slip	1,489	1,487	-2	-0.1%	A	A	No
M3 J3 - J2 Mainline	7,240	7,240	0	0.0%	C	C	No

Table 5-2 PM peak hour motorway flow summary table in PCU

Road	Flow		Diff	% Diff	LOS		LOS Diff
	DM	DS			DM	LP	
M3 Eastbound							
M3 J4a - J4 Mainline	6,082	6,085	3	0.0%	B	B	No
M3 J4 Off-Slip	1,333	1,335	2	0.2%	A	A	No
M3 J4 On-Slip	2,186	2,194	8	0.4%	B	B	No
M3 J4 - J3 Mainline	6,935	6,944	8	0.1%	C	C	No
M3 J3 Off-Slip	791	786	-5	-0.7%	A	A	No
M3 J3 On-Slip	1,331	1,318	-13	-1.0%	A	A	No
M3 J3 - J2 Mainline	7,476	7,476	1	0.0%	C	C	No
M3 Westbound							
M3 J4a - J4 Mainline	6,322	6,326	4	0.1%	B	B	No
M3 J4 On-Slip	1,443	1,441	-2	-0.1%	A	A	No
M3 J4 Off-Slip	2,202	2,208	5	0.2%	B	B	No
M3 J4 - J3 Mainline	7,081	7,092	11	0.2%	C	C	No
M3 J3 On-Slip	1,134	1,100	-35	-3.0%	B	B	No
M3 J3 Off-Slip	1,947	1,931	-15	-0.8%	A	A	No
M3 J3 - J2 Mainline	7,893	7,924	30	0.4%	D	D	No

Figure 5-1 Motorway flow difference between the Do Something compared to the Do Minimum for the AM peak hour (0800 – 0900) at the M3 Junction 4

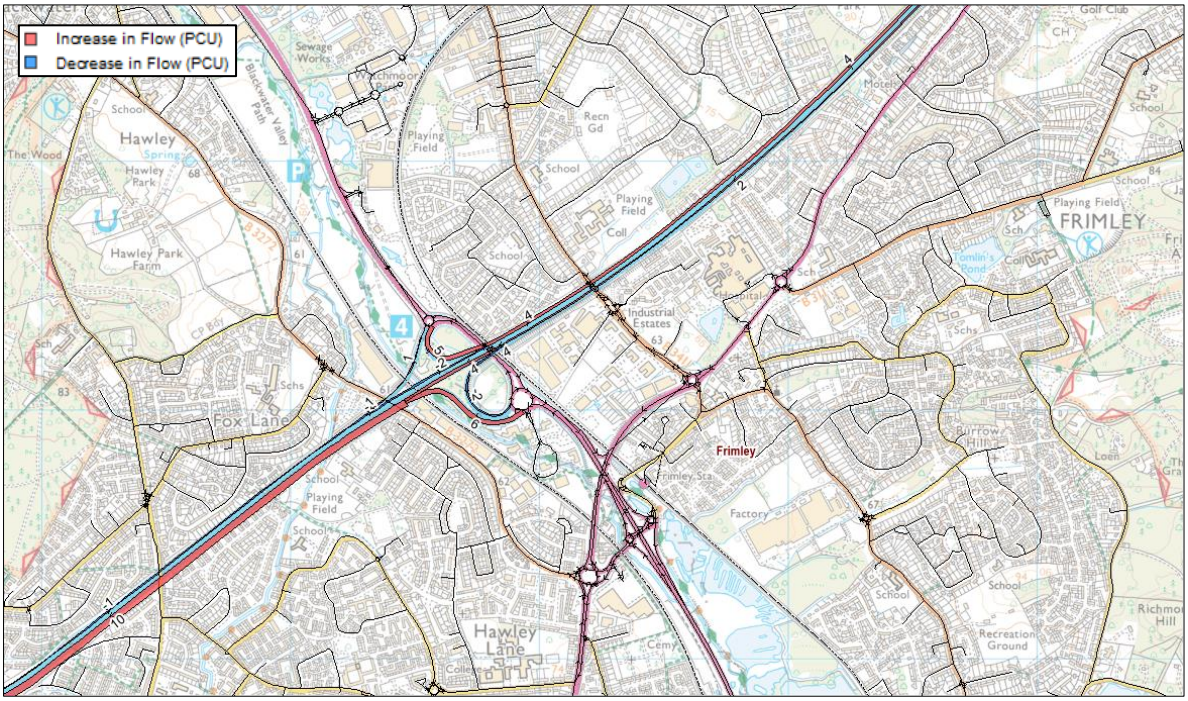


Figure 5-2 Motorway flow difference between the Do Something compared to the Do Minimum for the AM peak hour (0800 – 0900) at the M3 Junction 3

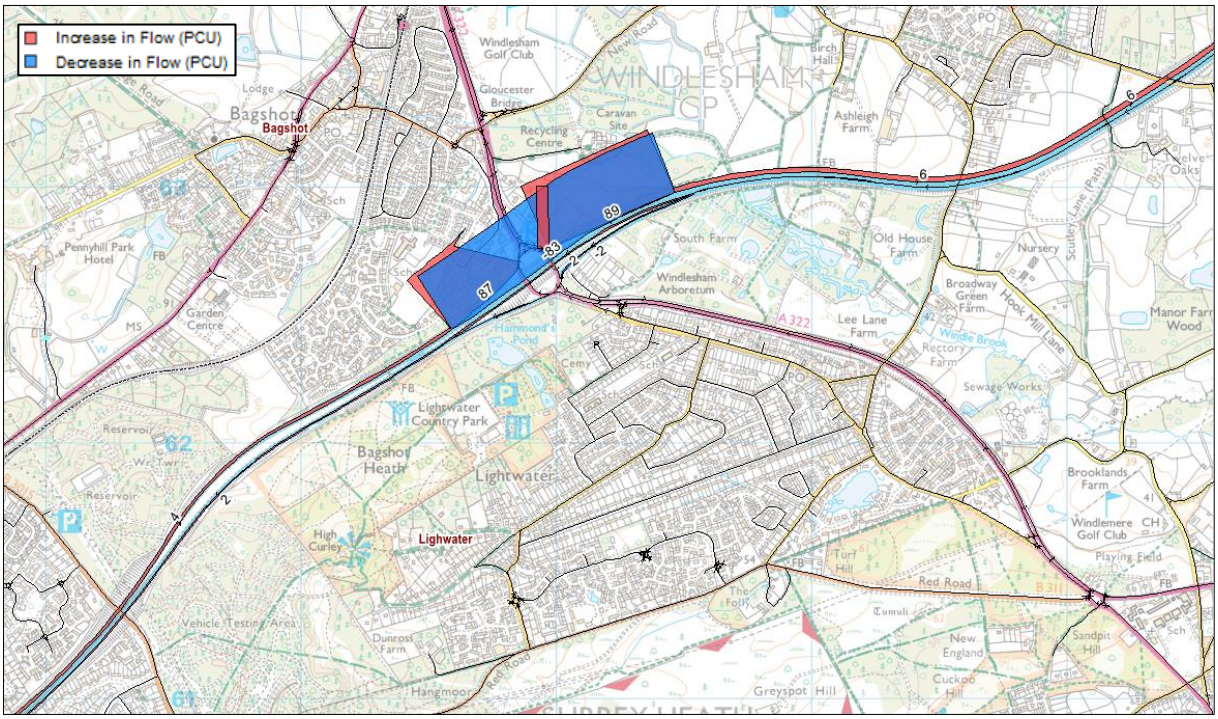


Figure 5-3 Motorway flow difference between the Do Something compared to the Do Minimum for the PM peak hour (1700 – 1800) at the M3 Junction 4

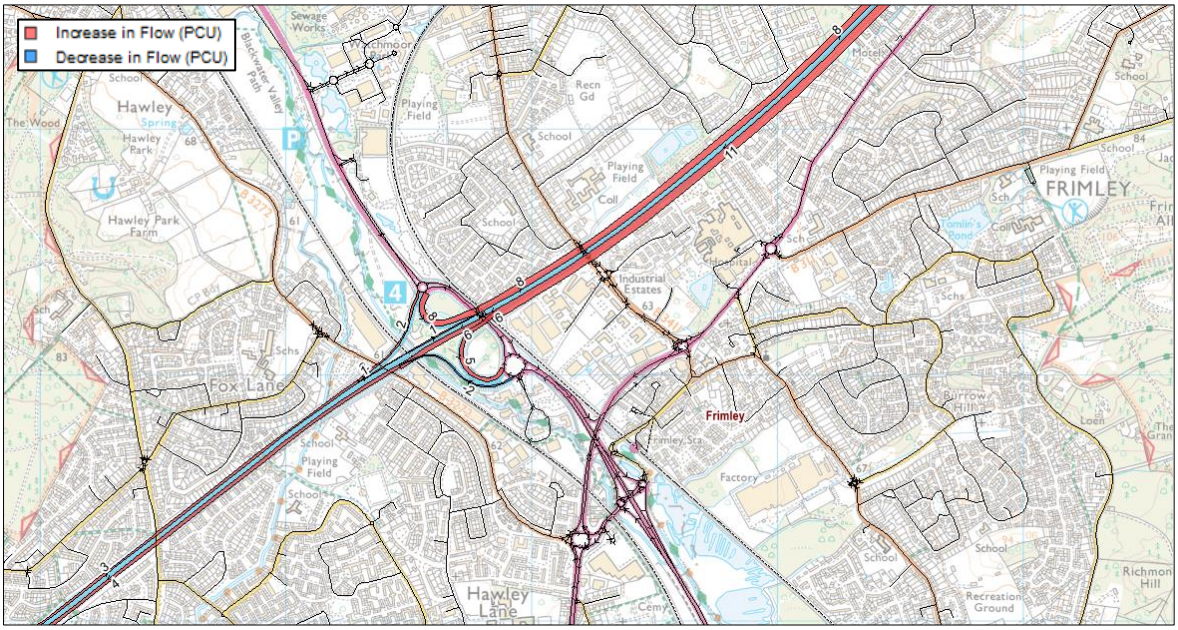
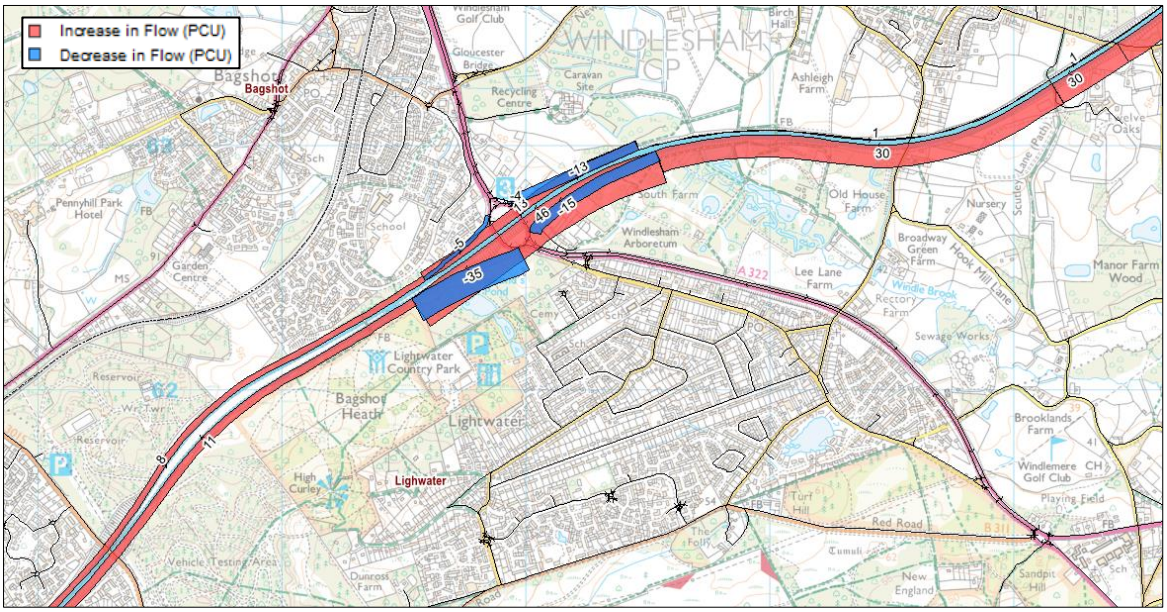


Figure 5-4 Motorway flow difference between the Do Something compared to the Do Minimum for the PM peak hour (1700 – 1800) at the M3 Junction 3



5.2 Merge Delay

5.2.1 The delay at merges has been calculated in the model using the formula specified in Appendix D.9 Merge Modelling on High Speed Road of the Department for Transport's TAG Unit M3.1 Highway Assignment Modelling. The result of which is added to the calculated link generalised cost used in assignment[3].

[3] More detail regarding this method is provided in *TN5: SINTRAM Model Technical Report*

5.2.2 Table 5-3 presents the calculated merge delay for M3 Junctions 3 and 4 on-slips for the weekday AM and PM peak hours. The additional merge delay only applies if the ratio of flow to capacity (RFC) of the downstream mainline is greater than 0.75, otherwise a value of 0 is presented.

5.2.3 As shown in Table 5-3, the largest change to merge delay between the 2038 Do Minimum (DM) and Local Plan Do Something (DS) scenarios is on the Junction 3 westbound on-slip. This is an increase of just 0.6 seconds, which is a 2 percent change. There are no other changes to merge delay for the M3 junctions within Surrey Heath.

Table 5-3 Additional merge delay (seconds per vehicle) for the AM and PM peak hours

Road	Extra Delay in Seconds		Diff	% Diff
	DM	DS		
AM Peak Hour				
Junction 4 Eastbound On-Slip	117.0	117.0	0.0	0%
Junction 4 Westbound On-Slip	0.0	0.0	0.0	0%
Junction 3 Eastbound On-Slip	58.8	58.8	0.0	0%
Junction 3 Westbound On-Slip	5.4	5.4	0.0	0%
PM Peak Hour				
Junction 4 Eastbound On-Slip	86.4	86.4	0.0	0%
Junction 4 Westbound On-Slip	10.8	10.8	0.0	0%
Junction 3 Eastbound On-Slip	36.6	36.6	0.0	0%
Junction 3 Westbound On-Slip	31.2	31.8	0.6	2%

5.3 Merge / Diverge Assessment

5.3.1 A merge / diverge assessment has been undertaken looking at the existing merge and diverge layouts at M3 Junctions 3 and 4 against the flows in all scenarios. It has been presented for the Do Minimum (DM) scenario only as flow changes in the Local Plan Do Something (DS) scenario above are minimal. The assessment is based on the Design manual for Roads and Bridges (DMRB), CD 122 Geometric design of grade separated junctions.

5.3.2 For reference, types of merge and diverge referred to are listed below in Table 5-4, and diagrams showing the layouts are contained in Appendix I.

Table 5-4 Merge and diverge layout descriptions

Merge		Diverge	
Layout	**Description**	**Layout**	**Description**
A Option 1	Taper merge	A Option 1	Taper diverge
A Option 2	2 lane taper merge	A option 2	Single lane auxiliary diverge
B	Parallel merge	B Option 1	Ghost island diverge
C	Ghost island merge	B option 2	Two lane auxiliary diverge
D	Lane gain	C	Lane drop
E Option 1	Lane gain with ghost island offside merge	D Option 1	Ghost island lane drop
E Option 2	Lane gain with ghost island nearside merge	D Option 2	Auxiliary lane drop
xF	2 lane gain with ghost island	E	2 lane drop
G Option 1	Mainline lane gain and double ghost island merge	F	Mainline lane drop and ghost island diverge
H	Mainline two lane gain and ghost island merge		

5.3.3 In order to undertake the assessment, merge / diverge flows and mainline flows are read off a chart which then displays what type of layout should be used together with the number of lanes. A merge layout that offers less capacity than the worst-case peak flow cannot be used e.g., a Layout C instead of Layout F. The layout should cater for the worst-case peak flow and as such should be selected for the highest flow situation. For this reason, the AM and PM peak hours should both be evaluated, and a layout chosen for the worst-case flow of the two time periods. Table 5-5 and Table 5-6 show the suggested layouts for both time periods for M3 Junctions 3 and 4, respectively. Where a letter is shown in brackets, this indicates that the flows fall in an area on the chart close to the border between two layouts.

Table 5-5 Merge / Diverge Assessment suggested layouts for AM and PM peak hours, for M3 junction 3

M3 J3		Eastbound		Westbound	
		Diverge	**Merge**	**Diverge**	**Merge**
AM Peak Hour					
Current type on-street	Type	D op 2	E op 1	C op 2	D
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	4
2038 DM	Type	B (A)	E	B	A
	Upstream lanes	4	4	4	4
	Downstream lanes	4	5	4	4
PM Peak Hour					
Current type on-street	Type	D op 2	E op 1	C op 2	D
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	4
2038 DM	Type	A	B	D	B
	Upstream lanes	4	4	5	4
	Downstream lanes	4	4	4	4

Table 5-6 Merge / Diverge Assessment suggested layouts for AM and PM peak hours, for M3 junction 4

M3 J4		Eastbound		Westbound	
		Diverge	**Merge**	**Diverge**	**Merge**
AM Peak Hour					
Current type on-street	Type	C op 2	E op 1	E op 1	E op 1
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	4
2038 DM	Type	D	E (F)	D	B
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	3
PM Peak Hour					
Current type on-street	Type	C op 2	E op 1	E op 1	E op 1
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	4
2038 DM	Type	C	E	D	E
	Upstream lanes	4	3	4	3
	Downstream lanes	3	4	3	4

5.3.4 Table 5-5 and Table 5-6 show that in the Do Minimum (DM) scenario, there are likely to be demand issues with both M3 Junctions 3 and 4. Regarding Junction 3, the only slip road which is deemed to have a capacity too limited for predicted 2038 demand is the westbound diverge. Here, a type D diverge is estimated to be required in the PM peak, however in the current configuration, a type C (option 2) is present. In addition to this, both upstream and downstream on the mainline are deemed require an additional lane. It is therefore very likely that by 2038, if no changes are made to the existing infrastructure, the diverge at Junction 3 will struggle to cope with demand. However, the impact of this Local Plan is unlikely to have a significant impact on the demand at this diverge, for example there is only a 0.4% increase in flow approaching the diverge (westbound), and there is a decrease of flow using the off-slip, when comparing the Do Minimum with the Do Something Local Plan demand. Therefore, this pre-existing issue is unlikely to be aggravated by the implementation of this Local Plan.

5.3.5 In addition to the westbound diverge layout of junction 3 being unsuitable for the 2038 Do Minimum scenario, the westbound merge and eastbound diverge and merge of Junction 3 are also potentially unsuitable. Junction 3 eastbound diverge is likely to require 4 lanes downstream of the point of divergence in both AM and PM peak hours, while currently only 3 are present.

5.3.6 For Junction 3's eastbound merge, although the merge type is suitable, the number of upstream and downstream lanes is one fewer than is required, with 4 currently in place as opposed to the required 5 downstream of the merge, and 3 currently in place as opposed to the 4 required upstream. This could lead to congestion before and after the merge, leading to increased merge delay.

5.3.7 Junction 4 is better able to cope with demand from the 2038 Do Minimum scenario. All merges and diverges are likely to be able to manage demand from this future scenario, apart from the eastbound diverge (type C), which is unsuitable for AM peak period demand and likely to require a type D diverge. This may result in congestion if the layout is not altered, however it is again unlikely that the relatively minor impact of the additional demand caused by the local plan will notably affect this situation, as there is only predicted to be an additional 2 PCU of flow using the J4 eastbound on-slip, an increase of 0.2%.

6 CROSS BOUNDARY IMPACTS

6.1.1 Traffic flows on A principal and B roads which cross into neighbouring authorities have been analysed and compared. Table 6-1 presents the flows entering and Table 6-2 presents the flows exiting the borough for the weekday AM peak hour; whilst equivalent data is presented in Table 6-3 and Table 6-4 for the PM peak hour. The roads have been listed in a clockwise direction.

6.1.2 Any change in flow in comparison with Do Minimum at the borough's boundary is relatively small during both time periods with no changes in flow of greater than 28 PCU.

6.1.3 The routes with the largest increase in flow are:

- AM peak hour – A322 Bracknell Road which borders Bracknell Forest and sees an increase of 6 PCU travelling into Surrey Heath, and an increase of 28 PCU in the opposite direction.
- PM peak hour – A3046 Chobham Road which borders Woking and sees an increase of 16 PCU in both directions of travel.

6.1.4 There are no cross-boundary roads that experience an increase in flow greater than 5% in either the AM or PM peak hours. The largest percentage increase is a 3% increase of flows, and this level of increase includes multiple roads. These are:

- B3012 Guildford Road in the AM peak hour travelling into Guildford
- A322 Guildford Road in the PM peak hour travelling from Woking

6.1.5 There are also some reductions in flow compared with the Do Minimum Scenario at the borough boundary. These are all minor decreases of flow and less common than increases.

Table 6-1 AM Peak hour traffic flow summary in PCU for A Principal and B Roads which enter the Surrey Heath boundary from neighbouring authorities

Road	Boundary with	DM	DS	Diff	% Diff
Vehicles Entering Surrey Heath					
A30 London Road	Hart	919	914	-5	-1%
A321 Marshall Road	Bracknell Forest	701	698	-3	0%
A322 Bracknell Road	Bracknell Forest	3,503	3,509	6	0%
B3020 Sunninghill Road	Windsor and Maidenhead	395	384	-11	-3%
A30 London Road	Windsor and Maidenhead	552	554	2	0%
B383 Chobham Road	Windsor and Maidenhead	874	871	-3	0%
B386 Longcross Road	Runnymede	583	586	3	1%
A319 Chertsey Road	Runnymede	349	350	1	0%
A3046 Chobham Road	Woking	1,197	1,193	-4	0%
A322 Guildford Road	Woking	121	119	-1	-1%
B3012 Guildford Road	Guildford	136	132	-4	-3%
B3411 Mychett Road	Guildford	788	786	-2	0%
A325 access road to A331	Rushmoor	1,177	1,187	10	1%
A325 Farnborough Road	Rushmoor	870	869	-1	0%
A331 Blackwater Valley Route	Rushmoor	2,493	2,487	-6	0%

Table 6-2 AM Peak hour traffic flow summary in PCU for A Principal and B Roads which exit the Surrey Heath boundary into neighbouring authorities

Road	Boundary with	DM	DS	Diff	% Diff
Vehicles Exiting Surrey Heath					
A30 London Road	Hart	564	573	9	2%
A321 Marshall Road	Bracknell Forest	550	558	8	1%
A322 Bracknell Road	Bracknell Forest	2,881	2,909	28	1%
B3020 Sunninghill Road	Windsor and Maidenhead	630	637	7	1%
A30 London Road	Windsor and Maidenhead	1,060	1,057	-3	0%
B383 Chobham Road	Windsor and Maidenhead	880	883	3	0%
B386 Longcross Road	Runnymede	1,038	1,055	17	2%
A319 Chertsey Road	Runnymede	781	789	8	1%
A3046 Chobham Road	Woking	1,076	1,086	10	1%
A322 Guildford Road	Woking	233	236	2	1%
B3012 Guildford Road	Guildford	287	296	10	3%
B3411 Mychett Road	Guildford	694	704	10	1%
A325 access road to A331	Rushmoor	1,233	1,235	2	0%
A325 Farnborough Road	Rushmoor	1,178	1,195	16	1%
A331 Blackwater Valley Route	Rushmoor	1,947	1,957	10	1%

Table 6-3 PM Peak hour traffic flow summary in PCU for A Principal and B Roads which enter the Surrey Heath boundary from neighbouring authorities

Road	Boundary with	DM	DS	Diff	% Diff
Vehicles Entering Surrey Heath					
A30 London Road	Hart	627	627	1	0%
A321 Marshall Road	Bracknell Forest	312	313	0	0%
A322 Bracknell Road	Bracknell Forest	2,433	2,449	16	1%
B3020 Sunninghill Road	Windsor and Maidenhead	517	518	2	0%
A30 London Road	Windsor and Maidenhead	570	584	13	2%
B383 Chobham Road	Windsor and Maidenhead	535	544	10	2%
B386 Longcross Road	Runnymede	881	881	0	0%
A319 Chertsey Road	Runnymede	739	745	6	1%
A3046 Chobham Road	Woking	976	992	16	2%
A322 Guildford Road	Woking	271	280	9	3%
B3012 Guildford Road	Guildford	143	142	-1	-1%
B3411 Mychett Road	Guildford	480	490	9	2%
A325 access road to A331	Rushmoor	1,199	1,207	8	1%
A325 Farnborough Road	Rushmoor	828	841	13	2%
A331 Blackwater Valley Route	Rushmoor	2,264	2,273	9	0%

Table 6-4 PM Peak hour traffic flow summary in PCU for A Principal and B Roads which exit the Surrey Heath boundary into neighbouring authorities

Road	Boundary with	DM	DS	Diff	% Diff
Vehicles Exiting Surrey Heath					
A30 London Road	Hart	759	750	-10	-1%
A321 Marshall Road	Bracknell Forest	1,057	1,053	-5	0%
A322 Bracknell Road	Bracknell Forest	2,960	2,969	9	0%
B3020 Sunninghill Road	Windsor and Maidenhead	291	286	-5	-2%
A30 London Road	Windsor and Maidenhead	549	557	9	2%
B383 Chobham Road	Windsor and Maidenhead	634	638	3	1%
B386 Longcross Road	Runnymede	534	535	1	0%
A319 Chertsey Road	Runnymede	497	495	-2	0%
A3046 Chobham Road	Woking	782	798	16	2%
A322 Guildford Road	Woking	212	210	-2	-1%
B3012 Guildford Road	Guildford	87	87	0	0%
B3411 Mychett Road	Guildford	710	715	4	1%
A325 access road to A331	Rushmoor	1,259	1,260	2	0%
A325 Farnborough Road	Rushmoor	1,445	1,454	9	1%
A331 Blackwater Valley Route	Rushmoor	2,348	2,345	-3	0%

6.1.6 Table 6-5 presents the Level of Service (LOS) entering and Table 6-6 presents the LOS exiting the borough in both the AM and PM peak hours. The roads have been listed in a clockwise direction.

6.1.7 When comparing the LOS in the Do Something with the Do Minimum Scenario, the changes of flow have only led to two changes in LOS on cross-boundary A and B roads. The following roads have both deteriorated by one LOS band, which has been caused by a very small increase in PCU.

- A319 Chertsey Road travelling from Runnymede in the PM peak hour. The LOS for this road changes from A to B and is due to an increase of 6 PCU.

- A325 access road to A331 travelling from Rushmoor in the PM peak hour. The LOS for this road changes from C to D. This indicates the road is near capacity but is caused by an increase of 8 PCU. This means that the road being near capacity is largely an already existing problem, and the effect of the Local Plan, although increasing LOS, is minimal.

6.1.8 The following cross-boundary routes have a poor level of service (C or D), but this is maintained in every scenario indicating that the Local Plan development is not having an impact on these routes:

- A322 Bracknell Road travelling from Bracknell Forest in the AM peak hour
- A3046 Chobham Road travelling from the Royal Borough of Windsor and Maidenhead in the AM peak hour
- A325 access road to A331 travelling both in and out of Rushmoor in the AM peak hour, and entering Rushmoor in the PM peak hour
- A30 London Road entering Hart in the AM peak hour
- A325 Farnborough Road travelling from Rushmoor in the PM peak hour

Table 6-5 Level of Service (LOS) summary for A Principal and B Roads which enter the Surrey Heath boundary from neighbouring authorities

Road	Boundary with	AM Peak Hour			PM Peak Hour		
		DM	DS	Change in LOS?	DM	DS	Change in LOS?
Vehicles Entering Surrey Heath							
A30 London Road	Hart	B	B	No	A	A	No
A321 Marshall Road	Bracknell Forest	A	A	No	A	A	No
A322 Bracknell Road	Bracknell Forest	C	C	No	B	B	No
B3020 Sunninghill Road	Windsor and Maidenhead	A	A	No	A	A	No
A30 London Road	Windsor and Maidenhead	A	A	No	A	A	No
B383 Chobham Road	Windsor and Maidenhead	A	A	No	A	A	No
B386 Longcross Road	Runnymede	A	A	No	B	B	No
A319 Chertsey Road	Runnymede	A	A	No	A	B	Yes
A3046 Chobham Road	Woking	C	C	No	B	B	No
A322 Guildford Road	Woking	A	A	No	A	A	No
B3012 Guildford Road	Guildford	A	A	No	A	A	No
B3411 Mychett Road	Guildford	B	B	No	A	A	No
A325 access road to A331	Rushmoor	C	C	No	C	D	Yes
A325 Farnborough Road	Rushmoor	A	A	No	A	A	No
A331 Blackwater Valley Route	Rushmoor	B	B	No	B	B	No

Table 6-6 Level of Service (LOS) summary for A Principal and B Roads which exit the Surrey Heath boundary into neighbouring authorities

Road	Boundary with	AM Peak Hour			PM Peak Hour		
		DM	DS	Change in LOS?	DM	DS	Change in LOS?
Vehicles Exiting Surrey Heath							
A30 London Road	Hart	A	A	No	A	A	No
A321 Marshall Road	Bracknell Forest	A	A	No	A	A	No
A322 Bracknell Road	Bracknell Forest	B	B	No	B	B	No
B3020 Sunninghill Road	Windsor and Maidenhead	A	A	No	A	A	No
A30 London Road	Windsor and Maidenhead	C	C	No	A	A	No
B383 Chobham Road	Windsor and Maidenhead	A	A	No	A	A	No
B386 Longcross Road	Runnymede	B	B	No	A	A	No
A319 Chertsey Road	Runnymede	B	B	No	A	A	No
A3046 Chobham Road	Woking	B	B	No	B	B	No
A322 Guildford Road	Woking	A	A	No	A	A	No
B3012 Guildford Road	Guildford	A	A	No	A	A	No
B3411 Mychett Road	Guildford	B	B	No	B	B	No
A325 access road to A331	Rushmoor	D	D	No	D	D	No
A325 Farnborough Road	Rushmoor	B	B	No	C	C	No
A331 Blackwater Valley Route	Rushmoor	A	A	No	B	B	No

7 HOTSPOTS / MITIGATION POTENTIAL

7.1.1 In this section, areas which have been highlighted elsewhere in the report as being impacted by the Local Plan allocation sites or requiring further assessment are listed. Note that it is not expected that hard engineering measures will be required to mitigate Local Plan development at all these sites. Well-planned, high-quality walking and cycling links to enhance this and have the greatest potential to reduce travel by private car and therefore reduce any impacts.

7.1.2 Surrey Heath is already a busy borough in terms of movement and motorised traffic, and, therefore, it can be expected that additional development will increase journey times and congestion. However, as noted above, by focussing on reducing vehicular trips rates by facilitating active travel and having amenities such as shops and schools within walk and cycle distance can help to mitigate negative effects. Such investment should not be just in the immediate vicinity of developments but either whole route or corridor improvements, along with other elements such as secure cycle parking facilities both within new homes and at main destination points.

7.2 Links

7.2.1 The modelling shows that there would be no changes in the level of service along any route recorded. Where changes do occur, these would be tolerable and the impact on links would have more to do with downstream junctions and other activities (for e.g. pedestrian crossings, buses waiting at bus stops, LGVs delivering, etc.) than the capacity of the links themselves.

7.3 Junctions

7.3.1 Table 7-1 below lists the junctions which deteriorate in the Local Plan Do Something (DS) scenario or are operating poorly with a Level of Service (LOS) of D, E or F for

the AM and PM peak hours respectively. Only those where the average delay per vehicle increases in the Local Plan Do Something scenario are listed, and those marked with ** refer to deterioration in the Level of Service category.

Table 7-1 Increase in delay for those junctions which deteriorate in Level of Service (LOS) or are operating poorly in the Local Plan Do Something (DS) scenario

Junction	DS LOS	Change in Delay (seconds per vehicle)
AM Peak Hour		
New Road priority junction with Church Road, Windlesham	C**	6
M3 eastbound J3 off-slip signalised arm of the grade separated roundabout junction with A322, Lightwater	D	3
B386 Chertsey Road west arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham	D	3
Castle Grove Road priority junction with Guildford Road, Chobham	E	3
B383 Chobham Road arm of the roundabout junction with B386 Chertsey Road, Chobham	E	4
A30 London Road signalised junction with Bridge Road, Bagshot	F	3
A322 Bracknell Road signalised arm of the grade separated roundabout junction with M3 J3, Lightwater	F**	40
A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater	F	1
A322 Bracknell Road priority junction with Dukes Covert, Bagshot	F	4
PM Peak Hour		
A30 Grove End arm of the roundabout junction with A30 London Road, Bagshot	C**	3
B386 Chertsey Road east arm of the roundabout junction with B383 Windsor and Chobham Roads, Chobham	D	2
Gilbert Road priority junction with B3411 Frimley Road, Frimley	F	1
A30 London Road signalised junction with Bridge Road, Bagshot	F	14
A322 Lightwater By-Pass arm of the grade separated roundabout junction with M3 J3, Lightwater	F	3
A322 Bracknell Road signalised junction with B3029 Guildford Road, Bagshot	F	6

7.3.2 While delay does increase at the junctions shown in Table 7-1, for the majority the change in delay is tolerable and likely to be within the variation experienced by drivers day-to-day. Thus, the assessment indicates there are not any junctions where specific mitigation is required due to the potential cumulative impacts of the proposed developments.

7.3.3 The exceptions to this are Junction 3 of the M3 in Lightwater which sees an increase of 40 seconds per vehicle on the A322 Bracknell Road approach in the AM peak hour, and A30 London Road signalised junction with Bridge Road in Bagshot which has an increase of 14 seconds per vehicle in the PM peak hour.

7.3.4 As has been noted above, there is a junction improvement scheme which is being developed for Junction 3 of the M3, which has been put forward for consideration in the Department for Transport's Third Road Investment Strategy. It has not been included in the Do Something Local Plan scenario as it is not committed at the time of writing, but the assessment here further highlights a need for improvement, and to ensure that the design is optimal for the Local Plan scenario.

7.4 Strategic Road Network

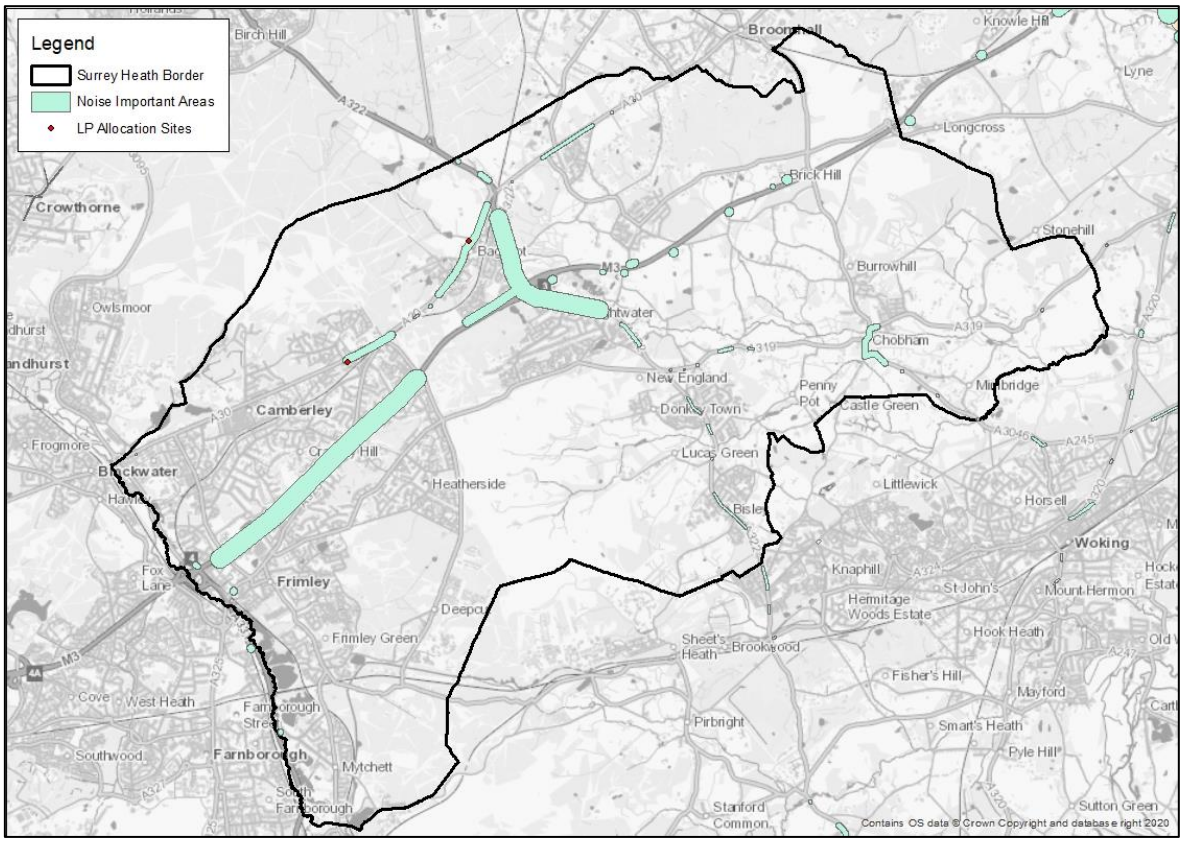
7.4.1 The potential impacts related to the Motorways are considered to be tolerable, particularly as there is no change to the merge delay during both assessed time periods for both M3 Junctions 3 and 4. However, National Highways will need to consider the model outputs and may require further work to be undertaken.

7.5 Noise Important Areas

7.5.1 The following development sites fall within noise important areas[4] and are illustrated in Figure 7-1. Both sites are situated within noise important areas located on the A30. Further consideration may need to be given regarding mitigating noise from both construction and potential motorised vehicular trips generation associated with these sites.

- Tanners Yard, London Road, Bagshot (GU19 5HD); and
- Burwood House Hotel, 15 London Road, Camberley (GU15 3UQ).

Figure 7-1: Surrey Heath local plan allocation sites within noise important areas.



[4] Noise Action Plan (2019): Roads (publishing.service.gov.uk) (Page 17)

8 SUMMARY

8.1.1 The proposed Surrey Heathy Local Plan site allocations have been modelled using Surrey's strategic transport model SINTRAM, and an associated Local Model to assess their impact at the end of the Local Plan period in 2038.

8.1.2 Overall, the developments are reasonably small and dispersed, and the largest sites are located in areas with relatively high amenity, such as the sites in Camberley where shops, jobs and/or access to public transport is a walk away. Furthermore, many sites result in a loss of commercial activity which leads to a lower net increase in vehicle trips. As a result, the impacts tend to be local to the developments and the cumulative impact is in general tolerable. Nevertheless, there are some cumulative impacts in Bagshot and Lightwater. It is not considered that any of the cumulative impacts would be considered severe in terms of the National Planning Policy Framework (NPPF).

8.1.3 There may be a need for localised highway mitigation tied in with specific developments. This is to ensure there are high quality pedestrian and cycle links linking the developments with where people want to travel to in order to limit travel by private vehicle.

8.1.4 Improvement of facilities to accommodate more movement on foot, by bicycle and on public transport may mean that motorised traffic will experience some increase in delay and congestion. As such, care will need to be taken to ensure there is no significant impact on the local environment including air quality.

8.1.5 Surrey County Council's newly adopted Local Transport Plan (LTP4) focuses on the principle of 'avoid, shift and improve' to achieve its objectives of:

- Net zero carbon emissions
- Sustainable growth
- Well-connected communities
- Clean air and excellent quality of life

8.1.6 There is an opportunity at this stage to contribute to avoiding travel by reducing the number and length of trips needed through improved land use and travel planning, as set out in Policy 'Planning for Place'. Establishing 'liveable neighbourhoods' which provide attractive local public spaces and more local community, educational, leisure and other facilities create great places for people to live and maximise their potential, increasing their health, wellbeing, and connection to their communities. Planning places for people and liveability leads to less travel overall and makes travel by non-car modes an easier, more attractive option. More local services within walking and cycling distance can help to reinvigorate local communities and achieve health benefits, whilst benefitting local economies and reducing trip generation of motorised traffic.

8.1.7 The opportunity to implement liveable neighbourhoods is currently being explored for some of the more urban areas of Surrey Heath, subject to funding and community support. These plans are currently in development.

8.1.8 The Local Transport Plan policy 'Active Travel and Personal Mobility' also emphasises the need to support increased use of sustainable forms of travel for local journeys via a new travel hierarchy to prioritise sustainable modes. This is

particularly relevant in town centre locations such as Camberley where walking cycling and public transport should be prioritised over the private car.

8.1.9 A Local Cycling and Walking Infrastructure Plan (LCWIP) is also in development for Surrey Heath. LCWIPS are set out in the Government's Cycling and Walking Investment Strategy[5] and provide a strategic approach to providing walking and cycling improvements at the local level.

[5] Cycling and Walking Investment Strategy (publishing.service.gov.uk)

9 APPENDIX I

Merge / diverge layouts taken from Design manual for Roads and Bridges (DMRB), CD 122 Geometric design of grade separated junctions

Merge

Figure 3.14a Layout A option 1 - taper merge

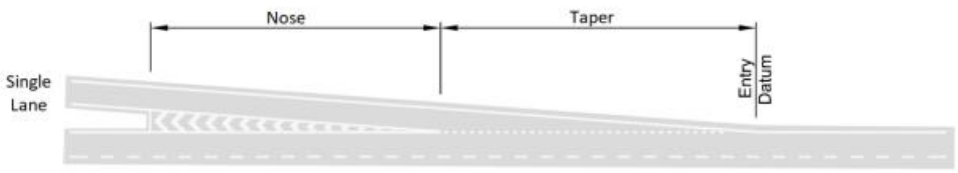


Figure 3.14b Layout A option 2 - 2 lane taper merge

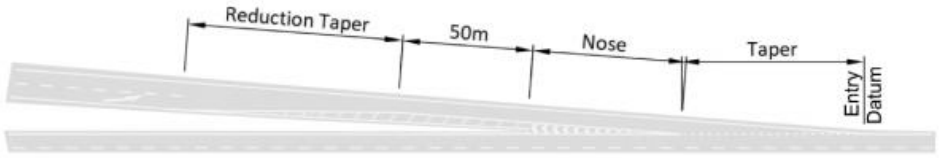


Figure 3.14c Layout B - parallel merge

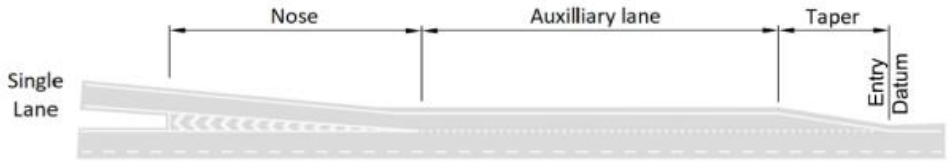


Figure 3.14d Layout C - ghost island merge

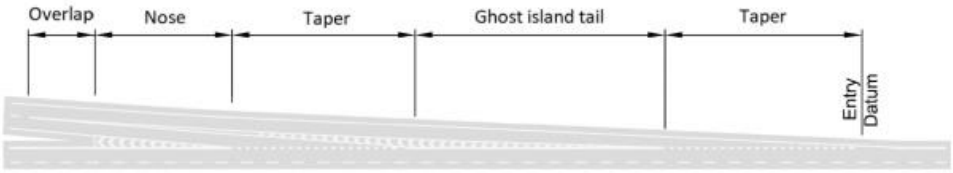


Figure 3.14e Layout D - lane gain

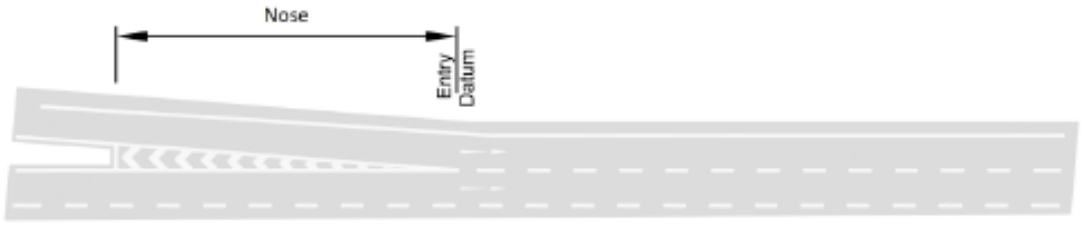


Figure 3.14f Layout E Option 1 - lane gain with ghost island offside merge

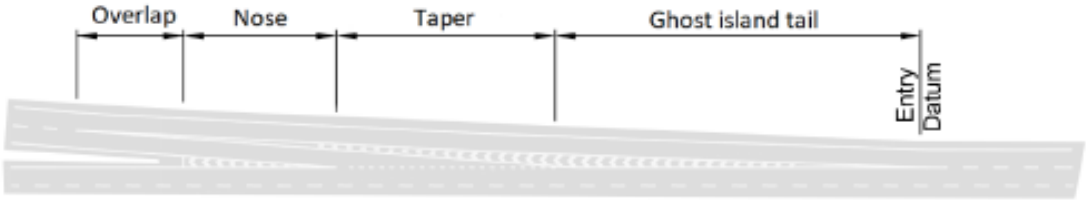


Figure 3.14g Layout E Option 2 - lane gain with ghost island nearside merge

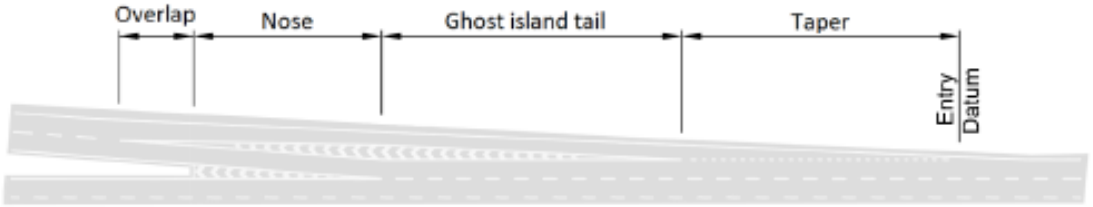


Figure 3.14h Layout F - 2 lane gain with ghost island

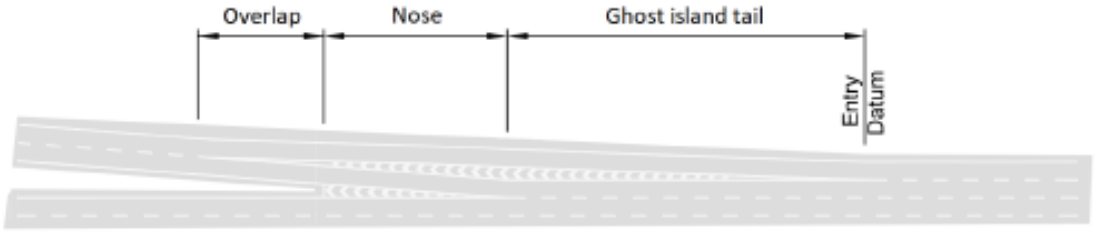


Figure 3.14i Layout G Option 1 - mainline lane gain and double ghost island merge

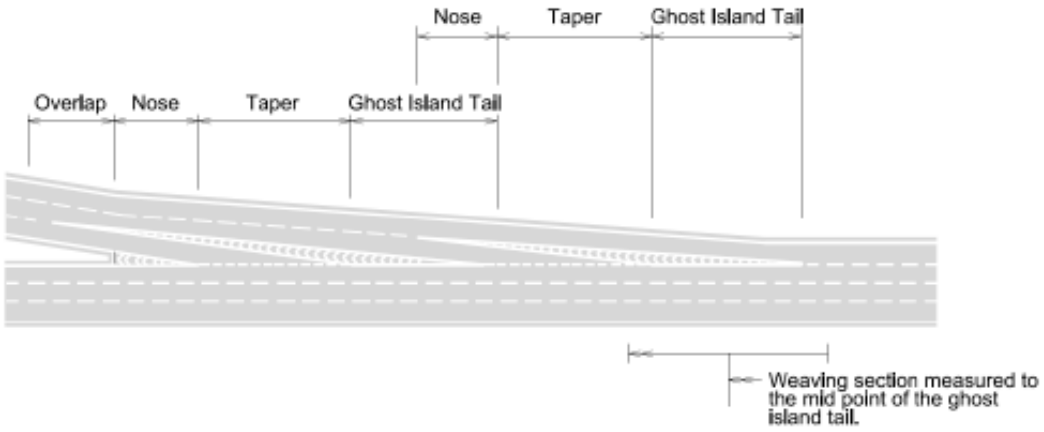


Figure 3.14j Layout G Option 2 - mainline lane gain and single ghost island merge

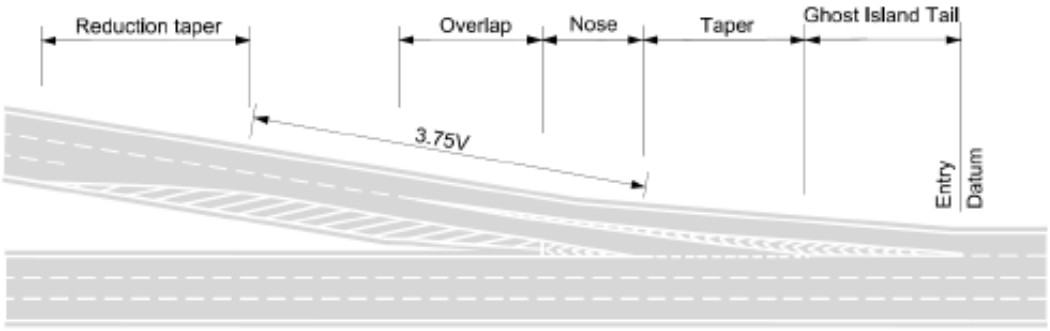
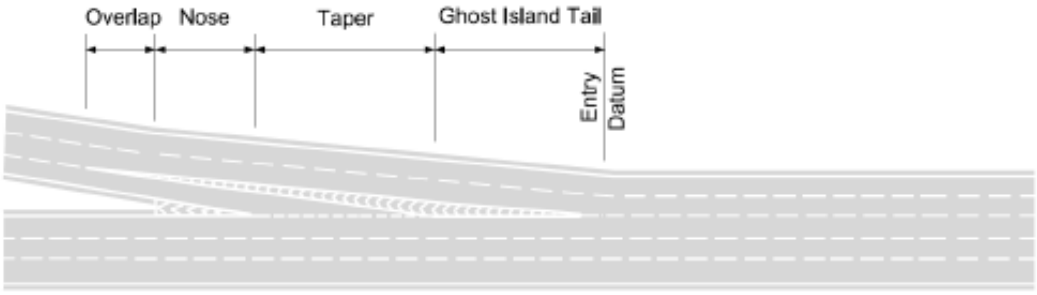


Figure 3.14k Layout H - mainline 2 lane gain and ghost island merge



Diverge

Figure 3.30a Layout A option 1 - taper diverge

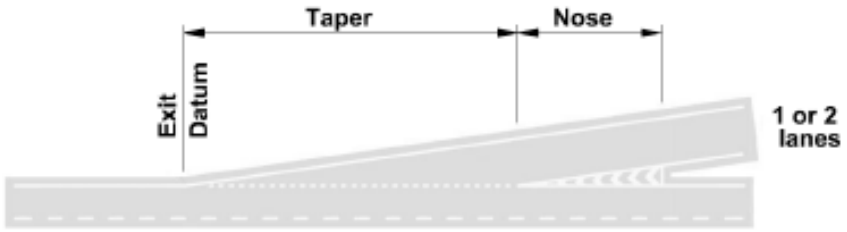


Figure 3.30b Layout A option 2 - Single lane auxillary diverge

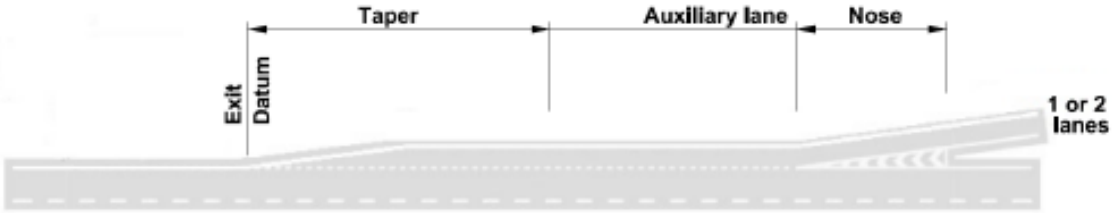


Figure 3.30c Layout B option 1 - ghost island diverge

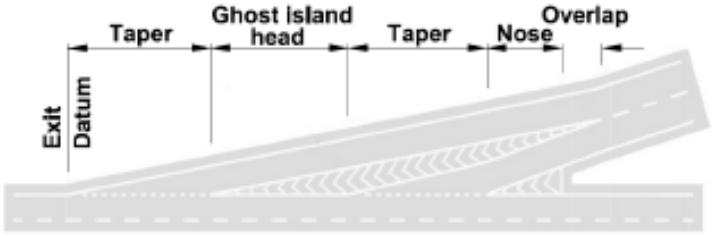


Figure 3.30d Layout B option 2 - Two lane auxillary diverge

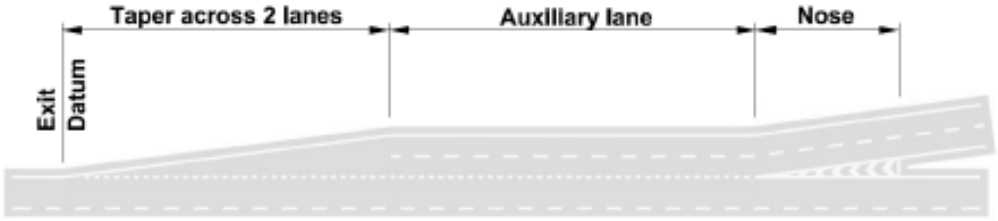


Figure 3.30e Layout C - lane drop

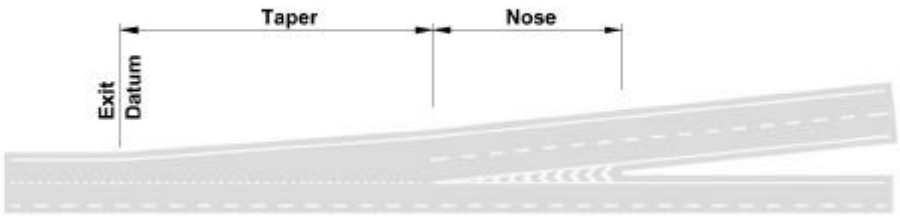


Figure 3.30f Layout D option 1 - ghost island lane drop

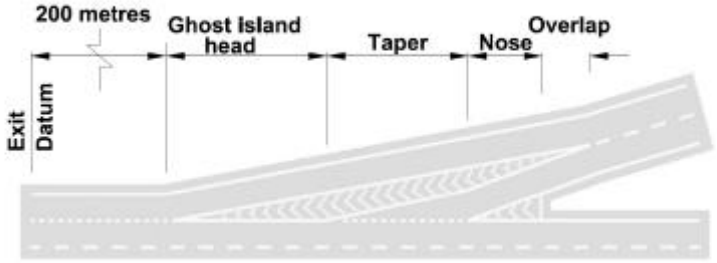


Figure 3.30g Layout D option 2 - auxilliary lane lane drop

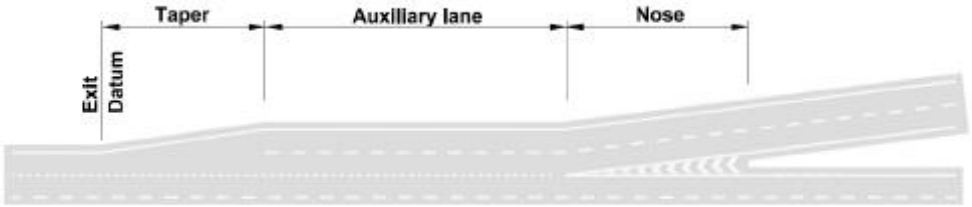


Figure 3.30h Layout E - 2 lane drop

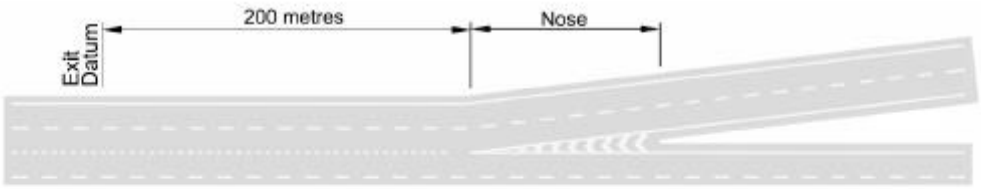


Figure 3.30i Layout F - mainline lane drop and ghost island diverge