

Guildford Borough Council Local Plan

Study of Performance of A3 Trunk Road
Interchanges in Guildford Urban Area to 2024
Under Development Scenarios

December 2017

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Executive summary

Guildford Borough Council (GBC) has prepared a new Local Plan; the Guildford Borough Local Plan: Strategy and Sites. This study responds to issues raised by Highways England with respect to the impact of proposed planned development in the Submission Local Plan on the Guildford section of the A3 trunk road in the period to 2024, the earliest date for the start of construction of the A3 Guildford scheme.

The study considers how the operation of the A3 junctions is predicted to change by 2024 with the addition of traffic demand associated with the Submission Local Plan development and if this is likely to have any impact on the A3. The merge and diverge flows and layouts at each location are also considered. The base case for comparison is taken from traffic counts at the junctions in 2013/14, with background traffic growth to 2024 included, as well as traffic from:

- Developments that have been completed or consented between 2014 and 2017;
- Developments on existing Development Plan Policy compliant land - sites that would be expected to come forward and be completed by 2024 (noting that the existing Development Plan includes saved policies from the 2003 Local Plan and NPPF compliant sites).

Data on the number of houses and areas of other development (housing, office, industrial, retail, etc) for the above categories and for the Submission Local Plan were provided by GBC, together with details of the location of each site. The expected trip distribution for each site was assumed to be as the existing travel to work patterns for the 2011 Census zone (Middle Super Output Area) that the site is in, with different distributions for residential and employment-based trips.

Peak hour trip rates for each development type were applied to give the vehicle trip generations of the three different categories of development to/from each Census zone. Applying the Census travel to work distributions gave predicted traffic volumes from each zone in Guildford Borough to all other areas, both within the Borough and to neighbouring authorities and further afield.

Assumed routes to travel between zones were defined and all trips that would be expected to join the A3, or pass through a junction on the A3, were quantified. Junction capacity testing was then undertaken to assess the impact on the junction operation of adding the Submission Local Plan trips to the 2024 base case.

The testing showed that at the Cathedral (Egerton Road / The Chase) and Dennis (A322 / A25) junctions, the addition of Submission Local Plan trips would give minimal impact on queuing on the A3 off-slip road, with the queue not stretching back onto the A3 main carriageway. At the A3 Stoke (Woking Road) junction, significant queuing already occurs on the off-slip but with Submission Local Plan trips added in 2024, the queue length is shown to increase by only 1-2 vehicles.

At the University (Egerton Road) junction, queuing on the A3 off-slip already backs up onto the A3 main carriageway for one hour or more in the AM peak period. This congestion is a direct result of insufficient capacity at the signalised crossroads immediately west of the A3 slip road roundabout (Tesco roundabout). Testing shows that the queue back from the crossroads would

only increase by less than one vehicle in the AM peak hour with Submission Local Plan trips, so this should not result in a significant increase in queuing on the A3 off-slip.

Improvements to the signalised crossroads and the roundabout are being considered by GBC as part of the Sustainable Movement Corridor between the University/Hospital site and the town centre. These improvements, if implemented, are predicted to prevent queuing from the crossroads stretching back to the roundabout and will also allow better management of traffic from the A3. Testing shows that the queue on the A3 off-slip should no longer extend onto the A3 main carriageway.

The impact of the additional Submission Local Plan traffic on the merge and diverge layouts of the A3 junctions has also been assessed. No changes in the required layout (according to the standard TD22/06 Layout of Grade Separated Junctions) are shown to be required with the Submission Local Plan trips.

The issue of peak spreading on the A3 has been considered. With the low volumes of traffic predicted to use the A3 junctions due to the Submission Local Plan sites, there should be no impact on peak spreading or no need for peak spreading to occur to accommodate these trips.

The overall conclusion of the report is that traffic from the Submission Local Plan allocations would not have a significant detrimental impact on the operation of the A3 through the Guildford urban area. In addition, the proposed improvements at the University junction, if implemented, should have major benefits in preventing queuing on the off-slip extending back onto the A3 northbound main carriageway.

1 Introduction

1.1 Background

- 1.1.1 Guildford Borough Council (GBC) has prepared a new Local Plan; the Guildford Borough Local Plan: Strategy and Sites. GBC most recently consulted on the Guildford Borough Proposed Submission Local Plan: Strategy and Sites (June 2017). The Submission Local Plan outlines the spatial development strategy for the borough up to 2034, including the quantum and location of development. This is based on an assessment of the objectively assessed need for new homes, employment and retail space and an assessment of whether this quantum of development can be provided in a sustainable way following consideration of other policy constraints.
- 1.1.2 The Submission Local Plan is based on the premise that the implementation of the A3 Guildford scheme, as mandated by the Department for Transport's Road Investment Strategy (March 2015) (the "RIS"), is, alongside other identified critical infrastructure, required in order to be able to accommodate future planned development both outside and within the borough. The A3 Guildford scheme is presently subject to feasibility and design development by Highways England (HE), with construction anticipated to commence in Road Period 2 (2020/21 to 2024/25). Highways England has advised GBC that, if an A3 Guildford scheme is approved with funding agreed, construction is unlikely to start until 2024 at the earliest with construction taking 2½ years.
- 1.1.3 GBC has planned positively for the development and infrastructure required in the area, and accordingly is working on the basis that any A3 Guildford scheme will take account of future planned growth including that from Guildford's new Local Plan.
- 1.1.4 In the early years of the Submission Local Plan, the delivery of planned development and the impact of new development traffic on the A3 is likely to be an important ongoing consideration as the trunk road suffers from significant congestion during peak periods. Some relief will be provided by two off-slip lane widening schemes, on the A3 northbound off-slip at the University interchange (approaching Tesco roundabout) (scheme SRN7 in the Submission Local Plan) and the A3 southbound off-slip at the Stoke Interchange (scheme SRN8), to which funding was committed by Government in March 2017, and which are to be delivered by 2019. These two schemes will primarily improve road safety but also provide some congestion relief.
- 1.1.5 The delivery of planned development has been proposed to ensure that the sites, and phasing of sites, that will be delivered in the first years of the Submission Local Plan, and therefore in the absence of the A3 Guildford scheme, as well as the Department for Transport's RIS Road Period 1 schemes for the M25 Junction 10/A3 Wisley interchange scheme and the M25 Junctions 10-16 scheme, are located where traffic associated with them will have the least impact on the Strategic Road Network's links and junctions where current congestion issues are the most acute.
- 1.1.6 This study responds to issues raised by Highways England with respect to the impact of proposed planned development in the Submission Local Plan on the Guildford section of the A3 trunk road in the period to 2024, the earliest date for the start of construction of the A3 Guildford scheme. Two specific issues are:

- the extent, in terms of length and duration, of mainline queuing resulting from blocking back of traffic exiting the A3 at diverge junctions in the peak periods;
- the operation of merging and diverging traffic associated with the junctions in the peak periods.

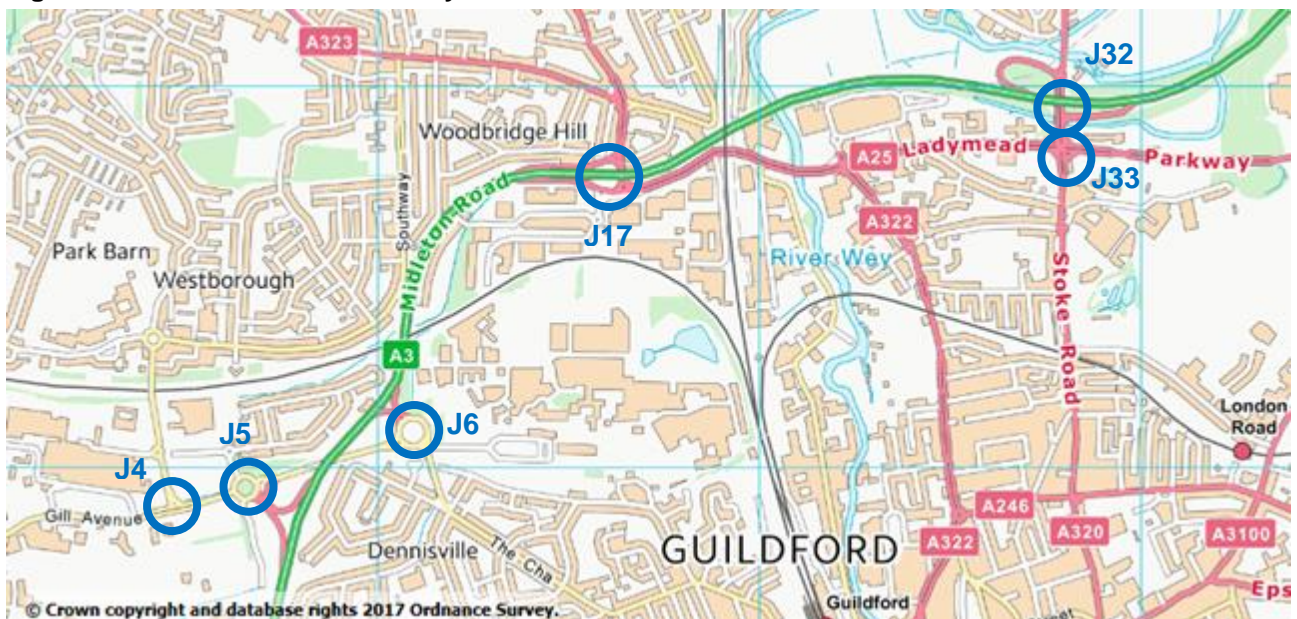
1.2 Junctions Considered

1.2.1 **Figure 1** shows the following junctions considered under this study (with numbering that is consistent with counts from Highways England):

- J4 – University signalised crossroads
- J5 – University (Tesco) roundabout
- J6 - Cathedral roundabout
- J17 – Dennis signalised roundabout
- J32 – A3 Off-slip / Woking Road signalised junction
- J33 – A25 / Stoke Road signalised crossroads.

1.2.2 The study considers how the operation of these junctions is predicted to change with the addition of traffic demand associated with the Submission Local Plan development and if this is likely to have any impact on the A3. The merge and diverge flows and layouts at each location are also considered.

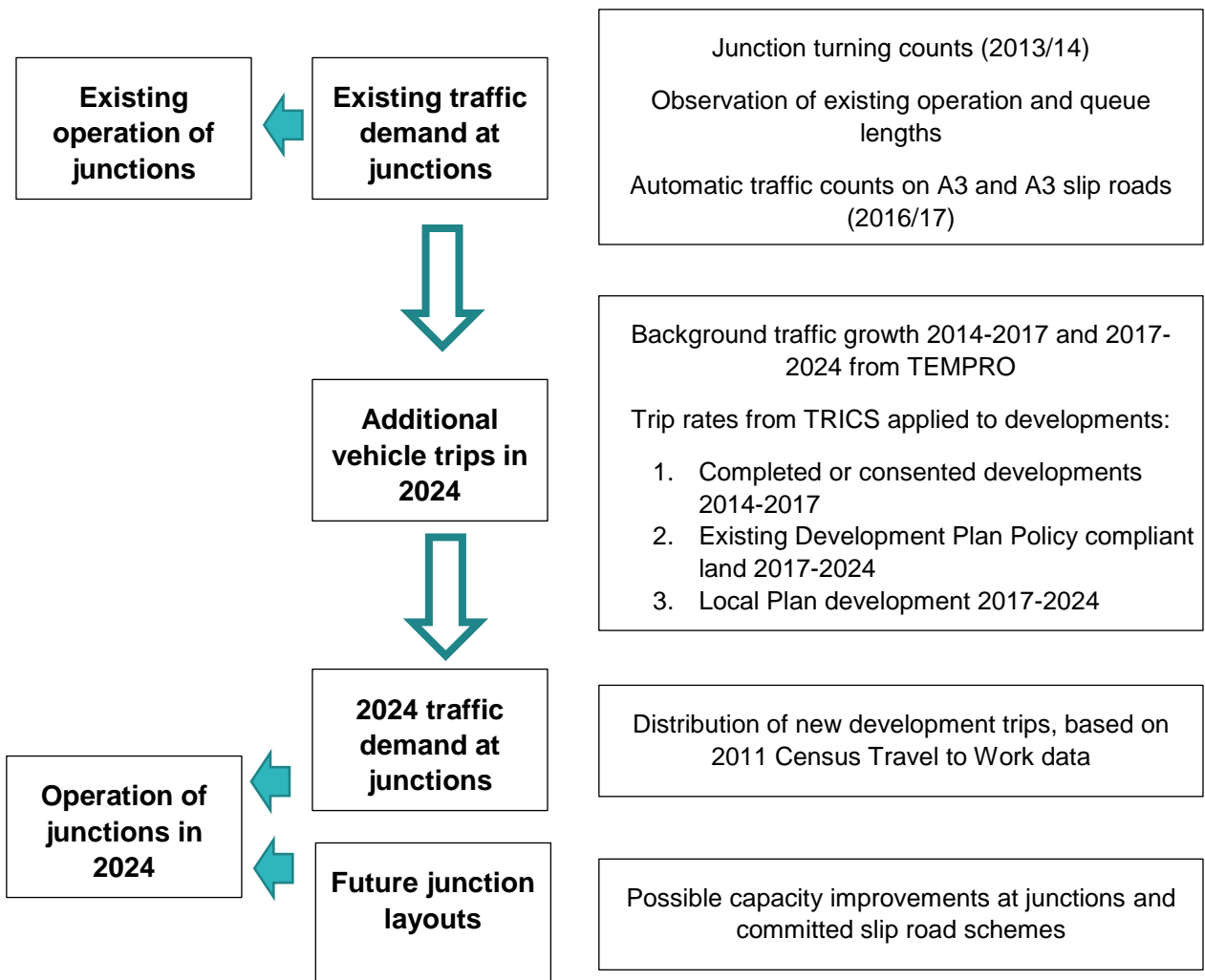
Figure 1: A3 Junctions within Study Area



2 Methodology

2.1.1 The overall methodology adopted for this study is summarised in **Figure 2** below. The aim of the study is to compare the predicted operation of the A3 junctions in 2024 with existing Development Plan Policy compliant land to the operation with the addition of trips associated with the Submission Local Plan development.

Figure 2: Outline of Study Methodology



3 Base Year Traffic Data

3.1 Junction Counts

3.1.1 Counts of turning movements, classified by vehicle class, were provided for all of the junctions that form part of this study. Peak hour movements were derived for the busiest hour over the AM and PM peak periods, based on total flow into each junction.

3.1.2 One survey in October 2013 collected data covering the University crossroads, University roundabout and Cathedral roundabout, giving a full matrix of movements through these junctions. Peak hour turning movements for each junction are given in **Tables 1-3**.

Table 1: University (Tesco) Roundabout – Count from Tuesday 8 October 2013

AM Peak – 08:00-09:00

From	To	A	B	C	D	E	Total
A - Tesco		0	114	50	12	93	269
B - Egerton Road East		124	0	364	21	1135	1644
C - A3 Slip Road		63	435	0	10	403	911
D - Holiday Inn		0	29	3	0	13	45
E - Egerton Road West		119	738	214	12	0	1083
Total		306	1316	631	55	1644	3952

PM Peak – 16:35-17:35

From	To	A	B	C	D	E	Total
A - Tesco		0	231	210	16	85	542
B - Egerton Road East		184	0	559	21	554	1318
C - A3 Slip Road		17	184	0	12	128	341
D - Holiday Inn		7	43	9	0	14	73
E - Egerton Road West		191	1029	509	15	0	1744
Total		399	1487	1287	64	781	4018

Source: SCC count

Table 2: Cathedral Roundabout – Count from Tuesday 8 October 2013

AM Peak – 08:00-09:00

From	To	A	B	C	D	Total
A - A3 Slip Road		0	347	296	798	1441
B - University		15	0	14	88	117
C - The Chase		36	123	0	758	917
D - Egerton Road		288	311	717	0	1316
Total		339	781	1027	1644	3791

PM Peak – 16:35-17:35

From	To	A	B	C	D	Total
A - A3 Slip Road		0	47	73	239	359
B - University		218	0	136	335	689
C - The Chase		77	11	0	744	832
D - Egerton Road		687	126	674	0	1487
Total		982	184	883	1318	3367

Source: SCC count

Table 3: University Crossroads – Count from Tuesday 8 October 2013

AM Peak – 08:00-09:00

From	To	A	B	C	D	Total
A - Egerton Road North		0	767	36	302	1105
B - Egerton Road East		444	0	148	1039	1631
C - Daphne Jackson		13	77	0	17	107
D - Gill Avenue		53	240	0	0	293
Total		510	1084	184	1358	3136

PM Peak – 16:35-17:35

From	To	A	B	C	D	Total
A - Egerton Road North		0	646	41	73	760
B - Egerton Road East		427	0	119	231	777
C - Daphne Jackson		28	183	0	2	213
D - Gill Avenue		198	900	0	0	1098
Total		653	1729	160	306	2848

Source: SCC count

3.1.3 **Table 4** shows the turning movements at the A3/A322/A25 Dennis junction.

Table 4: Dennis Roundabout – Count from Thursday 20 November 2014

AM Peak – 07:45-08:45

From	To	A	B	C	D	Total
A – A25 Midelton Road		0	232	696	469	1397
B – Surrey Way		39	0	33	17	89
C – A3 Slip Road		835	173	0	454	1462
D – A322 Worplesdon Road		1239	146	391	0	1776
Total		2113	551	1120	940	4724

PM Peak – 15:15-16:15

From	To	A	B	C	D	Total
A – A25 Midelton Road		0	50	769	829	1648
B – Surrey Way		120	0	93	69	282
C – A3 Slip Road		679	22	0	548	1249
D – A322 Worplesdon Road		771	32	338	0	1141
Total		1570	104	1200	1446	4320

Source: HE count

3.1.4 **Table 5** gives a turning matrix for the Stoke junction, taking the A3 off-slip and A25 crossroads junctions together.

Table 5: A3 Off Slip and A25 Crossroads – Count from Tuesday 18 November 2014

AM Peak – 07:30-08:30							
From	To	A	B	C	D	E	Total
A – Woking Road North		0	0	122	298	384	804
B - A3 Off-Slip Road		158	0	182	415	524	1279
C – A25 East		200	0	0	101	622	923
D – Stoke Road		420	0	83	0	122	625
E – A25 East		721	0	584	187	0	1492
Total		1499	0	971	1001	1652	5123
PM Peak – 15:00-16:00							
From	To	A	B	C	D	E	Total
A – Woking Road North		0	0	138	295	387	820
B - A3 Off-Slip Road		313	0	79	185	250	827
C – A25 East		278	0	0	75	493	846
D – Stoke Road		534	0	57	0	164	755
E – A25 East		972	0	598	186	0	1756
Total		2097	0	872	741	1294	5004

Source: HE count

3.2 Operation of Junctions

3.2.1 The operation of the A3 junctions was observed for both the AM and PM peak periods in the second week of October 2017. This ensured that the junctions were modelled correctly, in terms of use of particular lanes for turning movements, and also provided observations of queuing on each arm and interaction with adjacent junctions. The observations are summarised below and are believed to be representative of usual peak conditions.

University Junction

3.2.2 At this junction the A3 Southbound off-slip joins into the ‘Tesco’ roundabout (Egerton Road, Ashenden Road and access road for the Holiday Inn). Traffic heading for the University, Hospital and Surrey Research Park travels west along Egerton Road and east along Egerton Road for the town centre (via the Cathedral junction).

3.2.3 The main cause of congestion is the signalised crossroads to the west of the Tesco roundabout. The westbound straight-ahead movement has two lanes at the signals but this merges into one lane over length of around 30m. In the AM peak period, this merge causes traffic to slow down and constrains the capacity that the two lanes provide. As a result, long queues develop stretching back to the roundabout (**Figure 3**) and then through the roundabout, extending east on Egerton Road.

3.2.4 Before the exit from the roundabout was blocked, very little queuing was observed on the A3 off-slip. With queuing through the roundabout, the off-slip traffic struggles to find a gap, leading to queuing up the slip road. Observations showed the slip road queue was in two lanes to where the slip road narrows on one lane, from where the queue stretched back onto the A3 main carriageway between 07:50-09:00 (**Figure 4**).

Figure 3: Queue on Westbound Egerton Road Blocking Back Through Roundabout



Source: MM photo, 08:20 11 October 2017

Figure 4: Queue on A3 Northbound Off-slip reaching the A3 Main Carriageway



Source: MM photo, 07:55 11 October 2017

3.2.5 In the PM peak period, the main cause of congestion is the right turn at the signalised crossroads from westbound Egerton Road. Although a dedicated right-turn lane is provided all the way back to the roundabout, there is insufficient capacity at the signals which means that the queue stretches back to the roundabout (**Figure 5**).

Figure 5: Queue on Westbound Egerton Road Right-turn Lane



Source: MM photo, 16:03 12 October 2017

3.2.6 Despite this queue, in the PM peak period there are only very short queues on the A3 off-slip and on Egerton Road east of the roundabout (**Figure 6**).

Figure 6: Queue on A3 Northbound Off-slip in PM Peak Period



Source: MM photo, 17:04 12 October 2017

Cathedral Junction

3.2.7 The Cathedral junction is a roundabout where the A3 southbound off-slip meets Egerton Road (heading to the University) and The Chase (heading to the town centre). Part-time signals are provided on the A3 Off-slip arm but these were not in use in either the AM or PM peak period.

3.2.8 Generally, there is limited queuing at the roundabout, with minimal queuing on the A3 off-slip (**Figure 7**) in both peak periods. Occasionally, slow-moving traffic was observed on the A3 on-slip due to a vehicle that struggled to find a gap when merging onto the main carriageway. At times the queue on westbound Egerton Road (back from the Tesco roundabout) extended back to the Cathedral roundabout, giving longer queues on The Chase but other movements were not generally affected by this (**Figure 8**).

Figure 7: Queue on A3 Southbound Off-slip in AM Peak Period



Source: MM photo, 08:41 11 October 2017

Figure 8: Queue on Egerton Road back to Cathedral Roundabout



Source: MM photo, 08:27 11 October 2017

Dennis Junction

3.2.9 The Dennis junction is a signalised roundabout where the A3 southbound off-slip meets the A322 Worplesdon Road and A25 Midelton Road. The entry from the A322 to the north is the only arm that is not signalised, with a free-flow left-turn lane from the A322 to eastbound A25.

3.2.10 In the PM peak period this junction is very congested due to blocking back from the merge of the A3 Southbound on-slip onto the A3 main carriageway (**Figure 9**). This lack of capacity on the slip road leads to long queues on the westbound A25 and, to a lesser extent, southbound A322.

3.2.11 In the AM peak period the junction generally worked within capacity, with only short queues on all approaches. In both peak periods there was limited queuing on the A3 off-slip and it was mainly in the offside lane heading for the A25 (**Figure 10**).

Figure 9: Queue on A3 Southbound On-slip in PM Peak Period



Source: MM photo, 17:08 12 October 2017

Figure 10: Queue on A3 Northbound Off-slip in AM Peak Period



Source: MM photo, 08:41 11 October 2017

Stoke Junction

- 3.2.12 The Stoke junction is a signalised T-junction where the A3 southbound off-slip meets Woking Road. The A3 northbound on-slip is accessed via a roundabout to the north of the signals. Immediately south of the A3 off-slip signals Woking Road meets the A25 and Stoke Road at a signalised crossroads.
- 3.2.13 In both peak periods, queuing was observed on the A3 southbound off-slip (**Figure 11**) which was a result of the limited capacity available for the southbound Woking Road movement into the A25 junction. Queuing on Woking Road reaches the off-slip junction and reduces the slip road capacity as left-turning traffic is obstructed, even when it is given a green signal (**Figure 12**). The slip road queues are longer in the AM peak period compared to the PM peak period. At the A25 signals, long queues develop on the eastbound A25 in the PM peak and northbound Stoke Road (both peak periods)

Figure 11: Queue on A3 Southbound Off-slip in AM Peak Period



Source: MM photo, 08:12 11 October 2017

Figure 12: Queue on Woking Road Southbound in AM Peak Period



Source: MM photo, 08:05 11 October 2017

3.3 Automatic Traffic Counts (ATCs)

3.3.1 ATC data was extracted from the HE WebTris site for the following locations:

- A3 Northbound, south of A31 merge (Site 5526/1)
- A31 Northbound On-slip (Site 5526/2)
- A3 Southbound, south of A31 diverge (Site 5525/1)
- A31 Southbound Off-slip (Site 5525/2)
- University junction Northbound Off-slip (Site 5527/2)
- University junction Northbound On-slip (Site 5527/1)
- Cathedral junction Southbound Off-slip (Site 5528/1)
- A3 Southbound, between Cathedral On and Off-slips (Site 5528/2)
- Stoke junction Northbound On-slip (Site 5529/1)
- Stoke junction Southbound Off-slip (Site 5530/1)
- A3 Northbound, north of Stoke On-slip (Site 5531/1)
- A3 Southbound, south of Stoke Off-slip (Site 5530/2)

3.3.2 Using the above data, it is possible to derive counts for the missing sites of the Cathedral On-slip and Dennis On and Off-slip roads.

3.3.3 From the data, average hourly flows for each slip road and section of the main carriageway were calculated for an average weekday in June. For northbound, 2017 data was used but this was not available for all Southbound sites so 2016 data were used for Southbound. The results are shown in **Figures 13-14**.

3.4 Existing Trip Distributions

3.4.1 Existing travel to work patterns were extracted from the 2011 Census data, for which the most detailed level of disaggregation is 'Middle Super Output Areas' (MSOA). Guildford Borough is split into 18 MSOAs, with plans of the boundaries of these areas contained in **Appendix A**

(which also show the locations of the different developments discussed later). Two trip distributions were derived for each MSOA:

- Home-based – residents of the Borough travelling to work
- Employment-based – people travelling to work in the Borough.

3.4.2 A proportion of trips to/from each MSOA is contained within the Borough, with the distribution to other areas based on the following zoning system:

- At MSOA level to the neighbouring boroughs/districts of Waverley, Woking and Surrey Heath
- At borough/district level to all other areas in the South East (Census definition)
- At Census region level for rest of the UK (e.g. London, South West, East etc)

3.4.3 **Table 6** gives a summary of the distribution of trips to work for each of the MSOAs that the Borough is made up of, using data for car drivers only. The data shows that in all areas 10%-40% of residents work in the town of Guildford, with 22%-50% of trips contained within the whole Borough. Significant proportions of residents work in the nearby boroughs/districts of Waverley, Woking, Surrey Heath, Elmbridge, Mole Valley and Rushmoor, with the highest proportions for the MSOAs that are closest to each of these areas. Around 5%-18% work in London, with only 15%-25% working in the rest of the UK.

3.4.4 It should be noted that using travel to work data provides 'worst case' assumptions for likely development traffic flows using the A3 and associated junctions, as the residential trip rates used will include journeys for other purposes, including education, retail and leisure. Such trips are likely to be shorter in distance and contained within the urban area.

Figure 13: Merge/Diverge Flows – 2016/17 AM Peak Hour

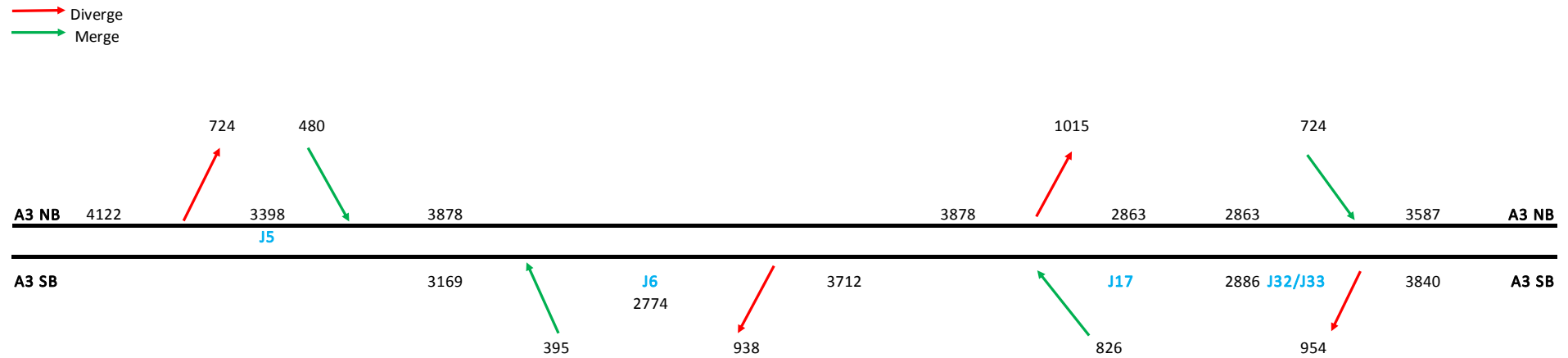
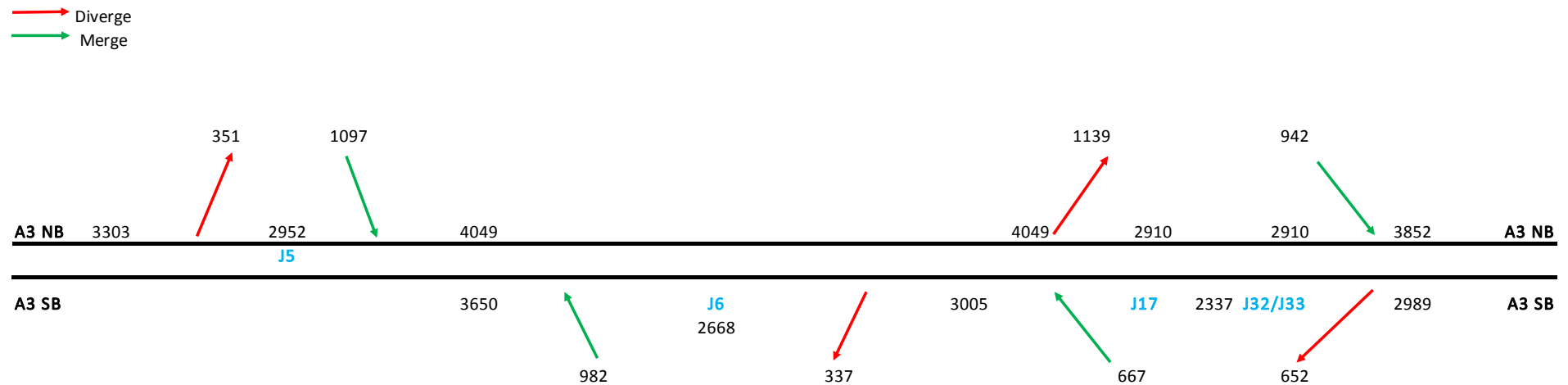


Figure 14: Merge/Diverge Flows – 2016/17 PM Peak Hour



Source: HE Traffic counts via <http://webtris.highwaysengland.co.uk/#>

Table 6: Travel to Work Distribution of Guildford Borough Residents (Car Drivers)

Usual Residence	Guildford Town	Other Guildford	Waverley	Woking	Surrey Heath	Elmbridge	Mole Valley	Rushmoor	London	Rest of UK
Guildford 001	17.0%	14.9%	4.5%	14.5%	2.2%	9.0%	3.6%	2.1%	15.5%	16.8%
Guildford 002	18.6%	22.2%	6.4%	11.5%	8.4%	2.3%	1.5%	6.4%	6.1%	16.5%
Guildford 003	10.4%	15.5%	3.7%	5.8%	0.5%	12.9%	14.0%	1.0%	17.8%	18.3%
Guildford 004	12.0%	10.4%	7.8%	5.3%	10.6%	1.3%	1.0%	19.9%	6.2%	25.3%
Guildford 005	34.6%	13.3%	8.5%	7.8%	3.2%	3.3%	2.9%	3.5%	7.8%	15.2%
Guildford 006	34.3%	9.9%	8.9%	7.7%	3.1%	4.6%	3.2%	3.0%	8.1%	17.2%
Guildford 007	38.2%	10.9%	7.9%	9.4%	2.7%	3.4%	2.8%	3.4%	7.1%	14.1%
Guildford 008	35.9%	10.1%	7.1%	7.1%	2.2%	4.1%	4.4%	2.7%	10.0%	16.4%
Guildford 009	34.7%	11.6%	9.3%	8.3%	2.7%	3.5%	2.8%	2.8%	8.3%	16.1%
Guildford 010	14.6%	11.7%	10.1%	5.0%	8.6%	1.9%	1.2%	20.3%	6.4%	20.3%
Guildford 011	33.8%	8.0%	7.5%	7.0%	2.5%	4.0%	4.8%	3.4%	9.4%	19.7%
Guildford 012	39.8%	11.6%	10.9%	6.7%	2.0%	2.0%	2.0%	3.4%	6.9%	14.7%
Guildford 013	26.0%	8.6%	10.3%	7.2%	3.2%	4.6%	3.7%	4.4%	10.1%	21.8%
Guildford 014	14.9%	12.4%	12.2%	4.7%	7.1%	1.9%	1.0%	18.6%	4.9%	22.1%
Guildford 015	29.1%	7.4%	10.7%	5.9%	3.0%	3.8%	2.2%	3.8%	9.7%	24.4%
Guildford 016	29.4%	7.3%	11.1%	6.7%	3.3%	3.1%	2.6%	2.8%	12.5%	21.2%
Guildford 017	24.5%	13.4%	19.3%	5.1%	2.9%	2.7%	2.4%	4.1%	8.7%	16.8%
Guildford 018	21.7%	16.8%	12.5%	5.0%	1.0%	5.4%	9.8%	0.6%	11.9%	15.3%

Source: analysis of 2011 Travel to Work Census Data

4 Future Traffic Volumes

4.1 Background Traffic Growth

- 4.1.1 The National Trip End Model (NTEM) forecasts the growth in trip origin-destinations (or productions-attractions) up to 2051 for use in transport modelling. The forecasts take into account national projections of:
- population
 - employment
 - housing
 - car ownership
- 4.1.2 The NTEM¹ software reads in projections for population, households, dwellings and employment at an aggregate spatial level. In the case of policy based dwelling inputs these are extracted from published local authority trajectories.
- 4.1.3 NTEM produces a 'central' forecast i.e. does not give a range between low and high traffic growth. Results from the NTEM forecasting suite are made available through the Department for Transport's TEMPRO software
- 4.1.4 With detailed local development information, the distribution of households or jobs can be adjusted at the zone level. This adjustment is achieved by using the 'Alternative planning assumptions' functionality within the TEMPRO software. Using the NTEM 7.2 planning data set, increases in the number of households and employees in Guildford Borough were set to zero in the future, allowing 'background' traffic growth to be calculated. This background growth takes into account additional trips due to new development in areas outside of the Borough itself, for example new trips into Guildford due to additional housing provided in the adjacent Borough of Waverley.
- 4.1.5 TEMPRO can give growth in person trips by travel mode for each Census area (MSOA) or for overall growth in a larger area by different type of road (which then also allows for growth due to future changes in relative fuel costs). The predicted growth for Guildford Borough (with no new development in the Borough) is detailed in **Table 7** for each peak period. The Urban Trunk Road figures have been used for this study, as applicable to the A3.

¹ NTEM Planning Data Version 7.2, Guidance Note, Department for Transport, February 2017

Table 7: Background Traffic Growth Factors from TEMPRO

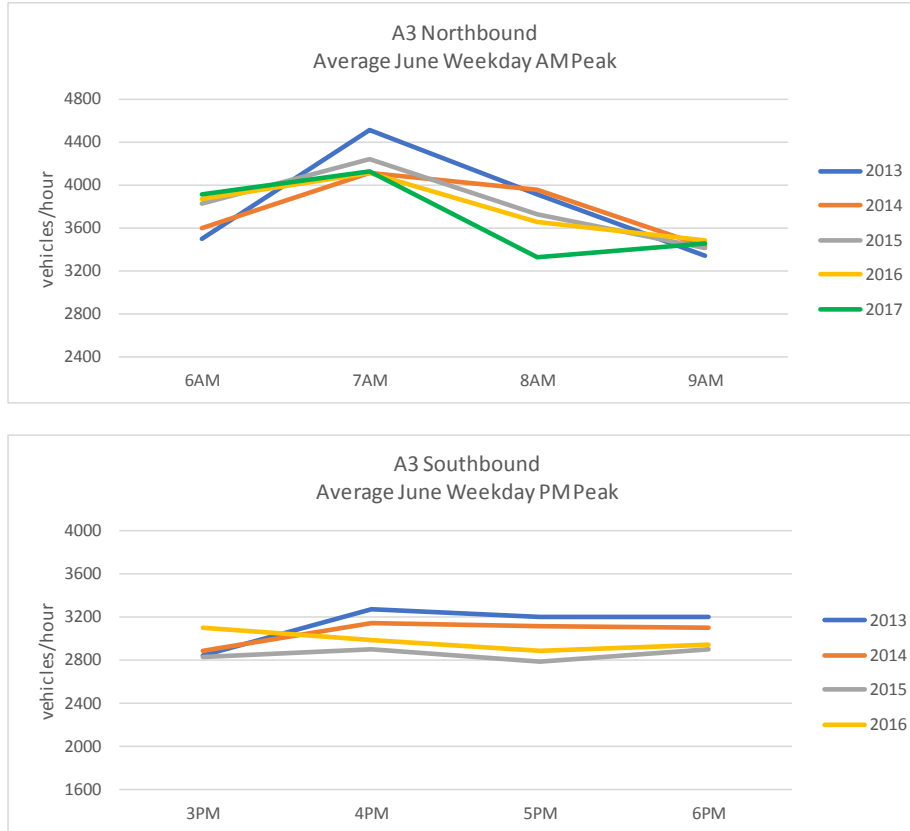
AM Peak Period	2013-2014	2014-2017	2017-2024
Urban Trunk	0.995	0.999	1.047
Urban Principal	0.995	0.998	1.040
Urban Minor	0.993	0.996	1.042
Rural Trunk	0.999	0.999	1.077
Rural Principal	0.996	0.999	1.056
Rural Minor	0.996	1.000	1.055

PM Peak Period	2013-2014	2014-2017	2017-2024
Urban Trunk	0.996	0.999	1.043
Urban Principal	0.995	0.998	1.036
Urban Minor	0.994	0.996	1.039
Rural Trunk	1.000	1.012	1.072
Rural Principal	0.996	0.999	1.052
Rural Minor	0.996	1.000	1.051

Source: TEMPROv7.2

4.1.6 No growth is shown between 2013-2014 and 2014-2017 and count data for the A3 over these years confirms that there has been no increase, as illustrated in **Figure 15** (no data are available for Southbound in 2017). In fact, the peak flows are shown to have reduced since 2013.

Figure 15: Peak Period Traffic Flows on the A3



Source: HE Traffic counts via <http://webtris.highwaysengland.co.uk/#>

4.2 Development Trips

4.2.1 Three sets of data on new developments were supplied by GBC:

- developments that have been completed or granted planning consent between 2014 and October 2017 (referred to as 'Completions 2014-2017' in the following tables);
- existing Development Plan Policy compliant land – sites that would be expected to come forward and be completed by 2024. The existing Development Plan includes saved policies from the 2003 Local Plan and NPPF compliant sites;
- developments proposed within, and which would only come forward with, the Submission Local Plan for completion between 2017-2024.

4.2.2 An OS grid reference was provided for each development, which allowed the development to be allocated to one of the Guildford MSOAs. **Tables 8-10** detail the development for each set by MSOA and by land use type.

4.2.3 For some MSOAs negative employment areas are shown for the completions and existing policy compliant sites. This is because some existing employment locations have been, or will be, redeveloped for residential uses.

Table 8: Completions 2014-2017

	Homes (no.)	Student Accom (no. beds)	Care home (no. beds)	Industria l (sqm)	Office (sqm)	Retail comp'n (sqm)	Retail conv'nce (sqm)	A2-A5 (sqm)
Guildford 001	82	0	0	0	-766	0	0	0
Guildford 002	26	0	0	2000	0	0	0	0
Guildford 003	28	0	0	0	-180	0	0	0
Guildford 004	9	0	0	0	0	0	0	0
Guildford 005	10	0	0	0	0	0	0	0
Guildford 006	1	0	0	0	0	0	0	0
Guildford 007	31	0	0	0	0	0	0	0
Guildford 008	18	0	0	0	0	0	0	0
Guildford 009	10	0	0	0	0	0	0	0
Guildford 010	6	0	0	0	0	0	0	0
Guildford 011	21	0	0	0	0	0	0	0
Guildford 012	9	0	0	0	0	0	0	0
Guildford 013	119	0	-3	0	630	630	0	0
Guildford 014	102	0	0	0	0	0	0	0
Guildford 015	244	0	0	0	0	0	0	0
Guildford 015A	23	0	0	0	-134	0	0	0
Guildford 016	51	0	0	0	0	0	0	0
Guildford 017	5	0	0	0	0	0	0	0
Guildford 017A	4	0	0	0	0	0	0	0
Guildford 018	37	0	0	0	-88	0	0	0
Total	836	0	-3	2000	-538	630	0	0

Source: GBC data

Table 9: Existing Policy Compliant Sites 2017-2024

	Homes (no.)	Student Accom (no. beds)	Care home (no. beds)	Industrial (sqm)	Office (sqm)	Retail comp'n (sqm)	Retail conv'nce (sqm)	A2-A5 (sqm)
Guildford 001	79	0	0	-2090	4091	0	0	0
Guildford 002	25	0	0	-3604	0	0	0	0
Guildford 003	47	0	0	-315	-140	0	0	0
Guildford 004	17	0	0	0	0	0	0	0
Guildford 005	57	0	0	0	0	0	0	0
Guildford 006	14	0	0	0	0	0	0	0
Guildford 007	3	0	0	0	0	0	0	0
Guildford 008	11	0	0	0	0	0	0	0
Guildford 009	48	0	0	0	0	0	0	0
Guildford 010	7	0	0	0	0	0	0	0
Guildford 011	23	0	0	0	0	0	0	0
Guildford 012	35	0	0	0	0	0	0	0
Guildford 013	160	200	0	0	-1731	0	0	0
Guildford 014	1161	0	0	-310	0	0	0	0
Guildford 015	195	0	0	-4870	1000	0	0	0
Guildford 015A	193	0	0	0	0	0	0	0
Guildford 016	133	0	0	0	-523	0	0	0
Guildford 017	42	0	0	-395	0	0	0	0
Guildford 017A	41	112	0	0	0	0	0	0
Guildford 018	36	0	0	0	0	0	0	0
Total	2327	312	0	-11584	2697	0	0	0

Source: GBC data

Table 10: Dependent on Submission Local Plan 2017-2024

	Homes (no.)	Student Accom (no. beds)	Care home (no. beds)	Industrial (sqm)	Office (sqm)	Retail comp'n (sqm)	Retail conv'nce (sqm)	A2-A5 (sqm)
Guildford 001	848	0	0	8943	2550	538	645	791
Guildford 002	0	0	0	0	0	0	0	0
Guildford 003	458	0	0	-525	0	0	0	0
Guildford 004	0	0	0	0	0	0	0	0
Guildford 005	150	0	60	0	0	0	0	0
Guildford 006	0	0	0	0	0	0	0	0
Guildford 007	0	0	0	0	0	0	0	0
Guildford 008	0	0	0	0	0	0	0	0
Guildford 009	0	0	0	0	0	0	0	0
Guildford 010	0	0	0	0	0	0	0	0
Guildford 011	0	0	0	0	0	0	0	0
Guildford 012	150	0	0	0	2499	42	60	46
Guildford 013	0	0	0	0	0	0	0	0
Guildford 014	0	0	0	0	0	0	0	0
Guildford 015	0	0	0	0	0	0	0	0
Guildford 015A	0	0	0	0	0	0	0	0
Guildford 016	0	0	0	0	0	0	0	0
Guildford 017	20	0	0	0	0	0	0	0
Guildford 017A	0	0	0	0	0	0	0	0
Guildford 018	0	0	0	0	0	0	0	0
Total	1626	0	60	8418	5049	580	705	837
Guildford Borough Totals								
2014-2017	836	0	-3	2000	-538	630	0	0
Existing policy compliant sites	2327	312	0	-11584	2697	0	0	0
Dependent on Submission Local Plan	1626	0	60	8418	5049	580	705	837
Total	4789	312	57	-1166	7208	1210	705	837

Source: GBC data

4.3 Trip Rates

- 4.3.1 Trip rates for new developments were based on TRICS rates (v7.2.4) provided by SCC. The rates used were appropriate to the location i.e. Town Centre, Sub Urban, Edge of Town Centre and Neighbourhood Centre, as detailed in **Table 11**.
- 4.3.2 Due to a limited number of surveys for some areas, not every category of land use has a rate for all locations, so the next most appropriate location was used for other areas. The trip rates apply to number of units for residential (houses and flats), number of beds/rooms for student accommodation and care homes and per 100sqm gross floor area for employment, retail and food/drink uses.

4.3.3 A pcu factor is also shown for each trip rate which was used to convert vehicle numbers into passenger car units (pcus) which are used in the junction capacity analysis. The use of pcus is so that the greater impact of larger vehicles is taken into account e.g. a rigid heavy goods vehicle is equivalent to 1.5 cars. The pcu factor is calculated in TRICS from the mix of vehicle classes recorded from the surveys used in the database. Most land uses have a low pcu factor (just over 1.00) reflecting low volumes of heavy goods vehicles and buses, although for the Industrial Estate the factor is higher, as expected, at 1.04-1.05

Table 11: Vehicle Trip Rates

Location	Land Use	Category	No. of surveys	Arr	Arr	Dep	Dep	pcu factor
				08:00	17:00	08:00	17:00	
Town Centre	3 Residential	C Flats privately owned	5	0.030	0.068	0.056	0.056	1.007
Suburban Area	3 Residential	M Mixed private/affordable housing	16	0.116	0.251	0.289	0.144	1.006
Neighbourhood Centre	3 Residential	M Mixed private/affordable housing	4	0.117	0.329	0.360	0.174	1.002
Town Centre	2 Employment	A Office	12	0.286	0.032	0.039	0.274	0.996
Suburban Area	2 Employment	A Office	10	0.690	0.151	0.200	0.592	1.003
Suburban Area	2 Employment	D Industrial Estate	12	0.191	0.064	0.112	0.158	1.052
Neighbourhood Centre	2 Employment	D Industrial Estate	3	0.262	0.046	0.178	0.176	1.043
Edge of Town Centre	5 Health	F Care home (elderly residential)	4	0.046	0.046	0.040	0.114	1.011
Edge of Town Centre	3 Residential	G Student accommodation	2	0.005	0.000	0.000	0.011	1.000
Town Centre	1 Retail	I Shopping centre- local shops	1	15.313	11.719	14.531	11.875	1.000
Suburban Area	1 Retail	I Shopping centre- local shops	5	3.456	4.106	2.885	3.950	1.021
Town Centre	1 Retail	O Convenience stores	5	2.870	3.248	2.176	4.068	1.001
Suburban Area	1 Retail	O Convenience stores	8	9.932	12.110	10.298	10.619	1.004
Town Centre	6 Hotel, food and drink	B Restaurants	5	0.000	0.967	0.000	0.636	1.001
Edge of Town Centre	6 Hotel, food and drink	B Restaurants	5	0.000	2.191	0.000	1.878	1.001

Source: Rates from TRICS V7.2.4 provided by SCC

4.4 Generated Trips

Applying the trip rates to the development in each MSOA gives the total number of vehicles arriving and departing in the AM (08:00-09:00) and PM (17:00-18:00) peak hours. **Tables 12-14** show the resultant trips from residential (home based) and other uses (employment based) for the three different development datasets.

- 4.4.1 For some MSOAs negative employment trips are shown. This is because some existing employment locations have been, or will be, redeveloped for residential uses, as noted earlier. **Table 15** gives a summary of the total number of vehicles generated for each of the development datasets.

Table 12: Vehicle Trips for Completions 2014-2017

		Total HOME based				Total EMPLOYMENT based			
		Arr	Arr	Dep	Dep	Arr	Arr	Dep	Dep
		08:00	17:00	08:00	17:00	08:00	17:00	08:00	17:00
2014-2017									
Guildford 001	Neighbourhood Centre	10	27	30	14	-5	-1	-2	-5
Guildford 002	Neighbourhood Centre	3	9	9	5	5	1	4	4
Guildford 003	Neighbourhood Centre	3	9	10	5	-1	0	0	-1
Guildford 004	Neighbourhood Centre	1	3	3	2	0	0	0	0
Guildford 005	Neighbourhood Centre	1	3	4	2	0	0	0	0
Guildford 006	Suburban Area	0	0	0	0	0	0	0	0
Guildford 007	Suburban Area	4	8	9	4	0	0	0	0
Guildford 008	Suburban Area	2	5	5	3	0	0	0	0
Guildford 009	Suburban Area	1	3	3	1	0	0	0	0
Guildford 010	Neighbourhood Centre	1	0	1	1	0	0	0	0
Guildford 011	Suburban Area	2	5	6	3	0	0	0	0
Guildford 012	Suburban Area	1	2	3	1	0	0	0	0
Guildford 013	Town Centre	3	8	7	6	98	74	92	77
Guildford 014	Neighbourhood Centre	12	34	37	18	0	0	0	0
Guildford 015	Town Centre	7	17	14	14	0	0	0	0
Guildford 015A	Town Centre	1	2	1	1	0	0	0	0
Guildford 016	Suburban Area	6	13	15	7	0	0	0	0
Guildford 017	Neighbourhood Centre	1	2	2	1	0	0	0	0
Guildford 017A	Neighbourhood Centre	0	1	1	1	0	0	0	0
Guildford 018	Neighbourhood Centre	4	12	13	6	-1	0	0	-1
	Total	65	162	173	96	96	73	93	74

Source: TRICS trip rates applied to development quantum from GBC

Table 13: Vehicle Trips – Existing policy compliant sites 2017-2024

		Total HOME based				Total EMPLOYMENT based			
		Arr	Arr	Dep	Dep	Arr	Arr	Dep	Dep
		08:00	17:00	08:00	17:00	08:00	17:00	08:00	17:00
Existing policy compliant sites									
Guildford 001	Neighbourhood Centre	9	26	28	14	23	5	4	20
Guildford 002	Neighbourhood Centre	3	8	9	4	-10	-2	-7	-7
Guildford 003	Neighbourhood Centre	6	15	17	8	-2	0	-1	-1
Guildford 004	Neighbourhood Centre	2	6	6	3	0	0	0	0
Guildford 005	Neighbourhood Centre	7	19	21	10	0	0	0	0
Guildford 006	Suburban Area	2	4	4	2	0	0	0	0
Guildford 007	Suburban Area	0	1	1	0	0	0	0	0
Guildford 008	Suburban Area	1	3	3	2	0	0	0	0
Guildford 009	Suburban Area	6	12	14	7	0	0	0	0
Guildford 010	Neighbourhood Centre	1	0	1	1	0	0	0	0
Guildford 011	Suburban Area	3	6	7	3	0	0	0	0
Guildford 012	Suburban Area	4	9	10	5	0	0	0	0
Guildford 013	Town Centre	6	11	9	11	-5	-1	-1	-5
Guildford 014	Neighbourhood Centre	136	383	419	202	-1	0	-1	-1
Guildford 015	Town Centre	6	13	11	11	-7	-3	-5	-5
Guildford 015A	Town Centre	6	13	11	11	0	0	0	0
Guildford 016	Suburban Area	16	34	39	19	-4	-1	-1	-3
Guildford 017	Neighbourhood Centre	5	14	15	7	-1	0	-1	-1
Guildford 017A	Neighbourhood Centre	5	14	15	8	0	0	0	0
Guildford 018	Neighbourhood Centre	4	12	13	6	0	0	0	0
Total		227	601	652	336	-6	-2	-12	-2

Source: TRICS trip rates applied to development quantum from GBC

Table 14: Vehicle Trips – Dependent on Submission Local Plan Development 2017-2024

		Total HOME based				Total EMPLOYMENT based			
		Arr	Arr	Dep	Dep	Arr	Arr	Dep	Dep
		08:00	17:00	08:00	17:00	08:00	17:00	08:00	17:00
2014-2017									
Guildford 001	Neighbourhood Centre	99	279	306	148	125	126	104	137
Guildford 002	Neighbourhood Centre	0	0	0	0	0	0	0	0
Guildford 003	Neighbourhood Centre	54	151	165	80	-1	0	-1	-1
Guildford 004	Neighbourhood Centre	0	0	0	0	0	0	0	0
Guildford 005	Neighbourhood Centre	20	52	57	33	0	0	0	0
Guildford 006	Suburban Area	0	0	0	0	0	0	0	0
Guildford 007	Suburban Area	0	0	0	0	0	0	0	0
Guildford 008	Suburban Area	0	0	0	0	0	0	0	0
Guildford 009	Suburban Area	0	0	0	0	0	0	0	0
Guildford 010	Neighbourhood Centre	0	0	0	0	0	0	0	0
Guildford 011	Suburban Area	0	0	0	0	0	0	0	0
Guildford 012	Suburban Area	17	38	44	22	25	14	12	24
Guildford 013	Town Centre	0	0	0	0	0	0	0	0
Guildford 014	Neighbourhood Centre	0	0	0	0	0	0	0	0
Guildford 015	Town Centre	0	0	0	0	0	0	0	0
Guildford 015A	Town Centre	0	0	0	0	0	0	0	0
Guildford 016	Suburban Area	0	0	0	0	0	0	0	0
Guildford 017	Neighbourhood Centre	2	7	7	3	0	0	0	0
Guildford 017A	Neighbourhood Centre	0	0	0	0	0	0	0	0
Guildford 018	Neighbourhood Centre	0	0	0	0	0	0	0	0
Total		193	527	578	286	149	140	116	160

Source: TRICS trip rates applied to development quantum from GBC

Table 15: Summary of Vehicle Trips

	Total HOME based (vehs/hour)				Total EMPLOYMENT based (vehs/hour)			
	Arr	Arr	Dep	Dep	Arr	Arr	Dep	Dep
	08:00	17:00	08:00	17:00	08:00	17:00	08:00	17:00
2014-2017	65	162	173	96	96	73	93	74
Existing policy compliant sites	227	601	652	336	-6	-2	-12	-2
Dependent on Submission Local Plan	193	527	578	286	149	140	116	160
Total	485	1291	1403	718	238	212	198	231

4.5 Trip Distribution

4.5.1 The vehicle trips to/from each MSOA were then distributed between the Guildford MSOAs and external areas, based on the existing distributions detailed in **Table 6**. This gave a full matrix of trips between the different 'zones'.

- 4.5.2 For each movement between MSOAs in Guildford and to/from all external zones, a route was derived through the Borough road network. This identified movements that would use or pass through the junctions being considered on the A3. **Figure 16** shows the junction coding numbers (consistent with the traffic count reference numbers as listed below) and arm references:
- J4 – University signalised crossroads
 - J5 – University (Tesco) roundabout
 - J6 - Cathedral roundabout
 - J17 – Dennis signalised roundabout
 - J32 – A3 Off-slip signalised junction
 - J33 – A25 / Stoke Road signalised crossroads.
- 4.5.3 A 'matrix' of movements to/from each MSOA was produced highlighting which junctions and turning movements would experience additional demand. **Table 16** is an extract from the matrix showing assumed routes from each Guildford MSOA and some of the Waverley MSOAs (the full matrix is in **Appendix B**, showing routes between all internal and external zones).
- 4.5.4 Taking movements from Guildford MSOA 14 to 7, for example, shows the assumed route via junction 17 (A3 Dennis junction) moving from Arm D to Arm B, followed by Arm F to Arm C at junction 33 (Stoke crossroads) then Arm C to Arm A at the A3 off-slip road signals.
- 4.5.5 MSOA 15 and 17 were split into two (15A and 17A) as the constraint of the railway line meant that there would be different routes to/from sites to the east and west of the railway.

Figure 16: Junction Numbering

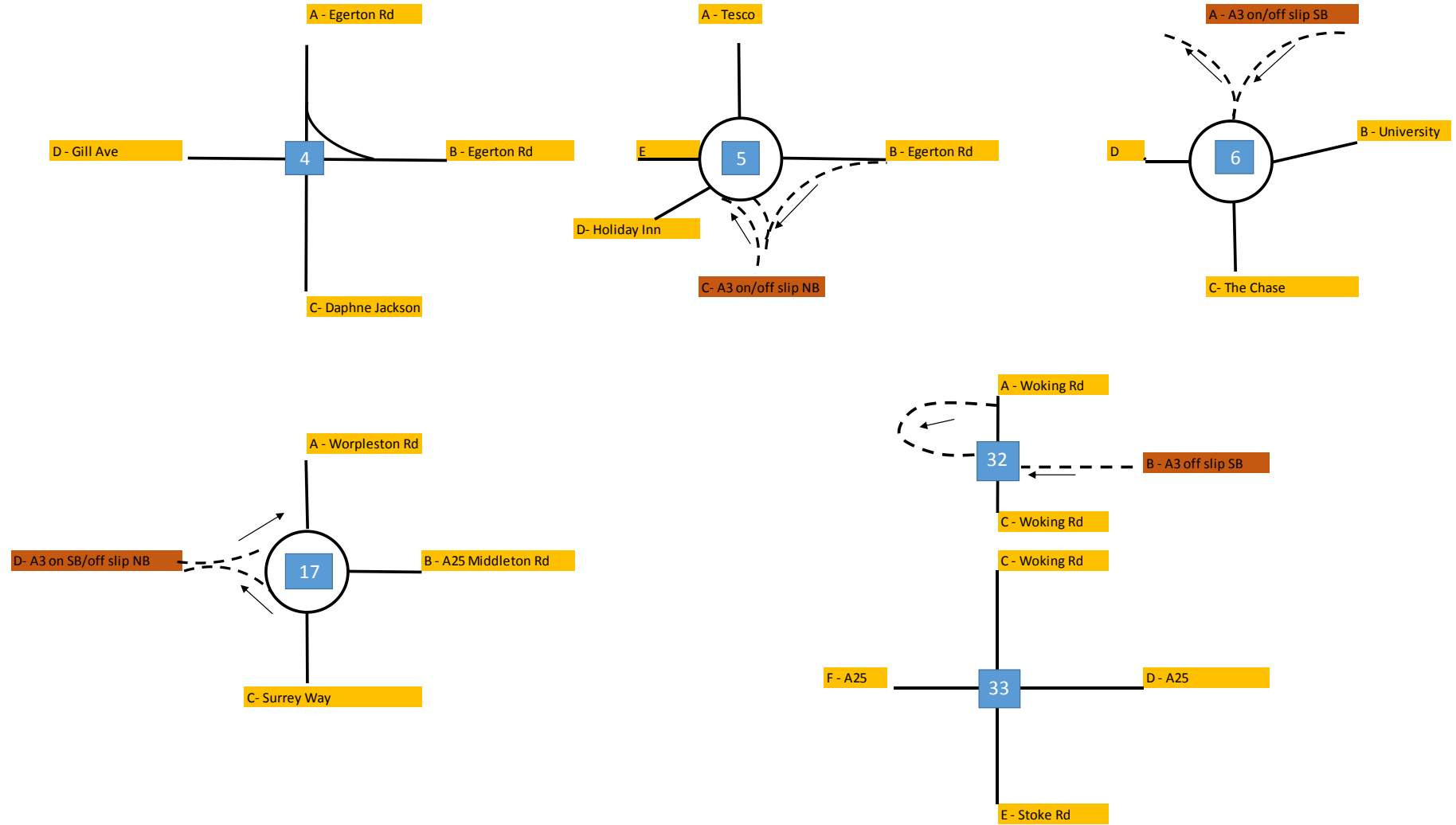


Table 16: Extract of Routes Matrix

from: Usual Residence	Guildford 001	Guildford 002	Guildford 003	Guildford 004	Guildford 005	Guildford 006	Guildford 007	Guildford 008	Guildford 009	Guildford 010	Guildford 011
Guildford 001						32BA	32BA		32BA		
Guildford 002											
Guildford 003					17BA, 33DF	32BA			32BC, 33CF, 17BA		
Guildford 004											
Guildford 005			17AB, 33FD								
Guildford 006	32AB		32AB							17AD	32AC, 33CD
Guildford 007	32AB		17AB							17AD	32AC, 33CD
Guildford 008									33DF, 17BA		
Guildford 009	32AB							17AB, 33FD		17AD	17AB, 33FD
Guildford 010						17DA	17DA		17DA		17DB, 33FD
Guildford 011						33DC, 32CA	33DC, 32CA		33DF, 17BA	17BD, 33DF	
Guildford 012	4AB, 5EC		4AB, 5EC					17AB, 33FD		4AB, 5EB, 6DA	17AB, 33FD
Guildford 013	33EC, 32CA	17BA			17BA	17CA	33EC, 32CA		17BA		
Guildford 014					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA		
Guildford 015	33EC, 32CA	17BA			17BA	17BA			17BA		
Guildford 015A	6CD, 5BC	6CD, 5BC, 17DA	17BA		6CD, 5BC, 17DA	6CD, 5BC, 17DA	6CD, 5BC, 17DB, 33FC, 32CA		6CD, 5BC, 17DA		
Guildford 016	33EC, 32CA				17BA	17BA	33EC, 32CA		17BA		
Guildford 017	33EC, 32CA				17BA	17BA	33EC, 32CA		17BA		
Guildford 017A					17DA	17BA	33EC, 32CA		17DA		
Guildford 018						33DC, 32CA			17BA		
Waverley 001					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA		17DB, 33FD
Waverley 002					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA		17DB, 33FD
Waverley 003					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA		17DB, 33FD
Waverley 004					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA		17DB, 33FD
Waverley 005	6CD, 5BC				17DA	17DA	33EC, 32CA		17DA		

Table 17: Vehicle Trips Using the A3 Slip Roads

A3 Slip Road	AM Peak Hour 08:00-09:00 (pcus/hour)					PM Peak Hour 17:00-18:00 (pcus/hour)				
	Completions 2014-2017	Existing policy compliant sites	Dependent on Submission Local Plan	Completions 2014-2017 + Existing policy compliant sites	Completions 2014-2017 + Existing policy compliant sites + Local Plan	Completions 2014-2017	Existing policy compliant sites	Dependent on Submission Local Plan	Completions 2014-2017 + Existing policy compliant sites	Completions 2014-2017 + Existing policy compliant sites + Local Plan
University Merge	1	6	19	8	31	3	7	31	10	41
University Diverge	4	16	13	20	39	4	11	16	14	43
Cathedral Merge	4	8	17	12	44	4	15	14	19	42
Cathedral Diverge	3	6	32	9	41	2	8	24	9	36
Dennis Merge	9	22	20	31	31	6	21	12	27	27
Dennis Diverge	5	25	7	30	30	9	25	19	34	34
Stoke Merge	24	17	26	41	67	21	11	45	32	77
Stoke Diverge	23	8	46	31	76	21	18	32	39	71
Using A3	73	108	180	181	358	69	115	192	184	371
Total trips	427	861	1035	1287	2312	405	934	1112	1339	2435
% Using A3	17%	13%	17%	14%	16%	17%	12%	17%	14%	15%

Source: MM analysis

- 4.5.6 The total number of vehicles (and pcus) making each particular junction turning movement was then determined by summing up all trips within the matrix that were allocated that turning movement.
- 4.5.7 **Table 17** shows how much of the total trip generation would use the A3 junctions, based on the assumed route allocations, with a table of all junction turning movements provided in **Appendix C**. This shows that around 180-190 pcus/hour associated with the Submission Local Plan would be expected to use all of the A3 slip roads in the AM and PM peak hours. This equates to approximately 17% of all Submission Local Plan trips, noting that some of these trips would use more than one A3 slip road e.g, to join and then leave the A3, so the proportion of trips would be less than 17%.
- 4.5.8 The increases in flow on the slip roads due to the Submission Local Plan development are shown to be relatively low in all cases.

5 Junction Capacity Analysis

5.1 Stoke Junction

- 5.1.1 The performance of the signal junction of the A3 southbound off-slip with Woking Road was assessed with a LINSIG model. The model also includes the A25 / Stoke Road signalised crossroads, as the junctions are very close together and queuing from the crossroads affects the A3 off-slip junction, as detailed in Section 3.2.
- 5.1.2 The following peak hours were modelled, determined from the total flow entering the junction from all arms:
 - AM peak hour 07:30-08:30
 - PM peak hour 15:00-16:00
- 5.1.3 The flow from the southbound A3 off-slip onto the southbound Woking Road remains fairly constant over the whole afternoon/evening period at around 500 vehicles/hour, with the flow at 17:00-18:00 similar to that for 15:00-16:00.
- 5.1.4 LINSIG does not model the impact of queuing from one junction reducing the capacity of an adjacent junction, therefore, the model had to be adjusted to reflect reduced capacity on the off-slip. This was done by reducing the green time available for the off-slip by 25 seconds in each cycle for both AM and PM peak hours, to reflect the time that off-slip traffic was not moving due to queuing on Woking Road. This was through the LINSIG feature that allows additional green time to be included on links but in this case negative additional time was added.
- 5.1.5 The results of the capacity testing are detailed in **Table 18** by way of the degree of saturation and queue length (mean maximum queue) for the A3 off-slip, taking the highest value from the three lanes. The results are shown for a 2014 base case and then 2024 with background growth and trips from existing policy compliant sites, with and without the Submission local Plan trips.
- 5.1.6 It was assumed that the green time allocated to the A3 off-slip would remain the same in the future as that modelled for 2014.

Table 18: Performance of A3 Off-slip at Stoke Junction

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	89.0%	68.3%	94.1%	71.8%	99.2%	78.1%
Queue length (pcus)	17.9	10.4	20.9	11.1	23.1	12.1

Source: LINSIG results

- 5.1.7 The results show that the additional demand due to the Submission Local Plan trips increases the degree of saturation, as would be expected, but this only causes the queue length to increase by 2.2 pcus in the AM peak hour and 1.0 pcus in the PM peak hour.

- 5.1.8 The tests also assume that existing policy compliant sites and Submission Local Plan development flows will be as those generated for the 'usual' peak hours of 08:00-09:00 and 17:00-18:00. Therefore, the tests are considered robust, in terms of predicted traffic movements in 2024.
- 5.1.9 There is a committed improvement scheme for the A25 Stoke crossroads and A3 off-slip junction which will allow improved co-ordination between the two junctions and should improve overall efficiency. Highways England also have a committed scheme to widen the A3 off-slip: this would widen the existing narrow lanes but would not lengthen the existing three-lane section. In LINSIG wider lanes would increase the link capacity but this has not been modelled due to the constraint of blocking back on Woking Road which means that the additional capacity would not be realised.
- 5.1.10 Therefore, it is concluded that the addition of the Submission Local Plan trips would not have a detrimental impact on the operation of the A3 at the Stoke junction.

5.2 Dennis Junction

- 5.2.1 The performance of the signalised roundabout where the A3 northbound off-slip meets the A322 Worplesdon Road and A25 Midleton Road was modelled with LINSIG.
- 5.2.2 The following peak hours were modelled, determined from the total flow entering the junction from all arms:
 - AM peak hour 07:45-08:45
 - PM peak hour 15:15-16:15
- 5.2.3 Again negative additional green time was used to reflect the reduced capacity for the movement onto the A3 on-slip (green time reduced by 25 seconds from the A25). **Table 19** shows the results for the A3 Off-slip and in each case this is for the offside lane as this has the highest flow.

Table 19: Performance of A3 Off-slip at Dennis Junction

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	86.6%	80.3%	91.8%	85.2%	91.8%	85.2%
Queue length (pcus)	14.6	11.9	18.1	13.7	18.1	13.7

Source: LINSIG results

- 5.2.4 The results show that the additional demand due to the Submission Local Plan trips does not change the results in both AM and PM peak hours. This is because the Submission Local Plan trips all turn left onto the A322, rather than straight on for the A25, and the nearside lane that is dedicated to the A322 movement has spare capacity. The queue length of 18.1 pcus is equivalent to 109m (at 6m per pcu) which is contained within the two-lane section of the slip road (which is approximately 140m, with a further 100m before the queue would extend onto the A3 main carriageway).
- 5.2.5 Therefore, it is concluded that the addition of the Submission Local Plan trips would not have a detrimental impact on the operation of the A3 at the Dennis junction.

5.3 University and Cathedral Junction

- 5.3.1 The performance of the roundabouts at these two junctions was assessed using a linked ARCADY model (Junctions9 software). A LINSIG model was also used to assess the Egerton Road signalised crossroads and to assess a proposed scheme to signalise the Tesco roundabout.
- 5.3.2 The following peak hours were modelled, determined from the total flow entering the junction from all arms:
- AM peak hour 08:00-09:00
 - PM peak hour 16:35-17:35
- 5.3.3 The constraint of the merge of the two straight-ahead lanes on the westbound Egerton Road at the signalised crossroads was modelled by including 19 seconds of negative green time. **Table 20** shows the performance of Egerton Road westbound which is the key link that dictates the overall capacity at the junction.

Table 20: Performance of Westbound Egerton Road at Signalised Crossroads

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	99.0%	95.4%	102.8%	101.0%	102.9%	104.7%
Queue length (pcus)	26.6	17.5	34.4	24.7	34.7	32.5

Source: LINSIG results

- 5.3.4 The queue of 27 pcus in the 2014 Base Case AM peak stretches back through the roundabout, as there is only stacking space for around 23 pcus (140m), reflecting the observed congestion. The LINSIG model cannot replicate the impact of this blocking back on the A3 off-slip and Egerton Road arms of the Tesco roundabout. However, the analysis shows that in the AM peak when the A3 is most affected, the 2024 results give a minimal increase in queue from 34.4 pcus to 34.7 pcus with the Submission Local Plan trips.
- 5.3.5 The Submission Local Plan includes improvements in this area, with the LRN2 scheme to improve the roundabout, as detailed in the Infrastructure Schedule. Improvements are also planned as part of the Guildford Sustainable Movement Corridor 1 - West (SMC1). The SMC1 scheme is aligned with the principles in the Guildford Town and Approaches Movement Study and the 2017 Guildford Borough Transport Strategy (2017) and is endorsed within the Enterprise M3 LEP Strategic Economic Plan.
- 5.3.6 This package of improvements is for the corridor between the Hospital/University sites and the town centre (rail station) along Gill Avenue, Egerton Road, The Chase and Guildford Park Drive. The proposed works involve junction improvements to reduce congestion but also include new and improved pedestrian and cycle provision and bus priority along this corridor. The outline scheme drawings are provided in **Appendix D**.
- 5.3.7 Details of the schemes relevant to the modelling for this study are:
- Possibility of two westbound lanes extending west of the crossroads on Gill Avenue to remove the existing 'bottleneck';
 - Possible widening of Gill Avenue eastbound to provide a third lane at the signal stop line, used for left turns into Egerton Road to the north;

- signalling the Tesco roundabout to allow better management of queuing on the A3 off-slip, including widening of the off-slip to provide a short section of three lanes at the signal stop line (LRN2).

5.3.8 There is also a committed Highways England scheme (SRN7) to widen the A3 off-slip to extend the length of the two-lane section from 165m to 285m (from 27 pcus to 47 pcus).

5.3.9 **Table 21** shows that the queue would no longer block back to the roundabout with the above improvements in place as it is less than 23 pcus. The results for 2014 are also included for comparison. In 2024, the junction is well within capacity (77%) and the Submission Local Plan results suggest further improvement but this is only because the signal green times are optimised and the key link received 2 seconds more.

5.3.10 **Table 22** shows how the A3 off-slip would perform with the signalised roundabout to manage the different traffic movements, again with 2014 for comparison. The slip road queue of 12 pcus with the Submission Local Plan traffic is much less than the length of the extended two-lane section, so the improvements should prevent blocking back onto the A3 main carriageway.

Table 21: Performance of Westbound Egerton Road with Improved Signalised Crossroads

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	72.2%	88.0%	77.4%	93.5%	73.2%	97.2%
Queue length (pcus)	15.6	14.6	17.5	17.9	16.8	21.7

Source: LINSIG results

Table 22: Performance of A3 Off-slip at Signalised Roundabout

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	62.9%	19.2%	56.8%	20.4%	66.3%	21.5%
Queue length (pcus)	11.2	2.8	10.7	3.0	12.3	3.2

Source: LINSIG results

5.3.11 The Cathedral roundabout was assessed with Junctions9, as the part-time signals were not in operation when observed in 2017 and no significant queuing was observed (other than that due to blocking back from the University roundabout). The results are shown in **Table 23** for the A3 off-slip arm into the roundabout, taking the worst 15-minute period over the peak hour. This shows minimal queuing in the Base Case and for 2024 with and without the Submission Local Plan trips.

Table 23: Performance of A3 Off-slip at Cathedral Roundabout

	2014 Base Case		2024 with Existing policy compliant sites		2024 with Existing policy compliant sites + Local Plan	
	AM	PM	AM	PM	AM	PM
Degree of saturation	83.8%	23.2%	89.1%	25.0%	89.9%	27.0%
Queue length (pcus)	2.4	0.3	2.9	0.3	3.0	0.3

Source: Junctions9 results

5.3.12 Therefore, it is concluded that the addition of the Submission Local Plan trips would not have a detrimental impact on the operation of the A3 at the University and Cathedral junctions. With the potential improvement schemes in place, as set out above, there would be a major benefit in increasing capacity at the University crossroads and preventing blocking back to the roundabout. This, combined with the signalisation of the Tesco roundabout, would significantly reduce the queue length on the A3 off-slip and should prevent blocking back onto the A3 main carriageway.

6 Merge and Diverge Analysis

6.1 Predicted Merge/Diverge Volumes

6.1.1 The predicted flows on the A3 and A3 slip roads are based on the average weekday flows for June 2016/17. They are shown in **Figures 17 - 20** for 2024 with existing policy compliant sites and for 2024 with the addition of Submission Local Plan developments.

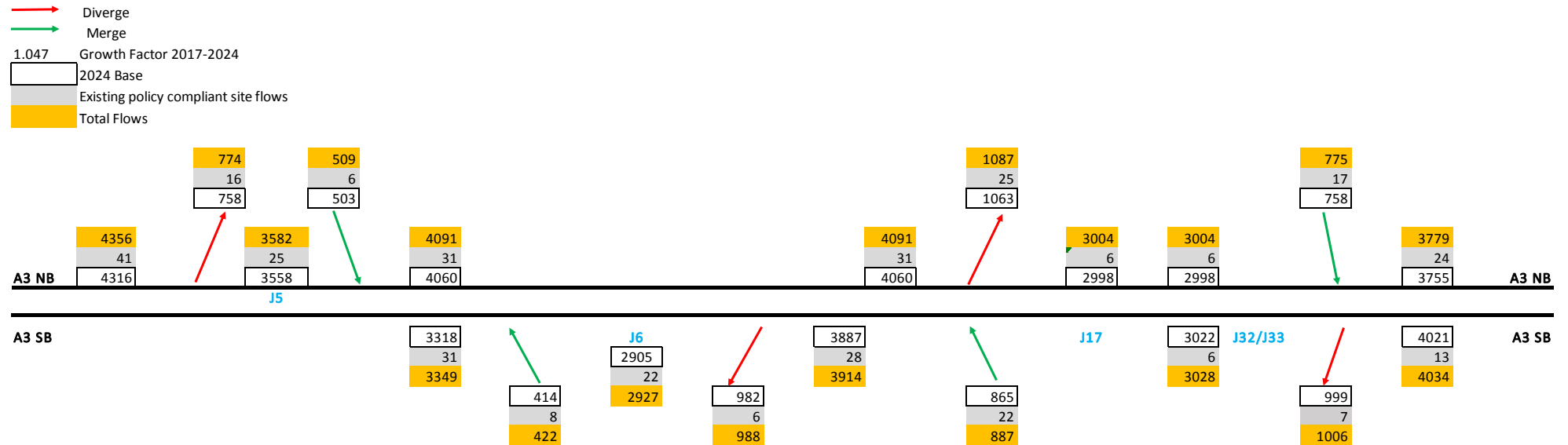
6.2 Merge/Diverge Layouts

6.2.1 **Figures 21-28** show an assessment of the recommended merge/diverge layout at each location on the A3, as set out in DMRB Volume 6, TD22/06. These are shown for 2024 with and without the Submission Local Plan development. In all cases, no change in layout is shown to be required due to the Submission Local Plan.

6.2.2 Given the relatively low additional merge/diverge trips with the Submission Local Plan, it is considered that the Submission Local Plan is unlikely to have a detrimental impact on the operation of junction merges and diverges.

6.2.3 Similarly, the low volumes of additional traffic should have no impact on peak spreading and should not result in a need for peak spreading to occur to accommodate these trips.

Figure 17: Merge/Diverge Flows – 2024 with Existing policy compliant sites AM Peak Hour



LEGEND

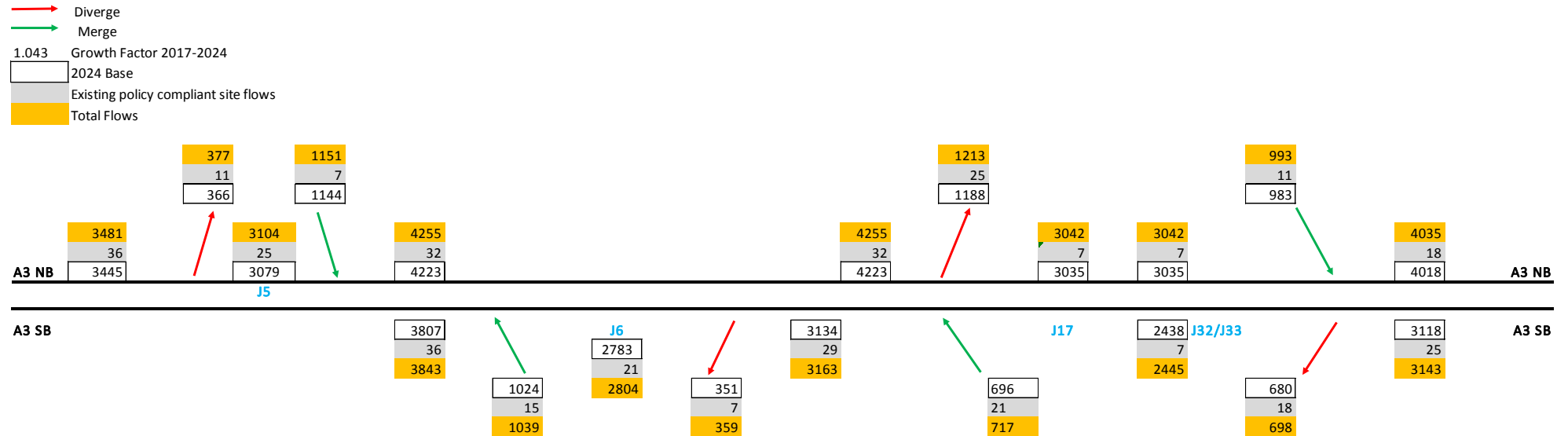
J5 – University Junction

J6 – Cathedral Junction

J17 – Dennis Junction

J32 – Stoke Junction

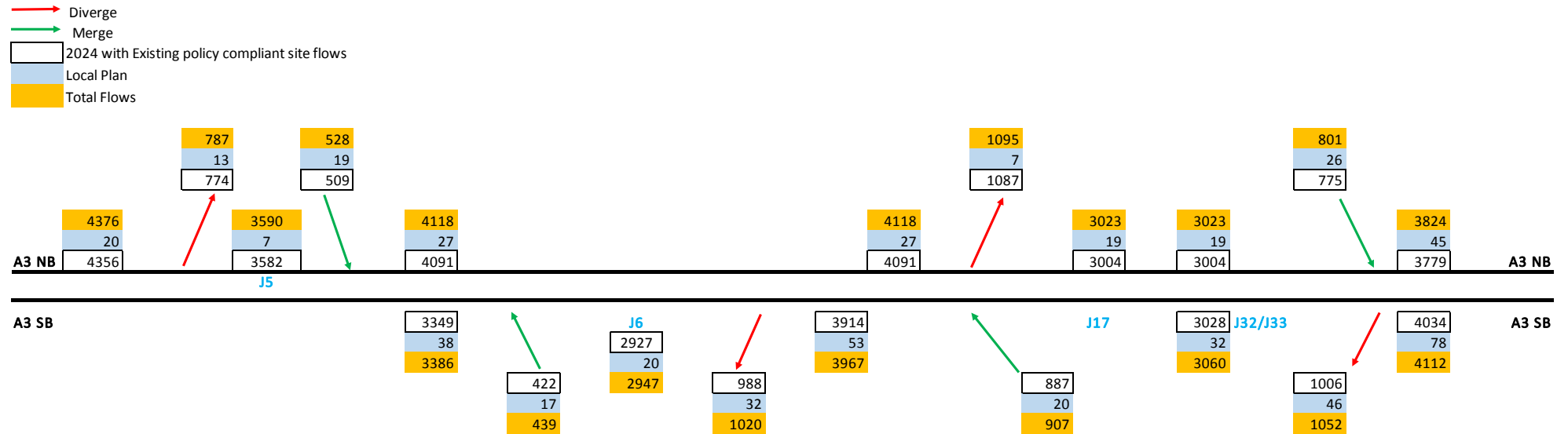
Figure 18: Merge/Diverge Flows – 2024 with Existing policy compliant sites PM Peak Hour



LEGEND

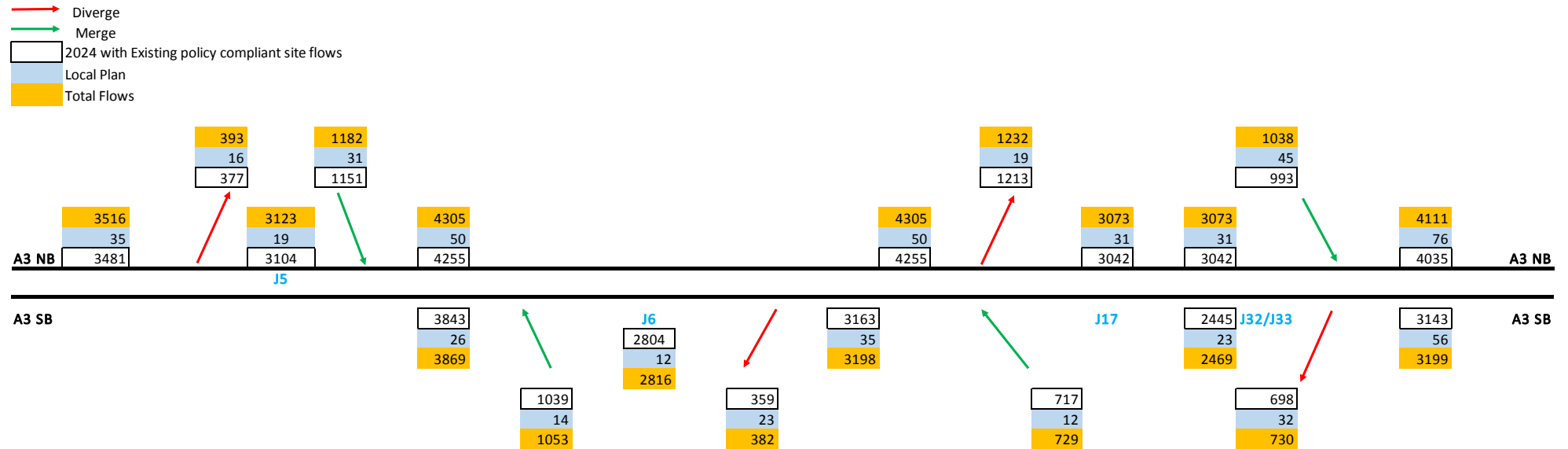
- J5 – University Junction
- J6 – Cathedral Junction
- J17 – Dennis Junction
- J32 – Stoke Junction

Figure 19: Merge/Diverge Flows – 2024 with Submission Local Plan Development AM Peak Hour



LEGEND
 J5 – University Junction
 J6 – Cathedral Junction
 J17 – Dennis Junction
 J32 – Stoke Junction

Figure 20: Merge/Diverge Flows – 2024 with Submission Local Plan Development PM Peak Hour



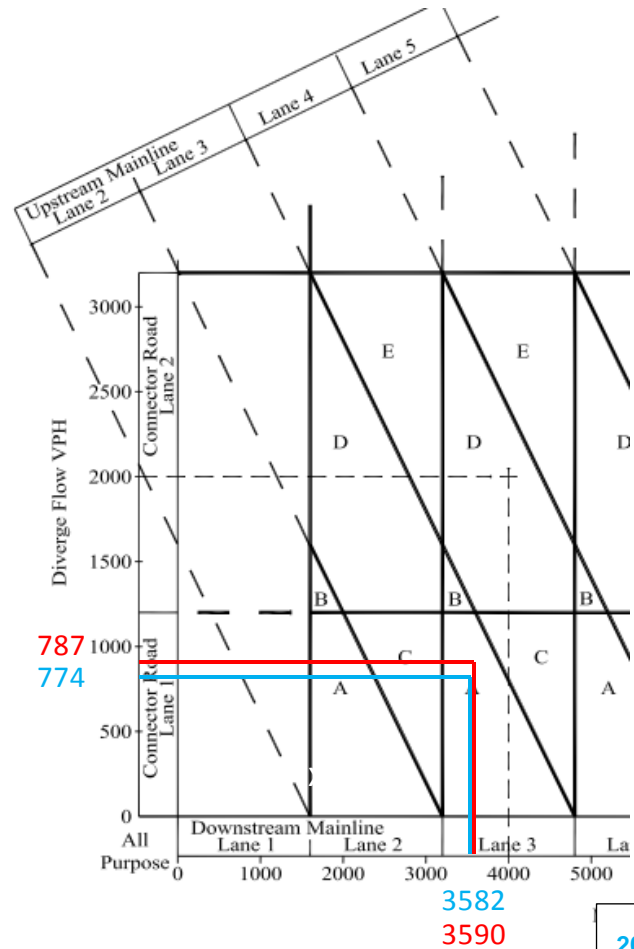
LEGEND

- J5 – University Junction
- J6 – Cathedral Junction
- J17 – Dennis Junction
- J32 – Stoke Junction

Figure 21: University Diverge/Merge Assessment - AM Peak Hour

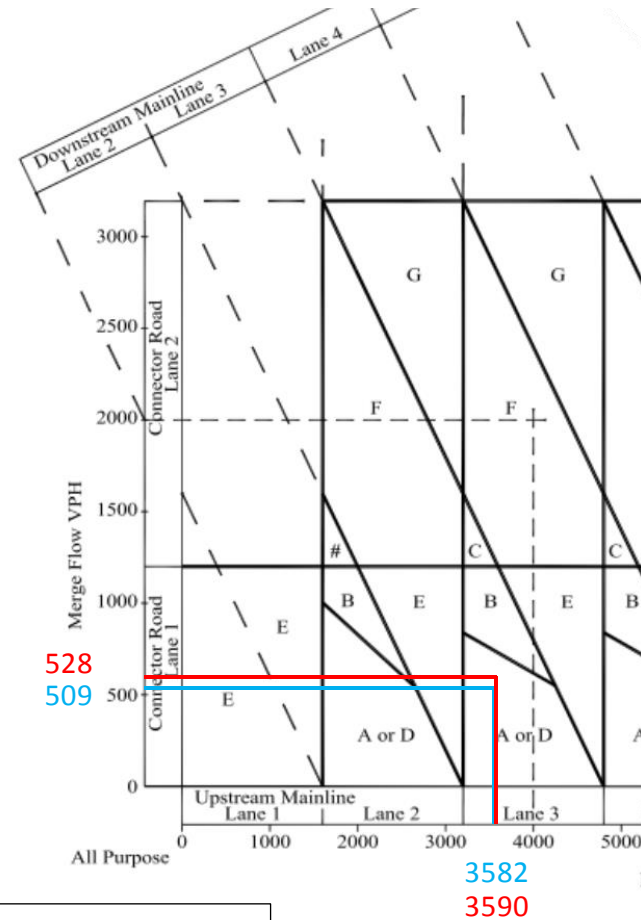
J5 Diverge - AM

Required: Taper diverge



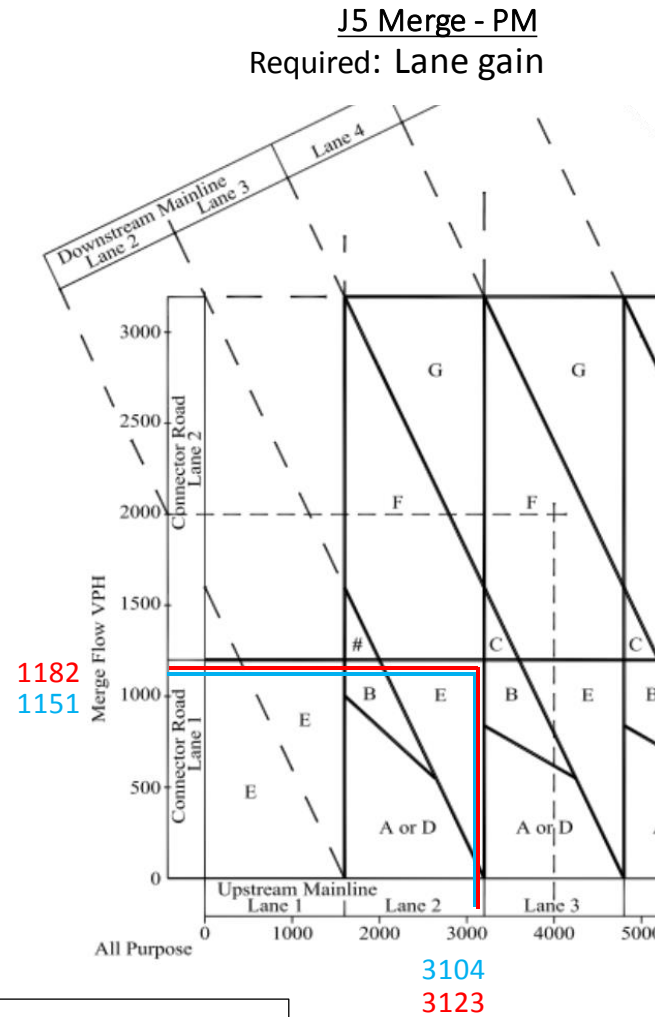
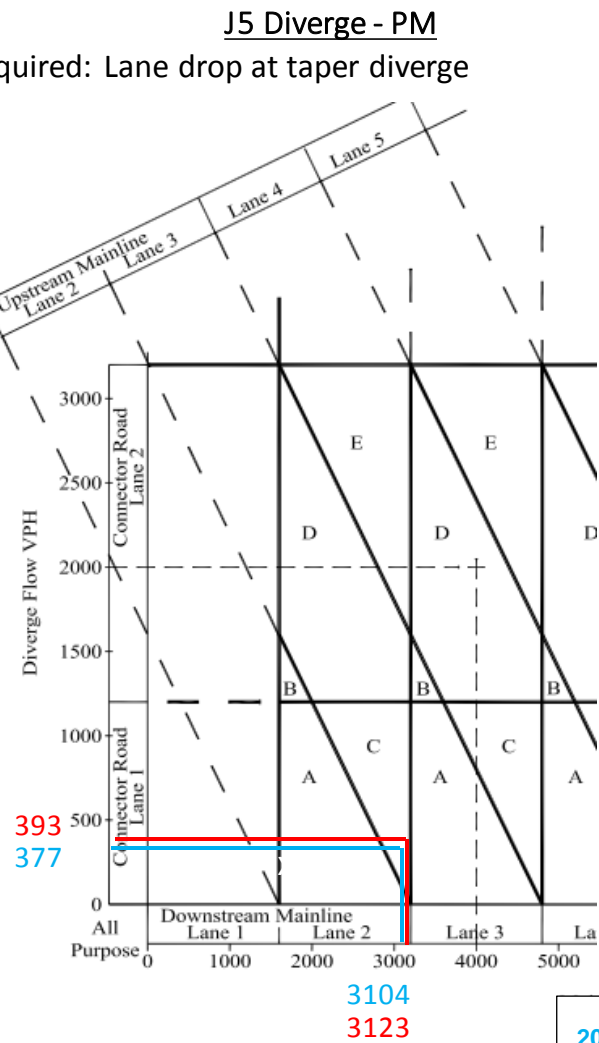
J5 Merge - AM

Required: Taper diverge/ 2 Lane urban merge



2024 with existing policy compliant sites
 2024 with Local Plan

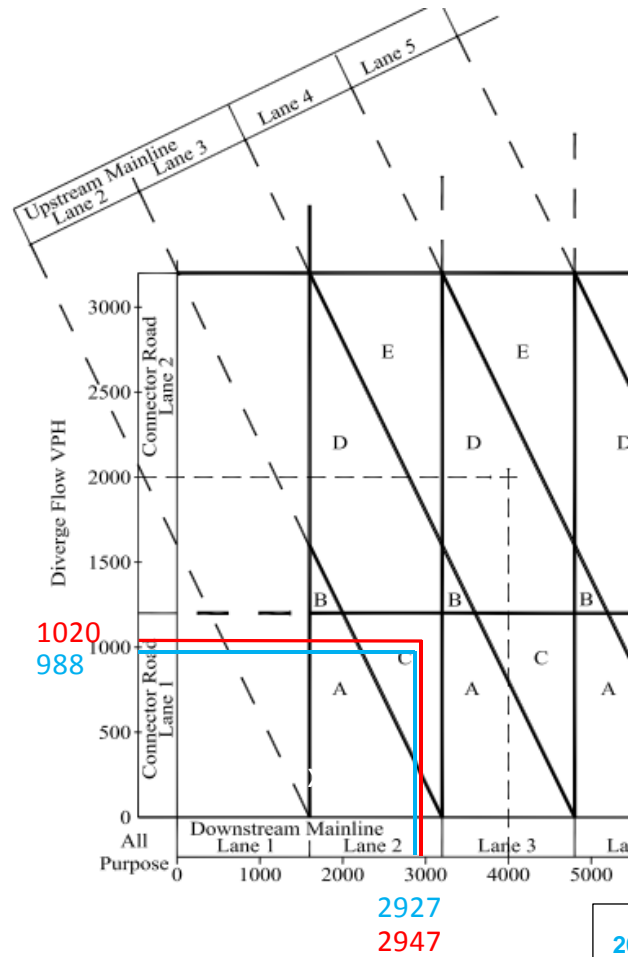
Figure 22: University Diverge/Merge Assessment - PM Peak Hour



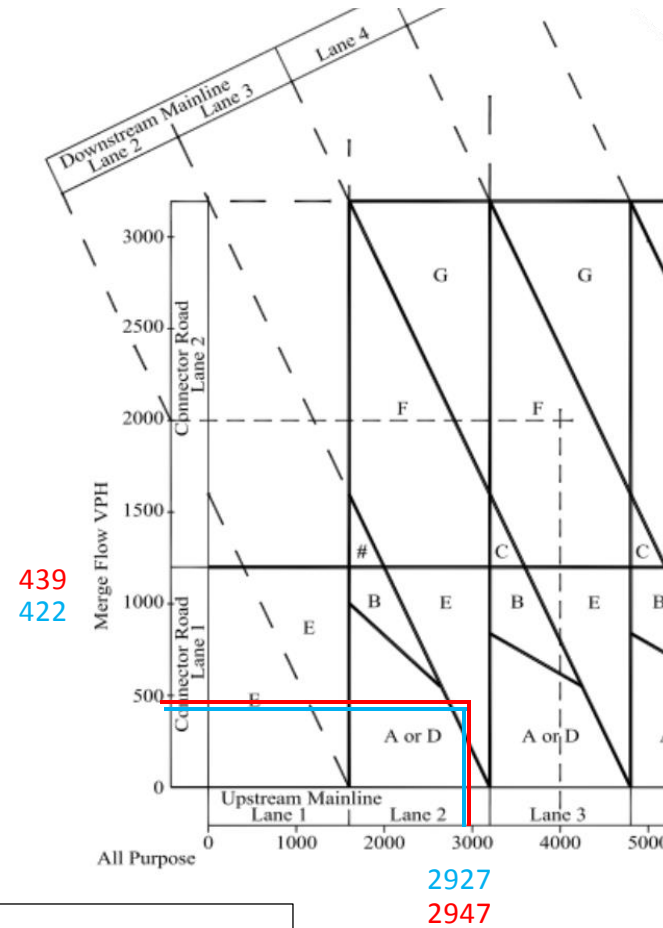
2024 with existing policy compliant sites
 2024 with Local Plan

Figure 23: Cathedral Diverge/Merge Assessment - AM Peak Hour

J6 Diverge - AM
 Required: Lane drop at taper diverge



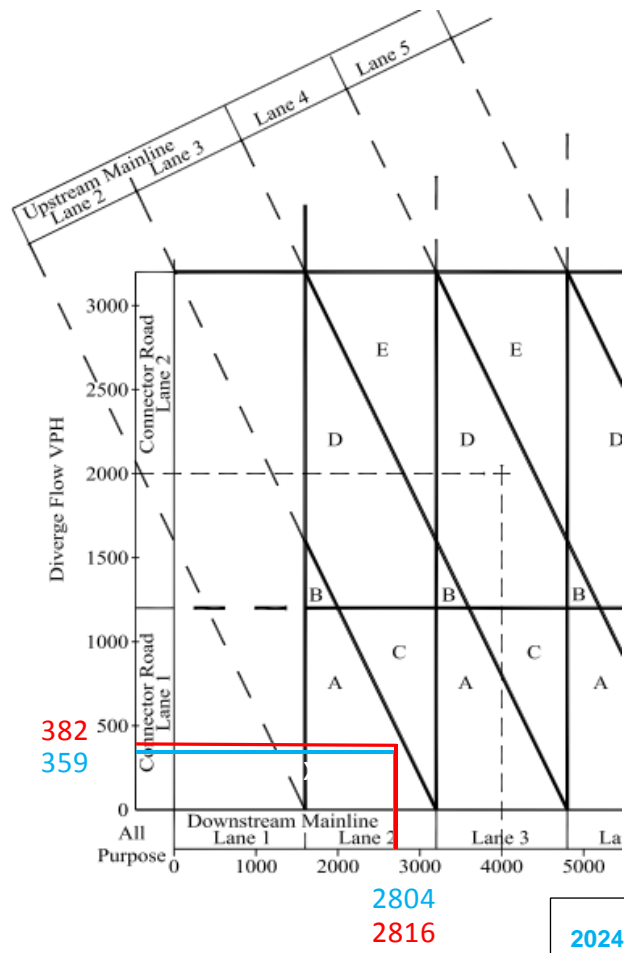
J6 Merge - AM
 Required: Lane gain



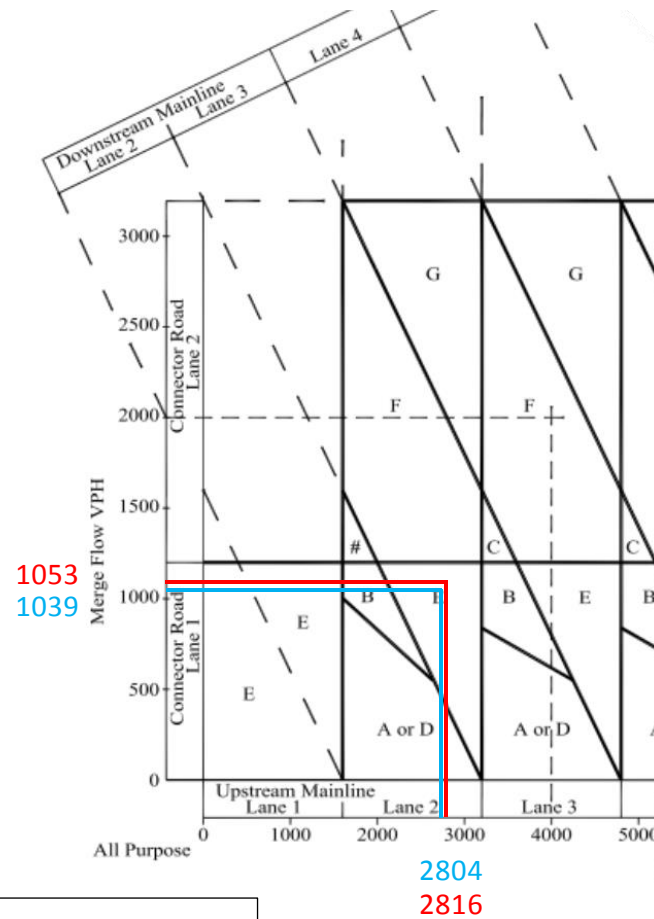
2024 with existing policy compliant sites
 2024 with Local Plan

Figure 24: Cathedral Diverge/Merge Assessment - PM Peak Hour

J6 Diverge - PM
 Required: Taper diverge



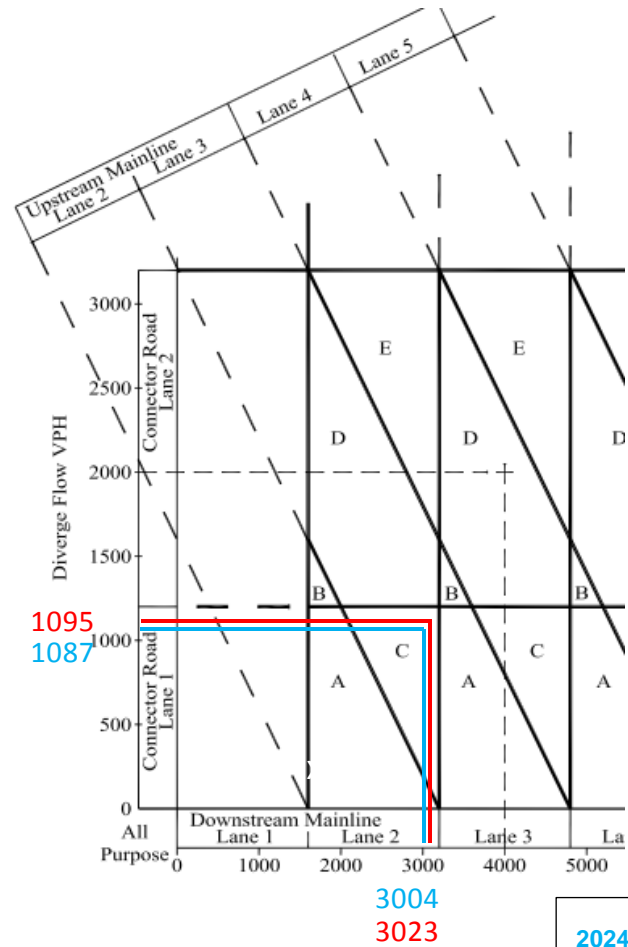
J6 Merge - PM
 Required: Lane gain



2024 with existing policy compliant sites
 2024 with Local Plan

Figure 25: Dennis Diverge/Merge Assessment - AM Peak Hour

J17 Diverge - AM
 Required: Lane drop at taper diverge



J17 Merge - AM
 Required: Lane gain

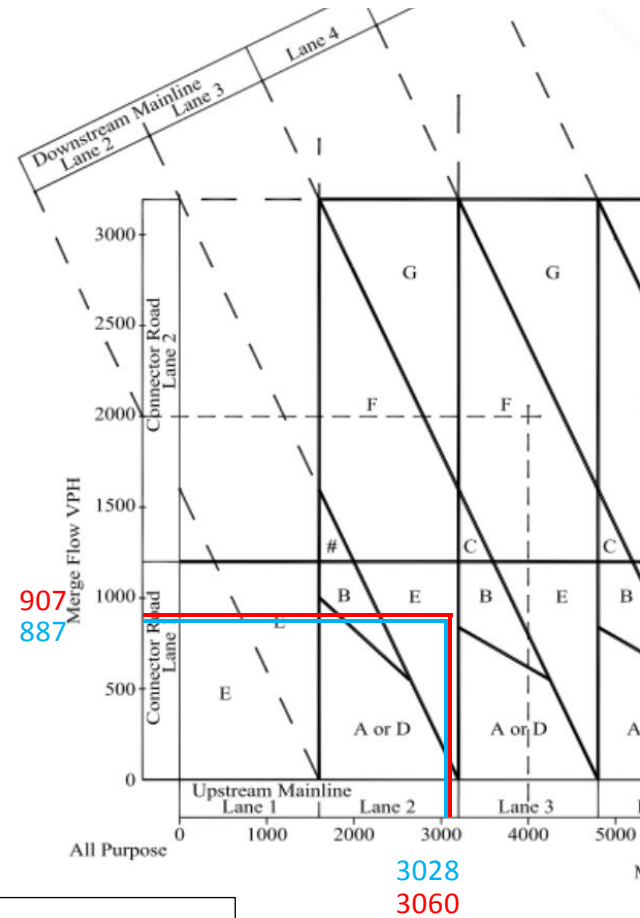
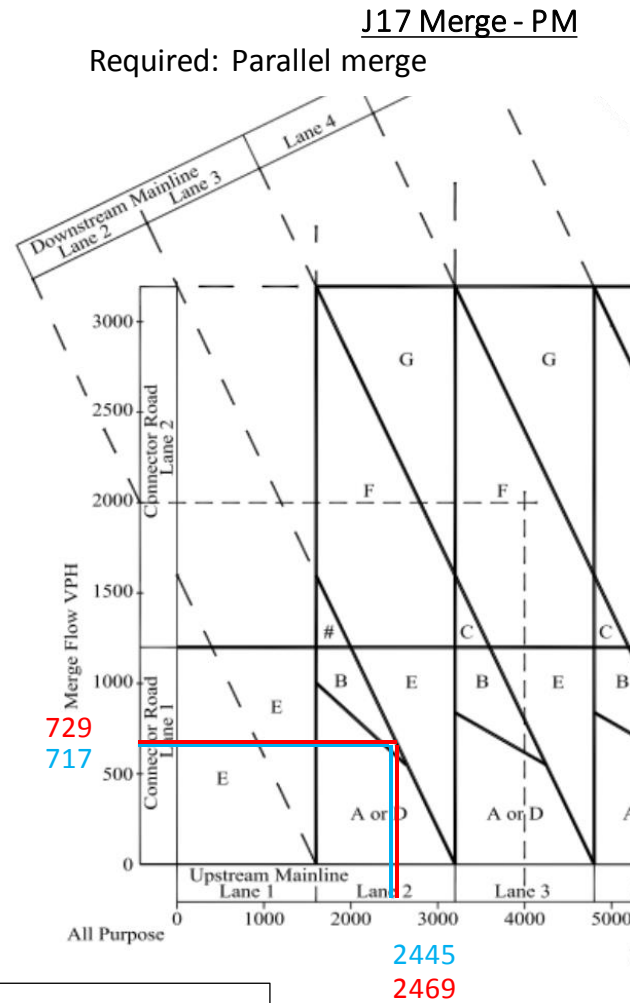
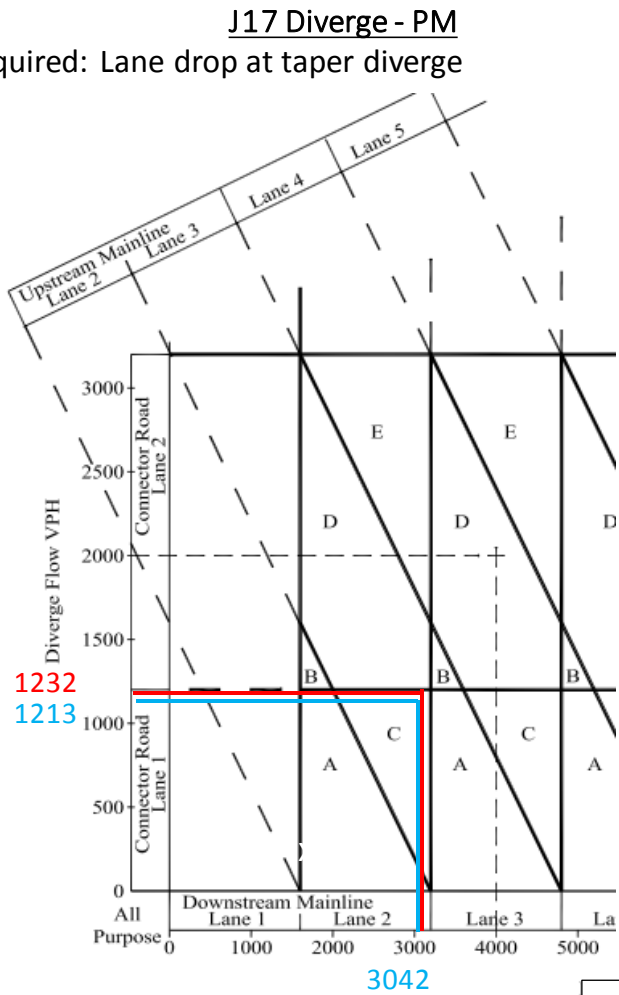


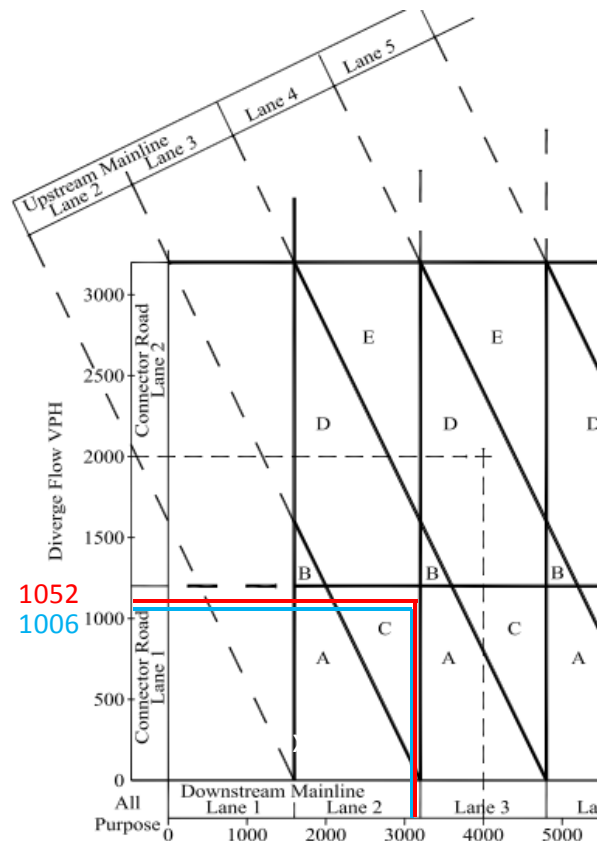
Figure 26: Dennis Diverge/Merge Assessment - PM Peak Hour



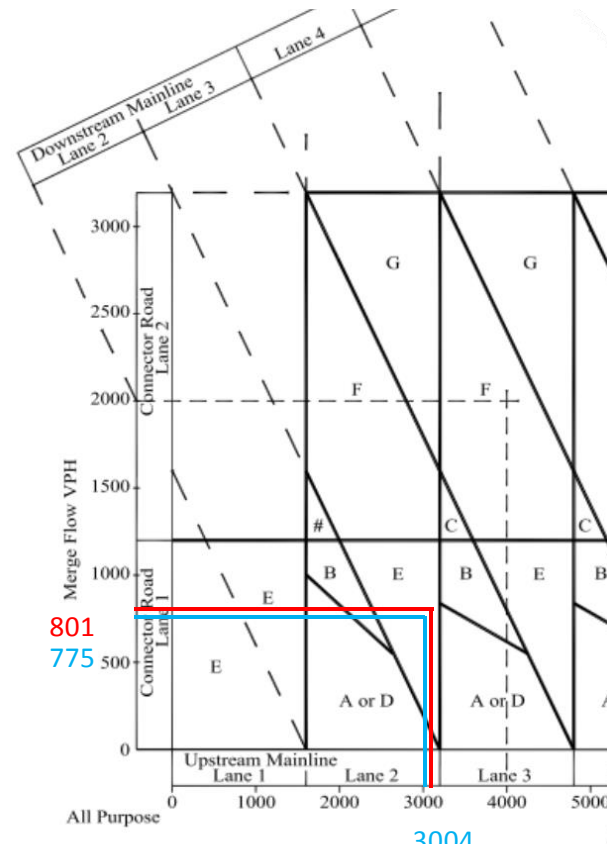
2024 with existing policy compliant sites
 2024 with Local Plan

Figure 27: Stoke Diverge/Merge Assessment - AM Peak Hour

J32 Diverge - AM
 Required: Lane drop at taper diverge



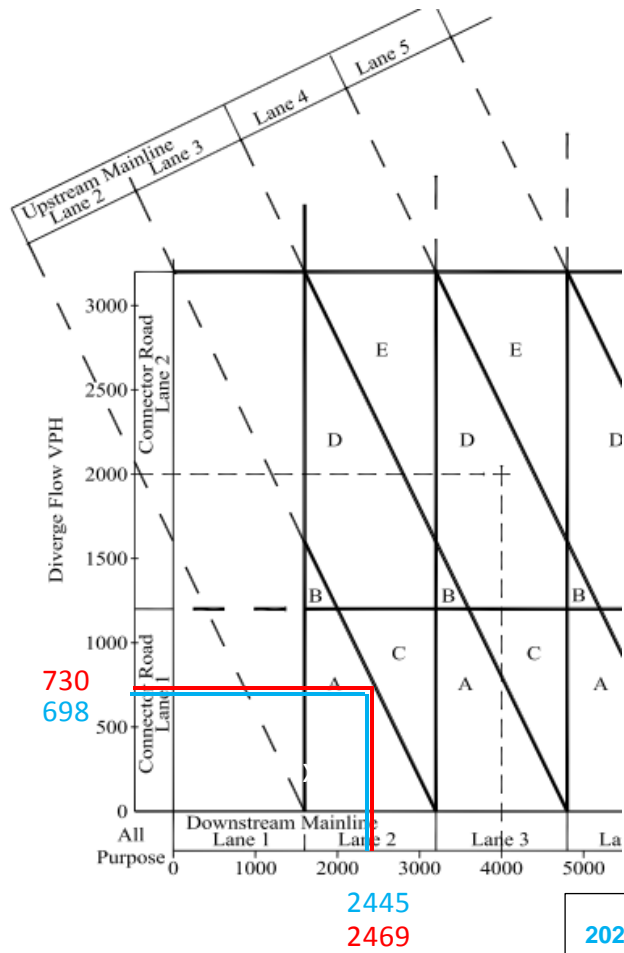
J32 Merge - AM
 Required: Lane gain



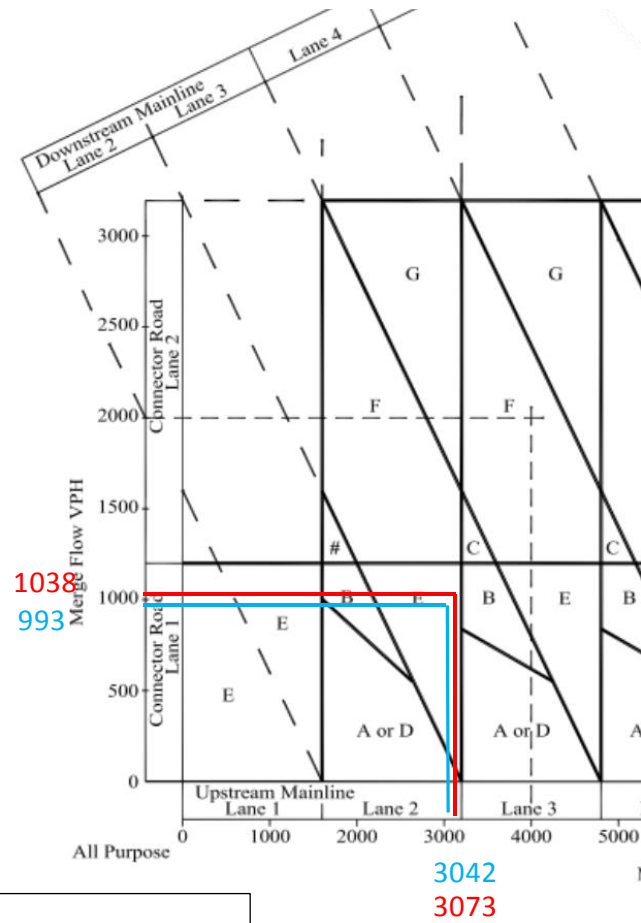
2024 with existing policy compliant sites
 2024 with Local Plan

Figure 28: Stoke Diverge/Merge Assessment - PM Peak Hour

J32 Diverge - PM
 Required: Taper diverge



J32 Merge - PM
 Required: Lane gain

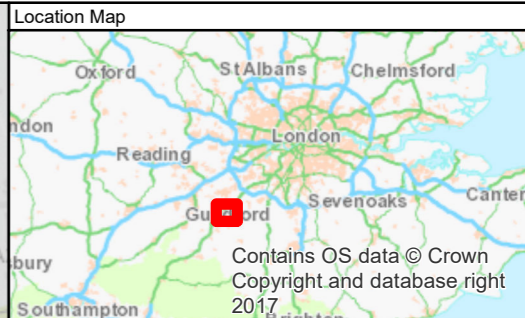
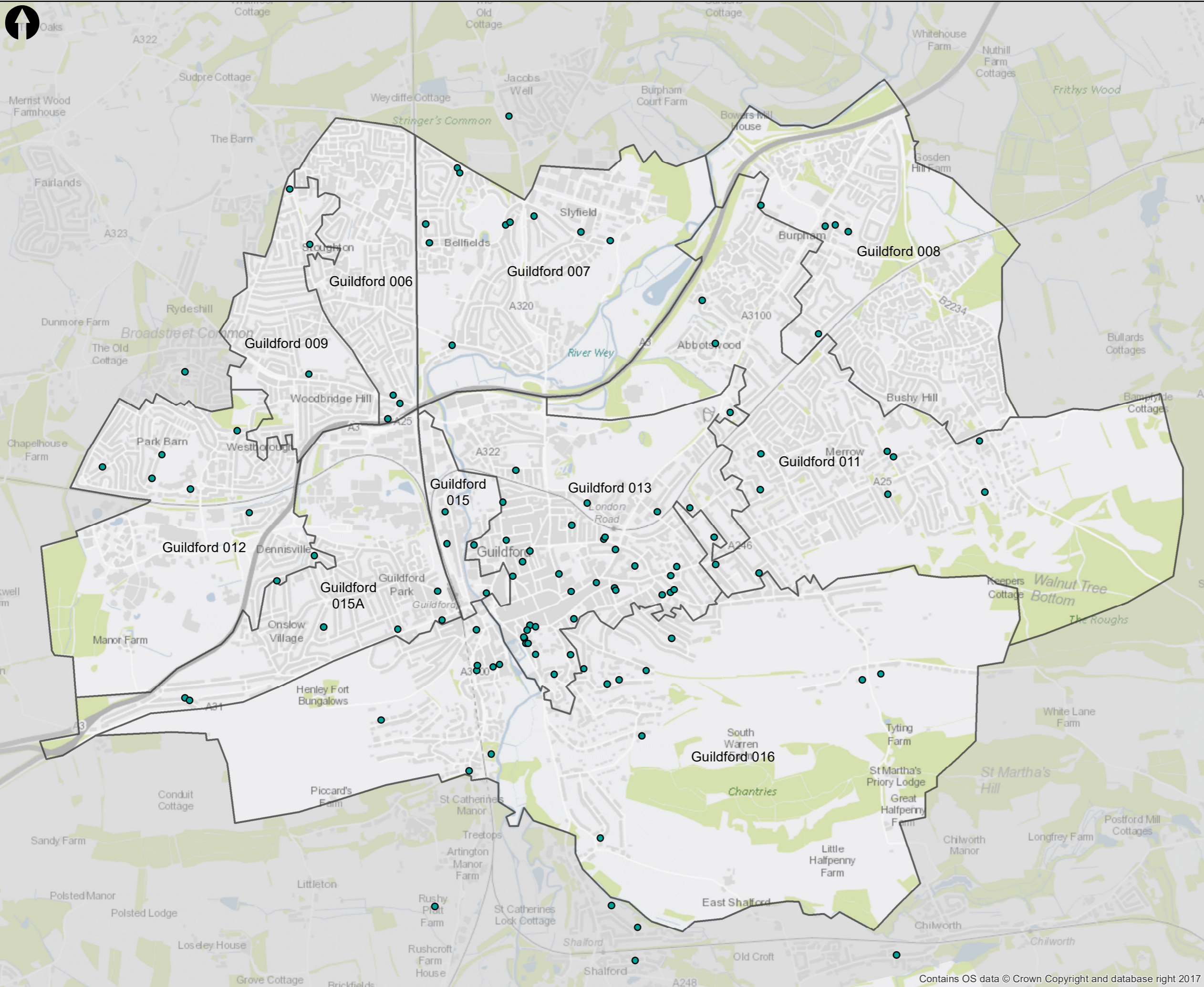


2024 with existing policy compliant sites
 2024 with Local Plan

Appendices

A.	Location of Development and Middle Super Output Area Zones	54
B.	Junction Movements Used by Trips between Census Areas	55
C.	Additional Trips on Junction Turning Movements for Each Development Type	56
D.	Proposed Improvements at the University Junctions	57

A. Location of Development and Middle Super Output Area Zones



Key to Symbols

- Guildford Middle Super Output Areas
- Base Developments 2014-2017

Notes

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P1	19/10/2017	RB	Development Mapping	MM	NH
Rev	Date	Drawn	Description	Ch'k'd	App'd
M			Mott MacDonald House 8-10 Sydenham Road Croydon, CR0 2EE United Kingdom T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com		

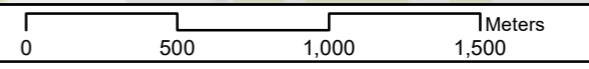
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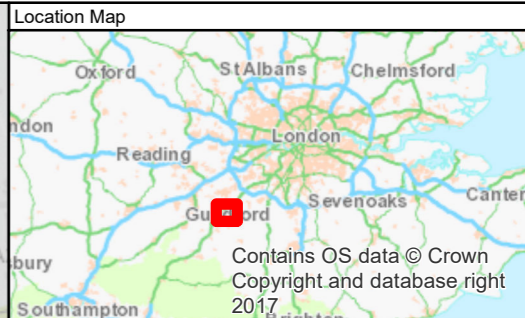
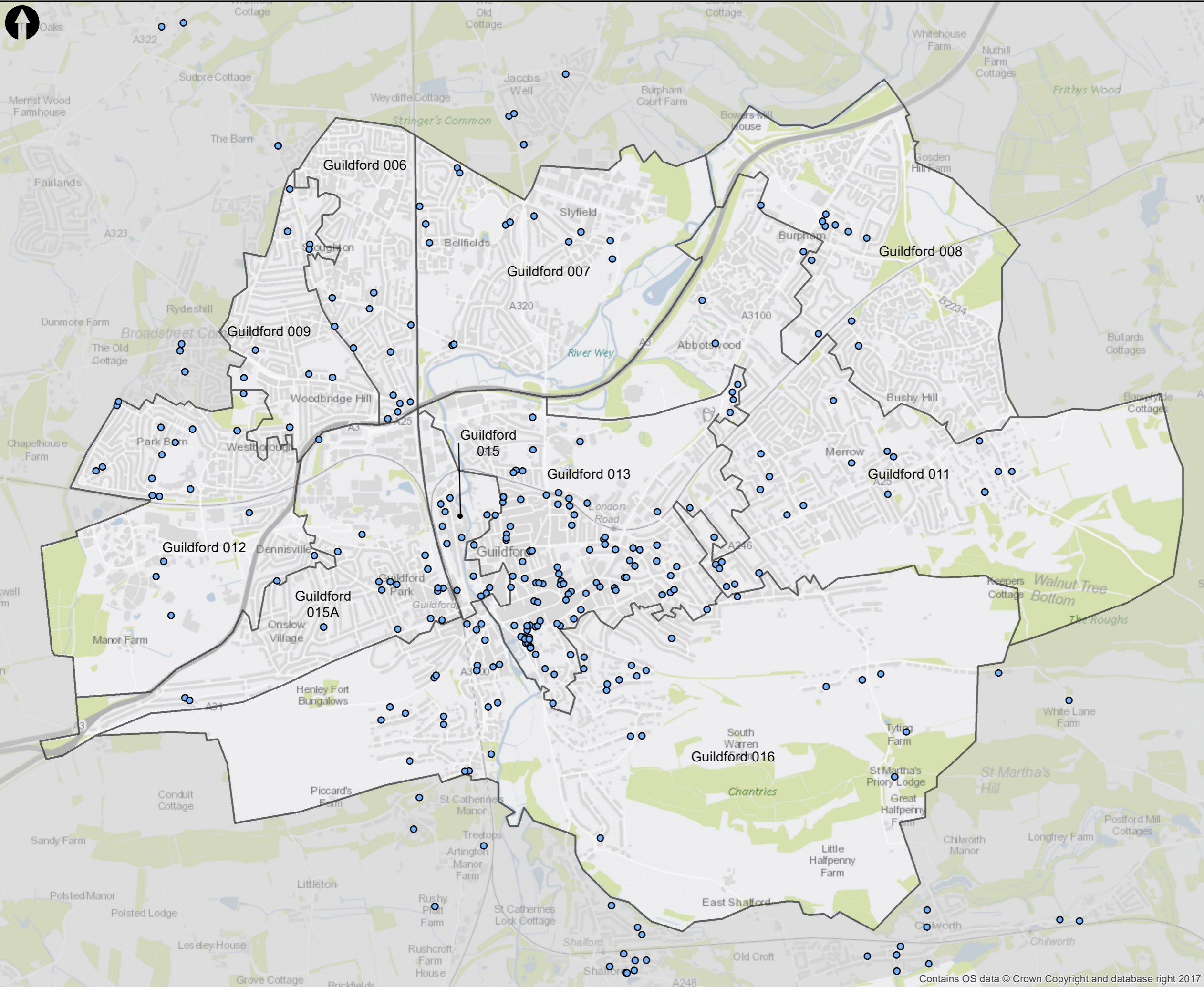
Guildford Borough Council

Title

**Guildford Borough
Development Mapping
Completions 2014-2017**

Designed	R Batten	Eng Check	
Drawn	R Batten	Coordination	
GIS Check		Approved	
Scale at A3	Status	Rev	Security
1:25,000	PRE	P1	STD





Key to Symbols

- Guildford Middle Super Output Areas
- Existing Policy Compliant Sites

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	19/10/2017	RB	Development Mapping	MM	NH
			<p>M M MOTT MACDONALD</p> <p>Mott MacDonald House 8-10 Sydenham Road Croydon, CR0 2EE United Kingdom T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com</p>		

Client

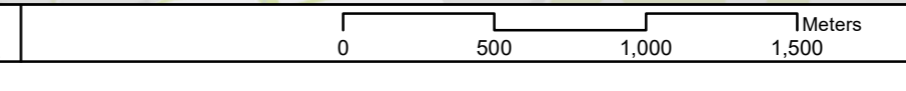
Guildford Borough Council

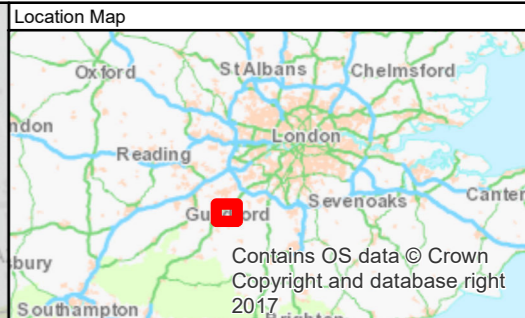
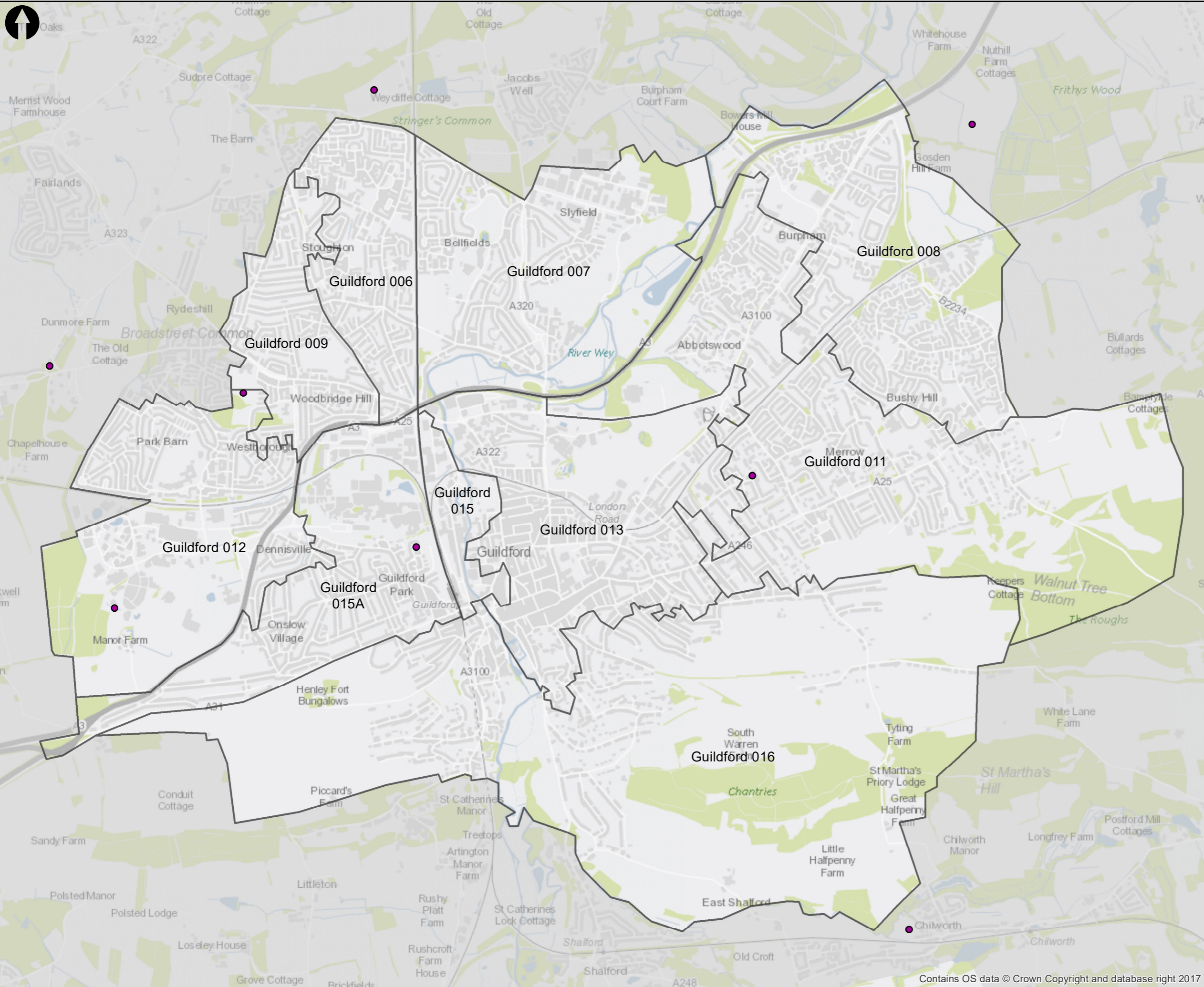


Title

Guildford Borough Development Mapping Existing Policy Compliant Sites

Designed	R Batten	Eng Check	
Drawn	R Batten	Coordination	
GIS Check		Approved	
Scale at A3	Status	Rev	Security
1:25,000	PRE	P1	STD





Key to Symbols

- Guildford Middle Super Output Areas
- Local Plan developments

Notes

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P1	19/10/2017	RB	Development Mapping	MM	NH
Rev	Date	Drawn	Description	Ch'k'd	App'd
M			Mott MacDonald House 8-10 Sydenham Road Croydon, CR0 2EE United Kingdom T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com		

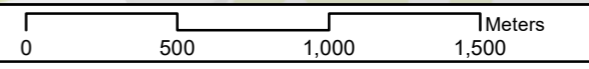
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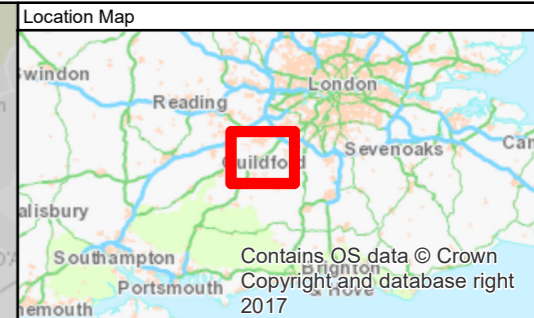
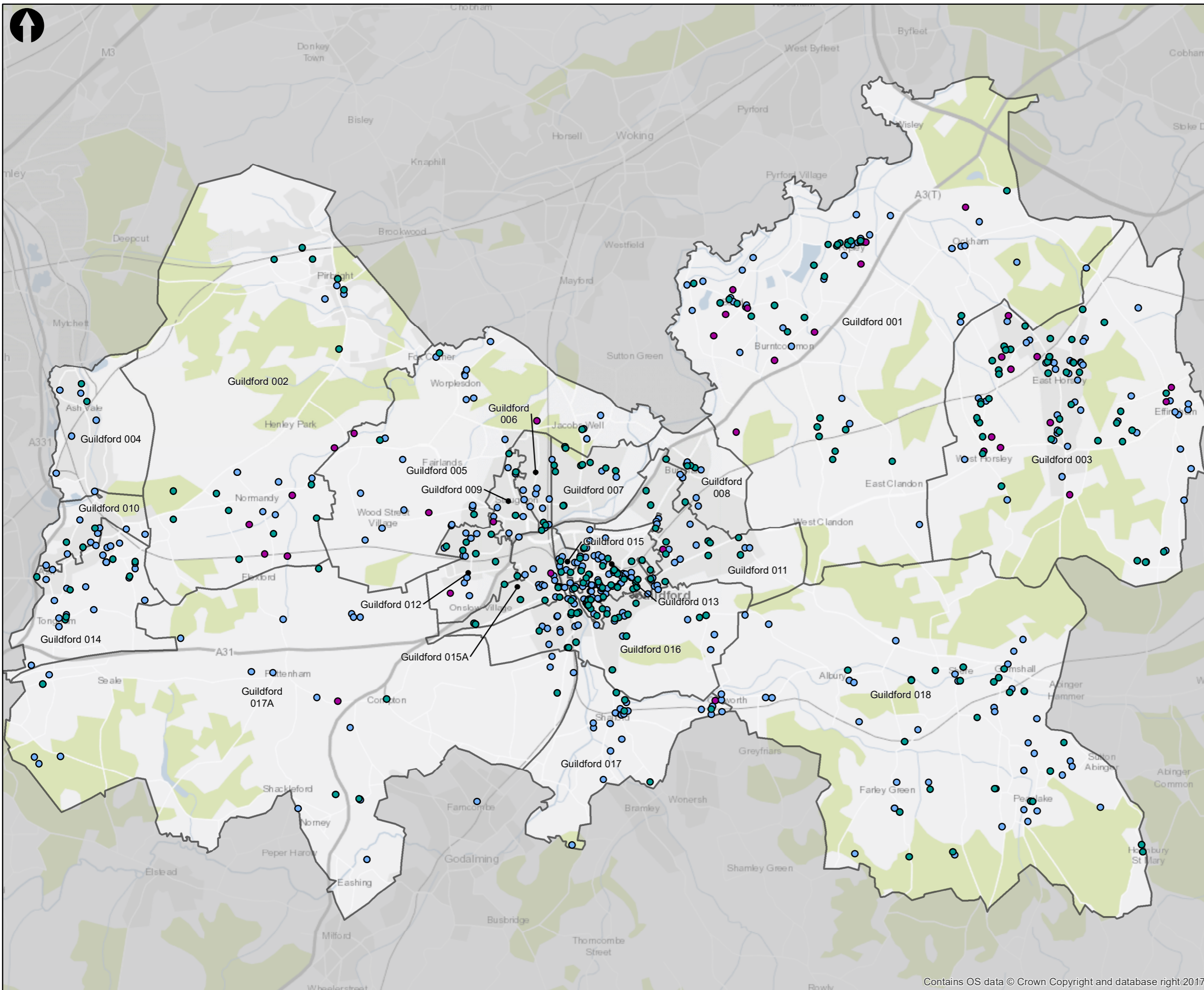
Guildford Borough Council

Title

**Guildford Borough
Development Mapping
Local Plan Developments**

Designed	R Batten	Eng Check	
Drawn	R Batten	Coordination	
GIS Check		Approved	
Scale at A3	Status	Rev	Security
1:25,000	PRE	P1	STD





Key to Symbols

- Base Developments 2014-2017
- Local Plan developments
- Existing Policy Compliant Sites
- Middle Super Output Areas

Notes

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P1	19/10/2017	RB	Development Mapping	MM	NH
Rev	Date	Drawn	Description	Ch'k'd	App'd
M			Mott MacDonald House 8-10 Sydenham Road Croydon, CR0 2EE United Kingdom T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com		

Client

Guildford Borough Council

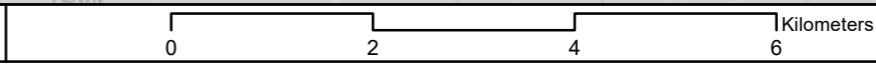
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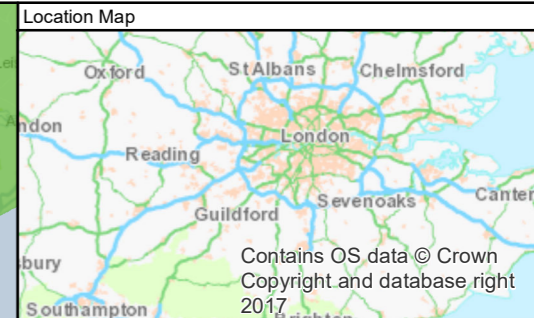
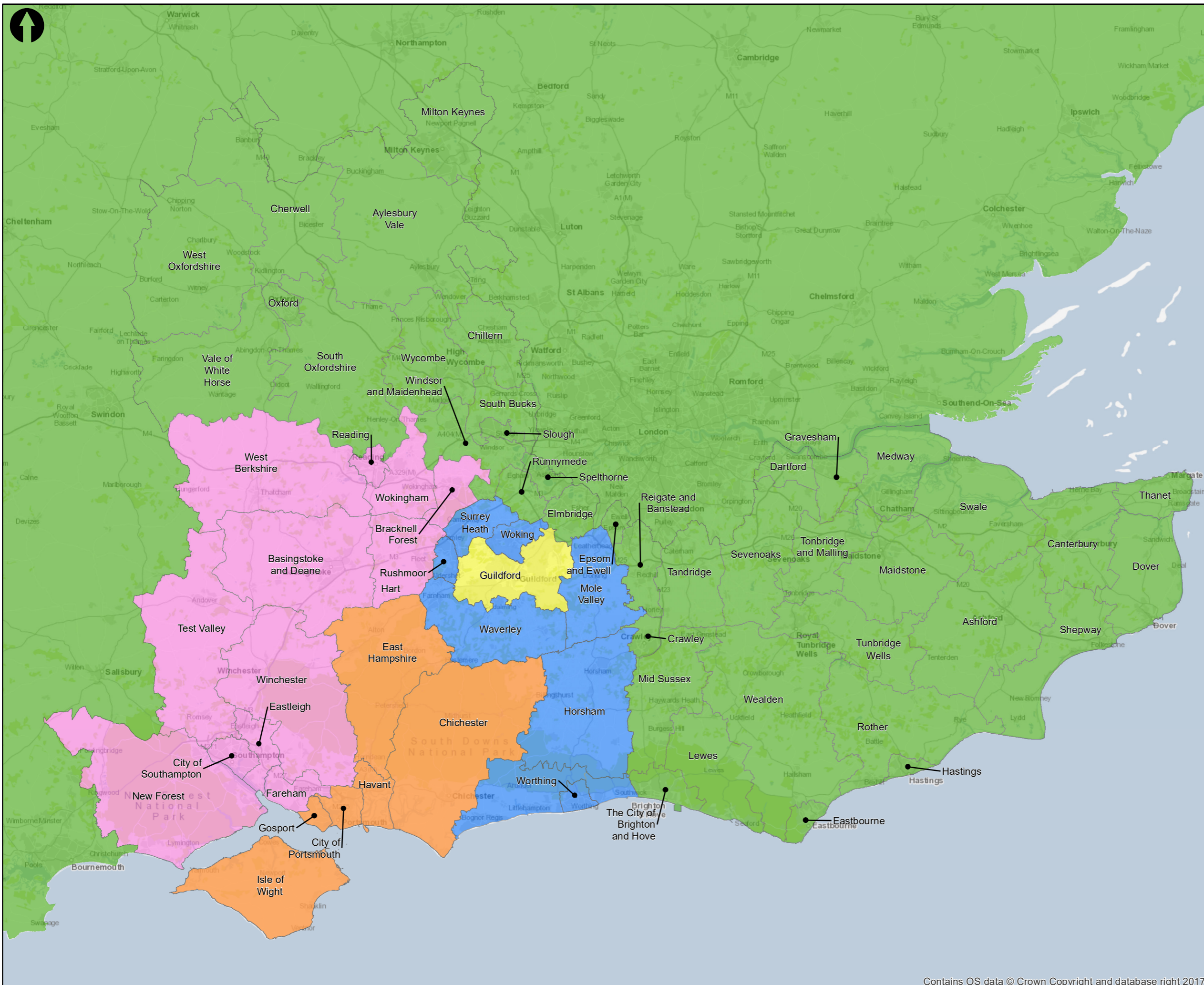
**Guildford Borough
Development Mapping
All Developments**

Designed	R Batten	Eng Check	
Drawn	R Batten	Coordination	
GIS Check		Approved	

Scale at A3	Status	Rev	Security
1:75,000	PRE	P1	STD

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Key to Symbols

- Not using A3
- Using Eastbound A31
- Using Southbound A3
- Using Northbound A3
- Other Distribution
- Guildford Distribution

Notes

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P1	19/10/2017	RB	Development Mapping	MM	NH
Rev	Date	Drawn	Description	Ch'k'd	App'd

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Guildford Borough Council

Title

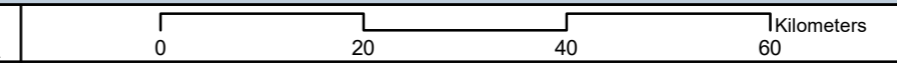
Guildford Borough Development Mapping A3 Usage

Designed	R Batten	Eng Check	
Drawn	R Batten	Coordination	
GIS Check		Approved	

Scale at A3	Status	Rev	Security
1:745,000	PRE	P1	STD

Drawing Number

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B. Junction Movements Used by Trips between Census Areas

to: Place of Work

from: Usual Residence	Guildford 001	Guildford 002	Guildford 003	Guildford 004	Guildford 005	Guildford 006	Guildford 007	Guildford 008	Guildford 009	Guildford 010
Surrey Heath 001										
Surrey Heath 002										
Surrey Heath 003										
Surrey Heath 004					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 005					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 006										
Surrey Heath 007					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 008					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 009					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 010					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 011					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Surrey Heath 012										
Adur	33EC, 32CA				17BA	17BA	33EC, 32CA		17BA	
Arun	33EC, 32CA				17BA	17BA	33EC, 32CA		17BA	
Ashford						32BA	32BA		32BC, 33CF, 17BA	
Aylesbury Vale						32BA	32BA		32BC, 33CF, 17BA	
Basingstoke and Deane					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Bracknell Forest					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Brighton and Hove						32BA	32BA		32BC, 33CF, 17BA	
Canterbury						32BA	32BA		32BC, 33CF, 17BA	
Cherwell						32BA	32BA		32BC, 33CF, 17BA	
Chichester					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Chiltern						32BA	32BA		32BC, 33CF, 17BA	
Crawley						32BA	32BA		32BC, 33CF, 17BA	
Dartford						32BA	32BA		32BC, 33CF, 17BA	
Dover						32BA	32BA		32BC, 33CF, 17BA	
East Hampshire					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Eastbourne						32BA	32BA		32BC, 33CF, 17BA	
Eastleigh					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Elmbridge						32BA	32BA		32BC, 33CF, 17BA	
Epsom and Ewell						32BA	32BA		32BC, 33CF, 17BA	
Fareham					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Gosport					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Gravesham						32BA	32BA		32BC, 33CF, 17BA	
Hart					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Hastings						32BA	32BA		32BC, 33CF, 17BA	
Havant					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Horsham	33EC, 32CA				17BA	17BA	33EC, 32CA		17BA	
Isle of Wight					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Lewes						32BA	32BA		32BC, 33CF, 17BA	
Maidstone						32BA	32BA		32BC, 33CF, 17BA	
Medway						32BA	32BA		32BC, 33CF, 17BA	
Mid Sussex						32BA	32BA		32BC, 33CF, 17BA	
Milton Keynes						32BA	32BA		32BC, 33CF, 17BA	
Mole Valley					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
New Forest					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Oxford					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	

to: Place of Work




from: Usual Residence	Guildford 001	Guildford 002	Guildford 003	Guildford 004	Guildford 005	Guildford 006	Guildford 007	Guildford 008	Guildford 009	Guildford 010
Portsmouth					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Reading					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Reigate and Banstead						32BA	32BA		32BC, 33CF, 17BA	
Rother						32BA	32BA		32BC, 33CF, 17BA	
Runnymede						32BA	32BA		32BC, 33CF, 17BA	
Rushmoor				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Sevenoaks						32BA	32BA		32BC, 33CF, 17BA	
Shepway						32BA	32BA		32BC, 33CF, 17BA	
Slough						32BA	32BA		32BC, 33CF, 17BA	
South Bucks						32BA	32BA		32BC, 33CF, 17BA	
South Oxfordshire						32BA	32BA		32BC, 33CF, 17BA	
Southampton					17DA	17DA	17DB, 33FC, 32CA	17DB, 33FD	17DA	
Spelthorne				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Swale						32BA	32BA		32BC, 33CF, 17BA	
Tandridge						32BA	32BA		32BC, 33CF, 17BA	
Test Valley				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Thanet						32BA	32BA		32BC, 33CF, 17BA	
Tonbridge and Malling						32BA	32BA		32BC, 33CF, 17BA	
Tunbridge Wells						32BA	32BA		32BC, 33CF, 17BA	
Vale of White Horse						32BA	32BA		32BC, 33CF, 17BA	
Wealden						32BA	32BA		32BC, 33CF, 17BA	
West Berkshire				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
West Oxfordshire						32BA	32BA		32BC, 33CF, 17BA	
Winchester				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Windsor and Maidenhead						32BA	32BA		32BC, 33CF, 17BA	
Wokingham				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Worthing	33EC, 32CA			17BA	17BA	33EC, 32CA			17BA	
Wycombe						32BA	32BA		32BC, 33CF, 17BA	
East				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
East Midlands				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
London				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
North East				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
North West				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
South West				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Wales				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
West Midlands				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	
Yorkshire and The Humber				17DA	17DA	17DB, 33FC, 32CA		17DB, 33FD	17DA	

to: Place of Work

from: Usual Residence	Guildford 011	Guildford 012	Guildford 013	Guildford 014	Guildford 015	Guildford 015A	Guildford 016	Guildford 017	Guildford 017A	Guildford 018
Guildford 001		6AD, 5BE, 4BA	32BC, 33CE		32BC, 33CF	6AC	32BC, 33CE	32BC, 33CE		
Guildford 002			17AB		17AB	6AC, 17AD				
Guildford 003		6AD, 5BE, 4BA				6AC				
Guildford 004										
Guildford 005			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Guildford 006	32AC, 33CD		17AB	17AD	17AB	17AD, 6AC	17AB	17AB	17AD	32AC, 33CD
Guildford 007	32AC, 33CD		32AC, 33CE	32AC, 33CF, 17BD	32AC, 33CF	32AC, 33CF, 17BD, 6AC	32AC, 33CE	32AC, 33CE	32AC, 33CE	
Guildford 008		33DF, 17BA		33DF, 17BD						
Guildford 009	17AB, 33FD		17AB	17AD	17AB	17AD, 6AC	17AB	17AB	17AD	17AB, 33FD
Guildford 010	17DB, 33FD	5CE, 4BA								
Guildford 011		33DF, 17BA								
Guildford 012	17AB, 33FD		4AB, 5EB, 6DC	4AB, 5EB, 6DA	17AB	4AB, 5EB, 6DC	4AB, 5EB, 6DC	4AB, 5EB, 6DC	4AB, 5EB, 6DA	4AB, 5EB, 6DC
Guildford 013		6CD, 5BE, 4BA								
Guildford 014		5CE, 4BA								
Guildford 015		17BA								
Guildford 015A		6CD, 5BE, 4BA								
Guildford 016		6CD, 5BE, 4BA								
Guildford 017		6CD, 5BE, 4BA								
Guildford 017A		5CE, 4BA								
Guildford 018		6CD, 5BE, 4BA								
Waverley 001	17DB, 33FD	5CE, 4BA								
Waverley 002	17DB, 33FD	5CE, 4BA								
Waverley 003	17DB, 33FD	5CE, 4BA								
Waverley 004	17DB, 33FD	5CE, 4BA								
Waverley 005										
Waverley 006	17DB, 33FD	5CE, 4BA								
Waverley 007										
Waverley 008										
Waverley 009	17DB, 33FD	5CE, 4BA								
Waverley 010										
Waverley 011	17DB, 33FD	5CE, 4BA								
Waverley 012	17DB, 33FD	5CE, 4BA								
Waverley 013										
Waverley 014	17DB, 33FD	5CE, 4BA								
Waverley 015	17DB, 33FD	5CE, 4BA								
Waverley 016	17DB, 33FD	5CE, 4BA								
Waverley 017	17DB, 33FD	5CE, 4BA								
Woking 001		6AD, 5BE, 4BA	32BC, 33CE		32BC, 33CF	6AC	32BC, 33CE	32BC, 33CE		
Woking 002		6AD, 5BE, 4BA	32BC, 33CE		32BC, 33CF	6AC	32BC, 33CE	32BC, 33CE		
Woking 003			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 004			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 005			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 006			32AC, 33CE		32BC, 33CF	6AC	32BC, 33CE	32BC, 33CE		
Woking 007			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 008			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 009			17AB		17AB	17AD, 6AC	17AB	17AB	17AD	
Woking 010			32AC, 33CE		32AC, 33CF	32AC, 33CF, 17BD, 6AC	32AC, 33CE	32AC, 33CE	17BD, 32AC, 33CF	
Woking 011			32AC, 33CE		32BC, 33CF	6AC	32BC, 33CE	32BC, 33CE		
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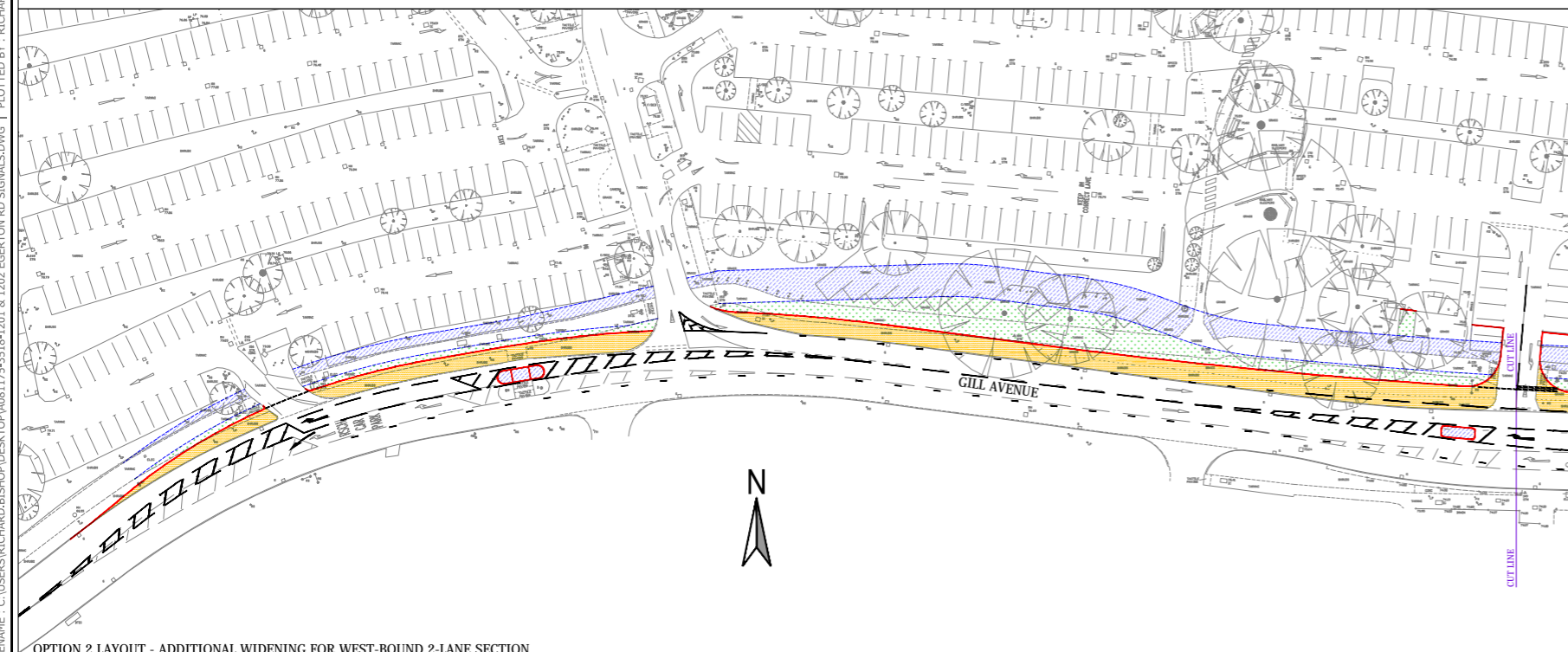
C. Additional Trips on Junction Turning Movements for Each Development Type

D. Proposed Improvements at the University Junctions

KEY	
	NEW CARRIAGEWAY WIDENING
	NEW FOOTWAY CONSTRUCTION
	NEW VERGE



OPTION 1 LAYOUT - MINIMAL WIDENING FOR WEST-BOUND 2-LANE SECTION



OPTION 2 LAYOUT - ADDITIONAL WIDENING FOR WEST-BOUND 2-LANE SECTION

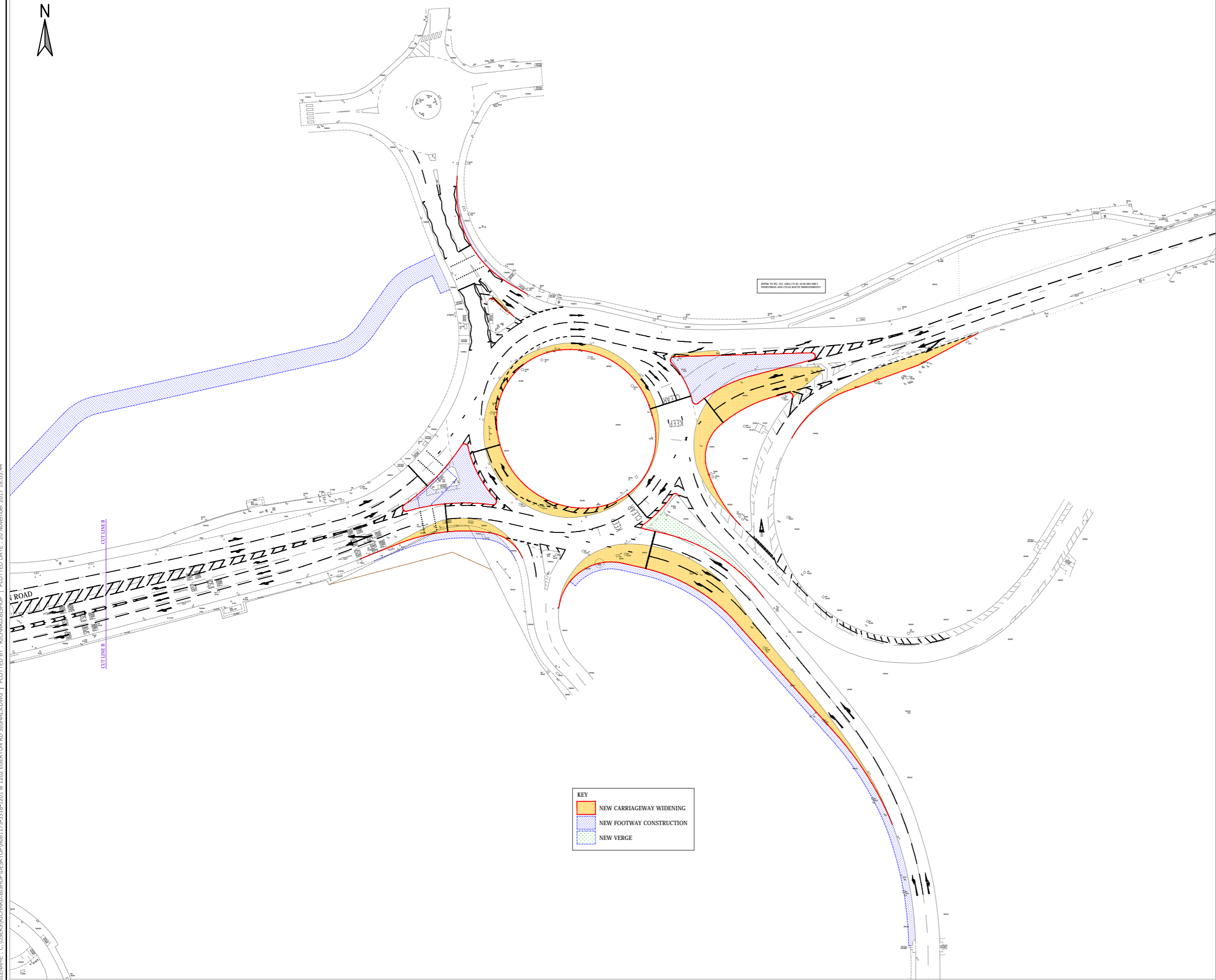
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Project:					
GUILDFORD SUSTAINABLE MOVEMENT CORRIDORS					
Drawing Title:					
SMC 1					
GILL AVENUE & ERGERTON ROAD JUNCTION					
HIGHWAYS IMPROVEMENT					
Scale @ A3	Drawn	Date	Checked	Date	Approved
1:500	RB	21.11.17	AC	20.11.17	CRS
Project No.	Office	Type	Drawing No.	Revision	
A081175-81	35	18	1201	-	




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 LE77GR
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 e-mail: leicester@wyg.com



Scale @ A3	Drawn	Date	Checked	Date	Approved
1:500	RB	21.11.17	AC	20.11.17	CRS
Project No.	Office	Type	Drawing No.	Revision	
A081175-81	35	18	1201	-	

FILENAME: C:\USERS\RICHARD.BISHOP\DESKTOP\A081175-3518-1201 & 1202 EGERTON RD SIGNALS.DWG | PLOTTED BY: RICHARD.BISHOP | PLOTTED DATE: 20 November 2017 18:06:54



KEY	
	NEW CARRIAGEWAY WIDENING
	NEW FOOTWAY CONSTRUCTION
	NEW VERGE

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REV	DESCRIPTION	BY	CHK	APP	DATE
Client:					
GUILDFORD BOROUGH COUNCIL					
Project:					
GUILDFORD SUSTAINABLE MOVEMENT CORRIDORS					
Drawing Title:					
SMC 1					
ERGERTON ROAD / A3 ROUNDABOUT					
HIGHWAYS IMPROVEMENT					
Scale @ A3	Drawn	Date	Checked	Date	Approved
1:500	RB	21.11.17	AC	20.11.17	CRS
Project No.	Office	Type	Drawing No.	Revision	
A081175-81	35	18	1202	-	

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Project:
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Drawing Title:
 SMC 1
 ERGERTON ROAD / A3 ROUNDABOUT
 HIGHWAYS IMPROVEMENT

Scale @ A3	Drawn	Date	Checked	Date	Approved
1:500	RB	21.11.17	AC	20.11.17	CRS
Project No.	Office	Type	Drawing No.	Revision	
A081175-81	35	18	1202	-	

