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COUNTY COUNCIL
Transport and Highways

REIGATE & BANSTEAD BOROUGH-WIDE TRAFFIC MODELLING 2009-2026

Core Strategy Transport Assessment Report February 2012

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GLOSSARY OF TERMS

Acronym	Full Name	Definition
Burrell Assignment		Assigns trips to the modelled highway network using estimates of the shortest path based on Monte Carlo Sampling.
Capacity		The maximum rate of traffic flow passing a given point in same direction per unit time under prevailing conditions.
Congestion		Condition of the highway network that occurs as use increases, resulting in slower speed and longer journey times and increased queuing i.e. demand exceeds capacity.
Equilibrium		Under equilibrium conditions traffic arranges itself in congested networks in such a manner that no individual trip can reduce his trip cost by switching routes.
LRN	Local Road Network	Principal 'A' roads and lower classified roads maintained by the Local Authority i.e. SCC.
Mainline		Main part of the motorway, including lanes and carriageways in both direction and excludes any other parallel roadways, side turns of slip roads.
MSA	Method of Successive Averages	Traffic Assignment using volume averaging that takes a proportion of new flows at each iteration when link travel times are recalculated to define a new shortest route.
MOVA	Microprocessor Optimised Vehicle Actuation	Strategy for the control of traffic light signals at isolated junctions operating under uncongested or congested conditions.
PCU	Passenger Car Units	The number of cars required to represent the congestion effect of a vehicle.
SHLAA	Strategic Housing Land Availability Assessment	In accordance with Planning Policy Statement 3 (Annex C,2006) Local Authorities are now required to carry out a Strategic Housing Land Availability Assessment (SHLAA) to identify future sources of land for housing.
SINTRAM	Surrey Integrated Transport Model	SCC's Strategic County Transport Model.
SRN	Strategic Route Network	Motorways and major 'A' roads maintained by the Highways Agency
VCR	Volume Capacity Ratio	Ratio of traffic flow over the theoretical capacity of a section of highway.
Zone		Represent the geographical land use area or administrative boundaries based on Census Output Area used to define the origins and destinations of travel.
Zone Centroids		Connects the land use system with the transport network

EXECUTIVE SUMMARY

The transport assessment for Reigate & Banstead is a study to consider the cumulative traffic impacts of future development within the borough, to the forecast year of 2026. The study assists with assessing the sensitivity of both the Strategic Route Network (SRN) and Local Road Network (LRN), including classified A and B roads, to the likely additional traffic generated by committed and planned residential and commercial development as proposed in the emerging Core Strategy of the Local Development Framework (LDF) for Reigate & Banstead Borough Council (RBBC).

The purpose of the study was to evaluate the highway impacts of the strategic development within Reigate & Banstead between 2009 and 2026. It also considered the requirements of the Highways Agency (HA) and Surrey County Council (SCC) as highway authorities. The main objectives of the study were to:

- Identify the amounts and locations of additional commercial and residential development in Reigate & Banstead's emerging core strategy;
- Calculate the distribution of vehicle trips resulting from the additional development;
- To forecast the traffic impacts of individual developments on both the LRN and SRN;
- Act as a starting point for identifying the locations that will require further study to manage and promote growth;
- Report the main traffic impacts on both the LRN and SRN.

The main benefits to this approach was to ensure that any strategic infrastructure requirements identified could be used to support the boroughs needs to produce a local Infrastructure Delivery Plan (IDP) using a common and consistent strategic evidence base. This evidence base could also be used to support future funding bids for transport infrastructure or services.

The County Transport model (SINTRAM60_R&B_111017) version 6.0 was used to evaluate the development proposals. SINTRAM is a strategic transport model that encapsulates the road network of Surrey and surrounding local authorities; at a national level the model incorporates all strategic roads within Great Britain. SINTRAM is run in the OmniTRANS version 6.0 transport modelling software.

The SINTRAM model assesses link capacity and therefore indicates which sections of the highway network are likely to experience delays as a result of traffic demand exceeding capacity with a consequent reduction in vehicle speeds. It can also indicate how traffic diverts away from busy routes (i.e. re-distribution effects), where traffic is slowed because of excessive demand, and adds to flows on secondary routes that may be less suitable and hence more sensitive to changes in flow. Thus, making it a reasonable tool for the strategic assessment of Reigate & Banstead's emerging Core Strategy and to identify any potential traffic impacts.

Reigate & Banstead's planning team provided the data grouped according to whether the developments had committed or planned planning permission and it was agreed by SCC and RBBC to test four development scenarios incrementally resulting in a final cumulative scenario, as each scenario includes the previous scenario plus additional planning assumptions:

Therefore each individual scenario input consists of differing development types and planning status. The details of the differing elements of each development scenario are shown below.

Scenario	Description	Development Type	Planning Status
Scenario 1a	All current "commitments" since 2009.	Commercial & Residential	Committed
Scenario 1b (Cautious trajectory)	High-likelihood Strategic Housing Land Availability Assessment (SHLAA) sites High-likelihood employment sites High-likelihood retail sites High-likelihood regeneration sites Critical items from Infrastructure Delivery Plan (IDP)	Commercial & Residential	Planned
Scenario 2 (High trajectory)	Small windfall sites SHLAA broad areas All employment sites All retail sites Regeneration schemes Important items from the IDP	Commercial & Residential	Planned
Scenario 3 (Urban Extension)	Sustainable urban extensions	Residential	Planned

Main Outcomes

Borough roads most sensitive to increases in additional traffic and other associated impacts such as congestion and increased journey times between 2026 Scenario 2 (when compared to 2026 Scenario 1b), are located in close proximity to the development areas identified to support the greatest amount of additional development and hence incur the greatest amount of additional trips. (Redhill – Holmethorpe East- zone 163) is proposed to incur the greatest amount of additional origin trips and as a result roads within this vicinity experience the greatest impacts, specifically the A25 Nutfield Road.   Several road corridors have been identified as particularly sensitive to the additional traffic generated by the future development, these corridors include:

- A217 London Rd (Reigate Town Centre)
- A23 London Rd (N) & (S) (Redhill to Merstham);
- A23 Marketfield Way (South of Redhill Town Centre)
- A23 Brighton Rd (Redhill Town Centre)
- A23 Brighton Rd (Salfords)
- C224 Linkfield Lane
- Horley Row (Meath Green\ Horley)

Within these corridors some 'key' junctions are also sensitive to additional traffic flow and increased junction delay. Some of the junctions forecast to experience the greatest increases in junction delay between 2026 Scenario 1b and 2026 Scenario 2, occur along the A23 corridor between Redhill and Merstham, Redhill town centre, including:

- A23 London Rd, Frenches Rd, Linkfield Ln
- A25 Queens Way, A23 London Road, A23 Princess Way
- Linkfield Ln, Gloucester Rd
- A23 Princess Way, A25 Redstone Hill, A23 Marketfield Way
- A23 Marketfield Way, A23 Brighton Rd, A23 High St
- Linkfield Ln, A25 Station Rd, A25 Hatchlands Rd
- A25 Hatchlands Rd, Fangates Rd

When considering the additional traffic impacts on congestion levels within the borough, there is little evidence to suggest that this increases by a significant amount in the 2026 Development scenario forecast scenarios. However, there are several road corridors which appear to suffer the constant effects of congestion within all of the development scenarios, these being:

- A217 Cockshot Hill/Reigate Hill and A25 West St – Reigate;
- A23 London Rd North/London Rd South – Redhill/Merstham;
- A23 Brighton Rd/B2036 Balcombe Rd – Horley.

Other than Redhill and some areas of Reigate as mentioned above the impacts of the various development scenario trajectories appears to have limited effect in areas to the north of the M25 and for the rest of the Borough.

In relation to the SRN, any traffic impacts caused by the additional traffic generated from the boroughs planned development appear minimal. Since the traffic flows and levels of congestion projected on the M25 junction 8 and associated carriageway only show minor differences when comparing the various 2026 development scenarios.

A simple highway capacity assessment was conducted on the M25 Junction 8 (Reigate Hill) merge and diverges. This assessment made use of the DMRB guidelines of junction layout according to the upstream/downstream and merge/diverge flows. The modelled flows used in the assessment and the results suggest that the merge configurations may need upgrading to accommodate the estimated traffic growth projected to occur between the current situation and the 2026 Do-Minimum. The 2026 Do-Minimum refers to the 2026 'full' traffic growth for the entire country, and background growth for the borough of Reigate & Banstead. However, the assessment also reveals that no further upgrades in merge/diverge configuration would be required to accommodate the estimated traffic growth between the 2026 Do-Minimum and 2026 Development scenario forecasts, assuming that the required upgrade was implemented.

Overall the assessment suggests that some 'improvements' will be required to mitigate against the impacts of background growth and committed development between now and 2026, and that that further improvements will also be required to mitigate the impacts at the specific locations mentioned above if development scenarios 1b or 2 where implemented . Scenario 3 had minimal impacts compared against Scenario 2.

Study Limitations

Given the strategic nature of the model and using data based on local planning estimates from Reigate and Banstead's emerging Core Strategy, there are a number of limitations which need to be considered during the preparation and interpretation of the highway capacity impacts on both the SRN and LRN within this report which are set out below.

The limitations of the planning estimates produced in August 2011 (and the uncertainty of the size, distribution and land-use of any future planned developments) and the interpretation of the likely impacts on both the SRN and LRN within this assessment should be treated as broad strategic projections, and as such further work would be recommended, (including complementary analysis using appropriate modelling or other assessment methods), to further assist in the identification of additional infrastructure needs and other potential mitigation measures at a more local and detailed level.

This transport assessment is 'a tool' for incrementally assessing the cumulative traffic impacts generated from future committed and planned development proposals in the borough of Reigate & Banstead.   The cumulative borough-wide transport assessment also assumes that all development would occur simultaneously and that any impacts described in this report do not account for any possible mitigation, demand management or infrastructure provision and effectively present a worse case situation.

PART A

1   INTRODUCTION

1.1   Overview

1.1.1   The transport assessment for Reigate & Banstead is a study to consider the cumulative traffic impacts of future development within the borough, to the forecast year of 2026. The study assists with assessing the sensitivity of both the (SRN) and (LRN), including classified A and B roads, to the likely additional traffic generated by committed and planned residential and commercial development as proposed in the emerging Core Strategy of the (LDF) for Reigate & Banstead Borough Council.

1.1.2   The LDF process prescribes the use of an evidence based approach to understand the potential impacts from future development plans used in the Core Strategy and in relation to transport it is required that an evaluation of the potential transport and highway impacts is undertaken. This assessment is required to satisfy and inform RBBC and (SCC), the designated highway authority for the LRN, as well as the (HA), responsible for the SRN, on the ability of the highway network to cope with the additional traffic generation / demand and subsequently assist in identifying specific locations that may require future mitigation or infrastructure.

1.1.3   In June 2011 SCC's Transport Studies Team were commissioned by RBBC to undertake a transport assessment to assess the transport implications of the emerging LDF Core Strategy.

1.1.4   It should be noted that SCC's Transport Studies Team previously conducted a transport assessment for RBBC in 2008, based on RBBC's original development allocation and distribution, as well as using an older version of the County's Transport Model (SINTRAM version 3.3). However, RBBC have decided to re-submit their Core Strategy and in conjunction with this have altered the development allocation and distribution, hence the need to re-assess the transport implications of their Core Strategy using the most recent version of the County's Transport Model (SINTRAM version 6.0).

1.1.5   The key differences between the County's Transport Model, SINTRAM, version 3.3 and version 6.0 are as follows:

- An updated base year (2009)
- Variable demand model used to generate the modelled base year, 2009;
- A greater number of time periods modelled;
- Trip matrices composed by multiple journey purposes;
- TEMPRO version 5.4 used to generate forecast trip ends.

1.2   Objectives

1.2.1   The purpose of the study was to evaluate the highway impacts of the strategic development within Reigate & Banstead between 2009 and 2026. It also considered the requirements of the HA and SCC as highway authorities.

1.2.2   SINTRAM, version 6.0, was the tool used to evaluate the highway impacts of the committed and planned developments on both the SRN and LRN. A detailed description of the technical traffic modelling and methodology is contained in *Part B* of this report.

1.2.3   The main objectives of the study were to:

- Identify the amounts and locations of additional commercial and residential development in Reigate & Banstead's emerging core strategy;
- Calculate the distribution of vehicle trips resulting from the additional development;
- To forecast the traffic impacts of individual developments on both the LRN and SRN;
- Act as a starting point for identifying the locations that will require further study to manage and promote growth;
- Report the main traffic impacts on both the LRN and SRN.

1.2.4   The main benefits to this approach was to ensure that any strategic infrastructure requirements identified could be used to support the boroughs needs to produce a local Infrastructure Delivery Plan (IDP) using a common and consistent strategic evidence base. This evidence base could also be used to support future funding bids for transport infrastructure or services.

1.3   Scope

1.3.1   SINTRAM models the average AM peak hour (0700 – 1000), and the study will only assess this time period. The model base year is 2009 and the forecast year is 2026. The model does not include public transport hence only evaluates the impacts on highway capacity.

1.3.2   For comparison purposes a Do-Minimum scenario was developed as a reference. The methodology detailing this is described in *Part B* (*para 7.1.3*). Two networks were used in the modelling process: a 2009 network and a 2026 network. The 2009 base network replicates the road networks capacity as it was in 2009. Whereas the 2026 future network is the same as the 2009 but includes the HA's Hindhead Improvement Scheme in the borough of Waverley, which was completed in the summer of 2011, as well as the widening (from dual 3 lanes to dual 4 lanes) of the M25 junctions 16 – 23 and junctions 27 – 30.

1.4   Report Structure

1.4.1   This report has been divided into two parts: Part A and Part B. Part A gives an overview of the overall study and concentrates on the analysis of the impacts in the transport assessment. Part B provides further detailed technical information on the methodology and modelling aspects of the study.

Part A – Section 2: An overview of the methodology and modelling undertaken;

Part A – Section 3: The modelling results and analysis of impacts on both the SRN and LRN;

Part A – Section 4: Main conclusions and summary of the evaluation;

Part B – Section 5: A description of the model development and validation results;

Part B – Section 6: Describes the estimation of trip rates for the proposed development and modelled scenarios;

Part B – Section 7: The development and results of the 2026 trip forecasts.

2   OVERVIEW OF MODELLING & METHODOLOGY

2.1   Suitability for Purpose

2.1.1   The County Transport model (SINTRAM60_R&B_111017) version 6.0 was used to evaluate the development proposals.   SINTRAM is a strategic transport model that encapsulates the road network of Surrey and surrounding local authorities; at a national level the model incorporates all strategic roads within Great Britain. SINTRAM is run in the OmniTRANS version 6.0 modelling software.

2.1.2   All motorways, A and B roads together with some local roads are explicitly modelled within SINTRAM. Where traffic junctions and traffic signals are likely to have significant effects, the details of their general layout or timing of the signals are also included in the modelling. However, strategic modelling uses aggregate descriptions of traffic such as flow, density and speed, and the relationships between them and hence does not include every road or junction. As a result the model is unable to answer detailed questions regarding traffic interactions, such as queuing and individual driver behaviour. It can however, provide approximate answers to transport problems (i.e. redistribution effects), making it a reasonable tool for assessing potential impacts on both strategic and local roads.

2.1.3   The SINTRAM model assesses link capacity and therefore indicates which sections of the highway network are likely to experience delays as a result of traffic demand exceeding capacity with a consequent reduction in vehicle speeds. It can also indicate how traffic diverts away from busy routes (i.e. re-distribution effects), where traffic is slowed because of excessive demand, and adds to flows on secondary routes that may be less suitable and hence more sensitive to changes in flow. Thus, making it a reasonable tool for the strategic assessment of Reigate & Banstead's emerging Core Strategy and identify any potential traffic impacts.

2.2   Study Area

2.2.1   The study area of this study is defined by the borough boundaries of Reigate & Banstead. All results presented in this report represent traffic impacts incurred in the borough of Reigate and Banstead only. Figure 2.1 shows the borough boundaries.
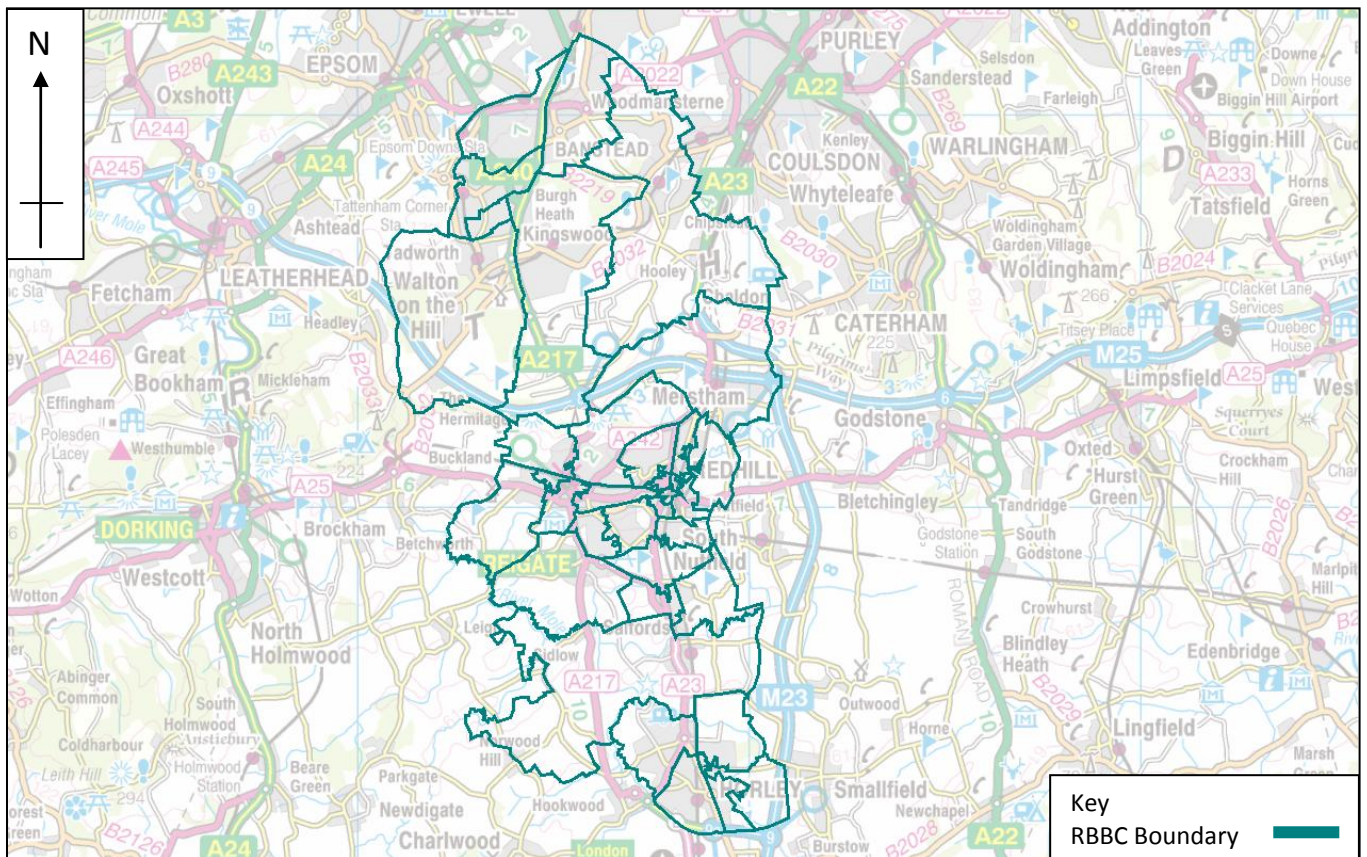
Figure 2.1: Extent of study area

2.3   Study Approach

2.3.1   The use of a strategic model allows an assessment of the potential wider impacts of the development locations on the transport network. It is envisaged that further work would be required to undertake more detailed analysis of impacts on key junctions as required by the HA and SCC. Furthermore at this stage the study does not take into account any other transport mitigation measures.

2.3.2   The objective, at this stage of the LDF process, is to assess the broad development locations in terms of the likely impact on travel demand, highway capacity and transport infrastructure.

2.4   Estimated Future Development Data

2.4.1   Data concerning the permissions and allocations of commercial and residential developments from 2009 to 2026 in the borough was presented to SCC's Transport Studies Team. The data was received in the form of the Transport Studies Teams completed pro-forma.

2.4.2   Reigate & Banstead planning team provided the data grouped according to whether the developments had committed or planned planning permission. Status of planning permission affects the implications of developments because it is not possible to influence the developments that have received planning permission.

2.4.3   It was agreed by SCC and RBBC to test four forecast scenarios that are incrementally built to result in a cumulative scenario, as each scenario includes the previous scenario plus additional inputs:

- Scenario 1a = Scenario 1a only
- Scenario 1b = Scenario 1a + Scenario 1b
- Scenario 2 = Scenario 1a + Scenario 1b + Scenario 2
- Scenario 3 = Scenario 1a + Scenario 1b + Scenario 2 + Scenario 3

2.4.4   Therefore each individual scenario input consists of differing development types and planning status. Table 2.1 details the differing elements of each scenario input.

2.4.5   For more detailed explanations of the methodology adopted by Reigate & Banstead to provide the commercial and residential planning data for this study please refer to Reigate & Banstead's document "*Transport Impact Modelling: RBBC transport modelling development scenarios for the RBBC Infrastructure Delivery Plan (IDP),*" August 2011.

Scenario	Description	Development Type	Planning Status
Scenario 1a	All current "commitments" since 2009.	Commercial & Residential	Committed
Scenario 1b (Cautious trajectory)	High-likelihood Strategic Housing Land Availability Assessment (SHLAA) sites High-likelihood employment sites High-likelihood retail sites High-likelihood regeneration sites Critical items from Infrastructure Delivery Plan (IDP)	Commercial & Residential	Planned
Scenario 2 (High trajectory)	Small windfall sites SHLAA broad areas All employment sites All retail sites Regeneration schemes Important items from the IDP	Commercial & Residential	Planned
Scenario 3 (Urban Extension)	Sustainable urban extensions (limited release of Green Belt land)	Residential	Planned

Table 2.1: Elements for scenario testing

2.4.6   Trip rate estimates were generated for both existing and proposed developments using the **T**rip **R**ate **I**nformation **C**omputer Database (TRICS) for both residential (number of households) and commercial developments (floor space by gross floor area). The additional trips from the proposed developments were calculated by deducting the existing development trips from the proposed development trips, these estimates of additional trips were then applied to the relevant modelled zone.

2.4.7   Further details about the development data and forecasting methodology are described in Part B Sections 6 and 7.

3   MODELLING RESULTS AND ANALYSES

3.1   General

3.1.1   This section provides both graphical and tabulated evidence of the highway impacts resulting from the estimated development between 2009 and 2026. The evidence demonstrates the highway impacts in terms of additional flow on links, and the subsequent effects on the highway capacity on both the SRN and LRN to cope with that additional flow.

3.1.2   The results are based on the study area defined in Figure 2.1. When appropriate the results have been disaggregated to highlight the impacts on both the SRN and LRN.

3.1.3   It is important to note that all the summary statistics and other tabulated results within the report represent traffic impacts projected to occur as a result of the impacts caused by the estimated developments between 2009 and 2026 in the borough of Reigate & Banstead only.

3.1.4   The results presented in this section include the following modelled scenarios:
- 2009 Base
- 2026 Do-Minimum
- 2026 Scenario 1a
- 2026 Scenario 1b
- 2026 Scenario 2
- 2026 Scenario 3

3.1.5   Where appropriate some additional analysis has been provided to highlight the impacts between Scenarios 1b and 2. Which are considered more likely to be adopted as Scenario 3 requires urban extensions.

3.1.6   The results include network statistics, difference in flow plots, bandwidth plots of flow and highway capacity and detailed analysis of trips using the SRN slip roads and mainline associated with the borough.

3.2   Summary Network Statistics

3.2.1   Tables 3.1 and 3.2 present the network based summary statistics for all modelled links and vehicles within the study area, as shown in Figure 2.1. The summary statistics compare key outputs from each modelled scenario, the 2009 base, the 2026 Do-Minimum and the 2026 Development scenario forecasts (Scenarios 1a, 1b, 2 and 3). The network statistics are disaggregated into road types ('Minor Roads' refers to C, D and unclassified roads).

3.2.2   Table 3.1 shows the amount and proportional breakdown of modelled links within the Reigate & Banstead borough boundaries.

Road Type	No. of Links	Link Kms	% Link Kms
Motorways	43	50	11%
Trunk Roads	12	5	1%
Principal Roads	245	115	26%
B Roads	130	84	19%
Minor Roads	245	189	43%
Total	**675**	**443**	**100%**

Table 3.1: Reigate and Banstead modelled link network proportions

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kilometres (veh kms)	Motorway	174787	194834	189538	190518	191897	192118	20047	-5296	980	1379	221	11.5%	-2.7%	0.5%	0.7%	0.1%
	Trunk Rd	5365	5801	5579	5714	5909	5846	436	-222	135	195	-63	8.1%	-3.8%	2.4%	3.4%	-1.1%
	Principal Rd	91930	101613	102050	107666	110067	110966	9683	437	5616	2401	899	10.5%	0.4%	5.5%	2.2%	0.8%
	B Rd	38521	42478	44109	44864	45974	46348	3957	1631	755	1110	374	10.3%	3.8%	1.7%	2.5%	0.8%
	Other Rd	44285	49055	52080	57591	60158	61190	4770	3025	5511	2567	1032	10.8%	6.2%	10.6%	4.5%	1.7%
	Total	**354888**	**393781**	**393356**	**406353**	**414005**	**416468**	**38893**	**-425**	**12997**	**7652**	**2463**	**11.0%**	**-0.1%**	**3.3%**	**1.9%**	**0.6%**
Vehicle Hours (veh hrs)	Motorway	1884	2225	2137	2161	2187	2192	341	-88	24	26	5	18.1%	-4.0%	1.1%	1.2%	0.2%
	Trunk Rd	86	101	96	100	107	104	15	-5	4	7	-3	17.4%	-5.0%	4.2%	7.0%	-2.8%
	Principal Rd	2179	2527	2582	2810	2907	2948	348	55	228	97	41	16.0%	2.2%	8.8%	3.5%	1.4%
	B Rd	973	1112	1160	1185	1226	1240	139	48	25	41	14	14.3%	4.3%	2.2%	3.5%	1.1%
	Other Rd	985	1110	1179	1323	1391	1423	125	69	144	68	32	12.7%	6.2%	12.2%	5.1%	2.3%
	Total	**6107**	**7075**	**7154**	**7579**	**7818**	**7907**	**968**	**79**	**425**	**239**	**89**	**15.9%**	**1.1%**	**5.9%**	**3.2%**	**1.1%**
Average Speed (kph)	Motorway	92.8	87.6	88.7	88.2	87.7	87.6	-5.2	1.1	-0.5	-0.5	-0.1	-5.6%	1.3%	-0.6%	-0.6%	-0.1%
	Trunk Rd	62.0	57.5	58.0	57.1	55.2	56.0	-4.5	0.5	-0.9	-1.9	0.8	-7.3%	0.9%	-1.6%	-3.3%	1.4%
	Principal Rd	42.2	40.2	39.5	38.3	37.9	37.6	-2.0	-0.7	-1.2	-0.4	-0.3	-4.7%	-1.7%	-3.0%	-1.0%	-0.8%
	B Rd	39.6	38.2	38.0	37.8	37.5	37.4	-1.4	-0.2	-0.2	-0.3	-0.1	-3.5%	-0.5%	-0.5%	-0.8%	-0.3%
	Other Rd	45.0	44.2	44.2	43.5	43.3	43.0	-0.8	0.0	-0.7	-0.2	-0.3	-1.8%	0.0%	-1.6%	-0.5%	-0.7%
	Average	**56.3**	**53.5**	**53.7**	**53.0**	**52.3**	**52.3**	**-2.8**	**0.1**	**-0.7**	**-0.7**	**0.0**	**-4.9%**	**0.3%**	**-1.3%**	**-1.2%**	**0.0%**

Table 3.2: Reigate & Banstead borough network summary statistics

3.2.3   Table 3.2 displays network summary statistics for the borough. The results of each scenario can be compared sequentially against the previous scenario which acts as a reference case. For instance the 2009 base acts as a reference for the 2026 Do-Minimum and the 2026 Do-Minimum acts as a reference for 2026 Scenario 1a etc.

3.2.4   The 2026 Do-Minimum contains 'full development' (all forecast development including background growth) to the forecast year of 2026 in all modelled zones external to the study area (i.e. everywhere in the model apart from Reigate & Banstead), but only 2009 'full development' and 2009 to 2026 'background growth' (changes in demographics and car ownership) in the modelled zones of Reigate and Banstead (see *Section 7.1* for more detail). Therefore changes in summary statistics for the 2026 Do-Minimum are the impacts felt in the borough as a result of the rest of the countries development to 2026 and inclusion of background growth in the borough.

3.2.5   The total statistics (sum of all road types) suggest that all variants are expected to experience an increase in vehicle kilometres and vehicle hours when comparing individual scenarios to their respective reference cases. A decrease in average speed is a direct result of increased vehicle kilometres, which is also expected to occur in all modelled variants. In summary vehicle kilometres travelled in the borough is projected to increase from 354,888 veh kms in the 2009 base to 416,468 veh kms in 2026 Scenario 3, a 17% increase. Vehicle hours is estimated to increase by 29% between the 2009 base (6,107 veh hrs) and 2026 Scenario 3 (7,907 veh hrs). The average speed of all vehicles travelling on the highway network, in Reigate & Banstead, is estimated to reduce by 4 kph (7% reduction) between the 2009 base (56.3 kph) and 2026 Scenario 3 (52.3 kph).

3.2.6   The exception to these increases is in the Motorway and Trunk Road categories, when comparing between 2026 Scenario 1a and the 2026 Do-Minimum, these road types experience a minimal decrease in vehicle kilometres and vehicle hours, thus resulting in the projection of a minor increase in average speeds for these road types. For example motorways experience a 2.7% reduction in vehicle kilometres, a 4% reduction in vehicle hours and a 1.3% increase in average speed, between 2026 Scenario 1a and the 2026 Do-Minimum.

3.2.7   In summary the entire borough is expected to incur minor changes in total vehicle kilometres, vehicle hours (minor increases) and average speed (minor decreases) in the 2026 Development scenario forecasts. The greatest differences between individual scenarios is between 2026 Scenario 1a and 2026 Scenario 1b, as vehicle kilometres are expected to increase by 12,997 veh kms (3.3%), vehicle hours by 425 veh hrs (5.9%) and average speed is expected to decrease by 0.7 kph (1.3%)

3.2.8   In 2026 Scenario 2 and 2026 Scenario 3 the road types to incur the greatest absolute increase in vehicle kilometres are the Principal Roads and Other Roads, as in 2026 Scenario 2 (compared to 2026 Scenario 1b) the vehicle kilometres travelled on these roads increases by .2,401 veh kms (2.2%) and 2,567 veh kms (4.5%). Whereas in 2026 Scenario 3 (compared to the 2026 Scenario 2) the vehicle kilometres travelled on Principal Roads increases by 899 veh kms (0.8%) and 1,032 veh kms (1.7%) on Other Roads. These road types are likely to incur the greatest amount of additional vehicle kilometres travelled in the borough as they contribute the greatest proportions to the road composition in the borough, as Table 3.1 suggests. 26% of the modelled link kms in Reigate & Banstead are classified as Principal Roads whilst 43% are classified as Other Roads.

3.2.9   The projected traffic impacts between development Scenarios 2 and 3 are considered to be minimal. For example total vehicle kilometres are estimated to increase by 0.6% (2,463 veh kms) and total vehicle hours are estimated to increase by 1.1% (89 veh hrs) whereas the total average speed is projected to remain constant.

3.3   Additional Traffic

3.3.1   Changes in the modelled flows can be shown using a bandwidth plot with comparisons made to the scenarios relevant reference cases. Figures 3.1 to 3.5 show the absolute differences in traffic flow, for all modelled vehicles, between the various development scenarios and their relevant reference case. This makes it possible to visualise the likely increases/decreases in traffic flows on individual roads.

3.3.2   Where bandwidths are coloured blue it indicates an increase in flow whereas links coloured red indicates a decrease in flow between the two scenarios being compared. The widths of the bands are proportional to the increase/decrease in flow on individual links.

3.3.3   Figure 3.1 shows that the greatest increases in traffic flow between the 2009 base and 2026 Scenario 1a, which illustrates the cumulative impacts of background growth and committed development. As expected the greatest increases occur on the SRN, namely the M25 between Junctions 7 and 9, in both directions but mainly in the anti-clockwise direction, and the M23 northbound and southbound. In terms of the LRN the greatest increases in traffic flow in the borough are expected to occur along the A217 to north of the M25, and the A23 around Horley and Gatwick. The B2032 Pebble Hill also exhibits additional traffic flow, just outside the study area.
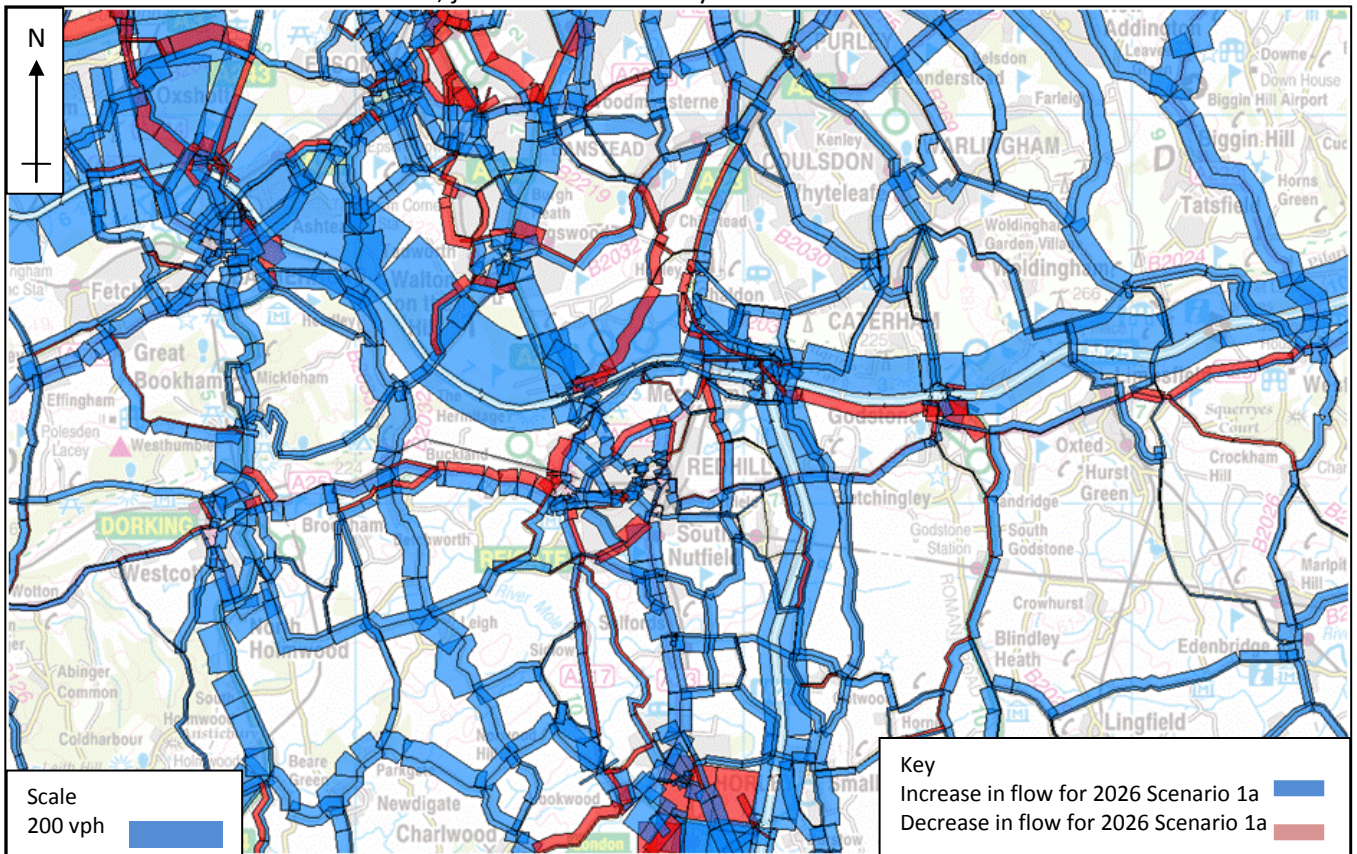
Figure 3.1: 2026 Scenario 1a flows less 2009 Base flows

3.3.4   Table 3.3 displays the roads most sensitive to additional flow projected to occur between the 2009 base and 2026 Scenario 1a.   This table shows the same information as Figure 3.1 but in a numeric form. The flows represent the total traffic flow for all modelled vehicles. The ranking shows the sensitivity of the road to additional flow in relation to either the SRN or LRN and overall across the borough for all 675 modelled links within the Borough.

3.3.5   So for example the first row of Table 3.3 shows that the mainline through M25 Junction 8 (Reigate Hill) is predicted to experience the greatest increase in traffic flow of 983 passenger car units and is ranked 1st (highest) in terms of the modelled links categorised as part of the SRN and hence ranked 1st (highest) in terms of all 675 modelled links including the LRN. Similarly when assessing the LRN Table 3.3 shows that the A23 Airport Way is predicted to experience the greatest increase in traffic flow of 578 passenger car units and is ranked 1st (highest) in terms of the modelled links categorised as part of the LRN and hence ranked 7th in terms of all 675 modelled links including both the SRN and LRN.

3.3.6   It should be noted that the overall ranking is not sequential as some roads have multiple model links (e.g. the motorway between junctions is effectively one section of road, but in modelling terms in order to represent road alignment this may be broken down into two or more modelled links with identical attributes and flows) these have been excluded from the table to aid clarity. Those entries in the table with a * indicates that those links mainly lie outside the study area but some section of the road falls within the borough of Reigate & Banstead.

Link No.	Road Nos.	Road Name	Capacity (pcu/hr)	2009 Flow (pcu/hr)	2026 Scenario 1a Flow (pcu/hr)	Absolute Diff in Flow (pcu/hr)	% Diff in Flow	Rank	Overall Rank
				SRN					
11973	M25	J8	7600	4,477	5,460	983	22.0%	1	1
10658	M25	J9-8	7600	5,330	6,310	980	18.4%	2	3
8859	M25	J8-7	7600	5,746	6,613	867	15.1%	3	4
4253	M23*	J9a-9	3800	2,141	2,719	578	27.0%	4	7
11963	M25	J7 Slip Off to M23 N	3800	2,723	3,178	454	16.7%	5	10
11962	M25*	J7-6	5700	3,022	3,435	413	13.7%	6	12
9931	M23	J9-8	5700	4,908	5,312	404	8.2%	7	14
11965	M25	J7 Slip Off to M23 S	3800	2,673	3,073	400	15.0%	8	17
11939	M25	J8-9	7600	6,479	6,852	373	5.8%	9	22
11059	M25	J8 Slip Off to A217	5100	2,538	2,880	342	13.5%	10	25
11957	M23	J8 Slip Off to M25 E	3800	4,327	4,648	321	7.4%	11	29
17840	M25	J8 Slip On CW	1900	1,079	1,384	304	28.2%	12	37
11982	M23	J8-9	5700	5,132	5,414	282	5.5%	13	43
11958	M23	J8 Slip Off to M25 E	3800	2,219	2,442	224	10.1%	14	71
12305	M25	J8 Slip Off to A217	3400	2,609	2,813	204	7.8%	15	91
12307	M25	J8 Slip Off to A217	5100	1,187	1,348	160	13.5%	16	148
11960	M23	J8 Slip Off to M25 E	3800	2,281	2,403	122	5.4%	17	220
11940	M25	J7-8	7600	6,821	6,934	112	1.6%	18	239
11959	M23	J8 Slip Off to M25 E	3800	2,109	2,206	97	4.6%	19	268
11806	M23	J8-7	3800	1,104	1,187	83	7.5%	20	301
				LRN					
2522	A23	Airport Way	3500	2,141	2,719	578	27.0%	1	7
16258	A217*	Belmont Rise	800	882	1,320	438	49.6%	2	11
17617	A2022	Fir Tree Road	800	271	682	410	151.2%	3	13
8253	A217	Brighton Road	3400	1,508	1,909	401	26.6%	4	16
8247	A217	Brighton Road	5100	2,201	2,579	378	17.2%	5	18
17563	A217	Reigate Hill Road	3400	1,158	1,534	376	32.5%	6	19
17560	C	Gatton Bottom	1200	418	791	373	89.4%	7	21
17608	A217	Brighton Road	3400	1,962	2,327	365	18.6%	8	23
8255	A217	Brighton Road	3400	1,634	1,997	363	22.2%	9	24
8930	A23	Horley Road	1700	595	926	331	55.7%	10	26
8929	A23	Horley Road	1700	629	955	326	51.8%	11	27
11834	A23	Horley Road	1700	725	1,049	324	44.6%	12	28
8866	A217*	Reigate Road	1200	498	818	319	64.1%	13	30
17592	A23	London Road North	800	702	1,017	315	44.9%	14	31
8240	A217	Brighton Road	3400	1,349	1,660	311	23.1%	15	32
8840	A23	Brighton Road	1700	1,037	1,344	308	29.7%	16	36
12137	A217	Brighton Road	3400	2,488	2,780	291	11.7%	17	38
17611	B2032*	Pebble Hill	1200	773	1,059	286	37.1%	18	39
12135	A25	High Street	1600	1,399	1,683	284	20.3%	19	41
17630	C	Horse Hill	1200	264	542	278	105.2%	20	46

Table 3.3: Roads most sensitive to additional traffic between 2026 Scenario 1a and 2009 Base

3.3.7   The mainline through M25 Junction 8 (Reigate Hill) experiences the greatest increase in additional traffic of 983 passenger car units from 4,477 to 5,460 which equates to an increase of 22%. The greatest additional flow on the M23 occurs between Junction 9A (Airport Way) and Junction 9 (Gatwick) with 578 additional passenger car units from 2,141 to 2,719 which equates to a 27% increase.

3.3.8   For the LRN the A23 Airport Way which lead to the M23 Junction 9A (Airport Way) experiences the greatest increase in additional traffic of 578 passenger car units from 2,141 to 2,719 which equates to 27%. The A217 corridor between the M25 Junction 8 and Burgh Heath is likely to see an increase of around 300-400 passenger car units around 20% additional traffic. A similar impact occurs along the A23 Horley Rd near Earlswood, with traffic flows increasing by over 300 passenger car units.

3.3.9   Figure 3.2 shows that the greatest increases in additional traffic flow between the 2026 Scenario 1a and 2026 Scenario 1b, which illustrates the impacts of the 'cautious development trajectory' in addition to those derived between the base and 2026 Scenario 1a.

Figure 3.2: 2026 Scenario 1b flows less 2026 Scenario 1a flows

3.3.10   Table 3.4 displays the roads most sensitive to additional flow projected to occur between the 2026 Scenario 1a and 2026 Scenario 1b. This table shows the same information as *Figure 3.2* but in a numeric form. The flows represent the total traffic flow for all modelled vehicles. The ranking shows the sensitivity of the road to additional flow as a result of the 'cautious development trajectory' in relation to either the SRN or LRN and overall across the borough for all 675 modelled links.

Link No.	Road Nos.	Road Name	Capacity (pcu/hr)	2026 Scenario 1a Flow (pcu/hr)	2026 Scenario 1b Flow (pcu/hr)	Absolute Diff in Flow (pcu/hr)	% Diff in Flow	Rank	Overall Rank
				SRN					
4253	M23*	J9a-9	3800	943	1,077	134	14.2%	1	37
11973	M25	J8	7600	5,460	5,580	120	2.2%	2	50
17577	M25	J8	7600	5,468	5,565	97	1.8%	3	84
11957	M23	J8 Slip Off to M25 E	3800	4,648	4,743	95	2.0%	4	95
11940	M25	J7-8	7600	6,934	7,023	90	1.3%	5	108
12308	M25	J8 Slip Off to A217	5100	1,496	1,583	86	5.8%	6	113
11982	M23	J8-9	5700	5,414	5,497	83	1.5%	7	120
11959	M23	J8 Slip Off to M25 E	3800	2,206	2,274	69	3.1%	8	159
11960	M23	J8 Slip Off to M25 E	3800	2,403	2,466	63	2.6%	9	170
4253	M23*	J9a-9	3800	2,719	2,768	49	1.8%	10	205
11965	M25	J7 Slip Off to M23 S	3800	3,073	3,121	48	1.6%	11	211
12307	M25	J8 Slip Off to A217	5100	1,348	1,391	43	3.2%	12	227
12305	M25	J8 Slip Off to A217	3400	2,813	2,848	35	1.3%	13	265
11963	M25	J7 Slip Off to M23 N	3800	3,178	3,212	34	1.1%	14	273
9931	M23	J9-8	5700	5,312	5,340	28	0.5%	15	313
11950	M25	J 7-8	5700	4,530	4,557	27	0.6%	16	325
8859	M25	J8-7	7600	6,613	6,639	27	0.4%	17	327
11958	M23	J8 Slip Off to M25 E	3800	2,442	2,468	26	1.1%	18	336
11939	M25	J8-9	7600	6,852	6,876	24	0.4%	19	349
11059	M25	J8 Slip Off to A217	5100	2,880	2,893	14	0.5%	20	426
				LRN					
8936	A23	Princess Way	1600	721	1,278	557	77.2%	1	1
8936	A23	Princess Way	1600	603	944	341	56.6%	2	2
9222	A23	Princess Way	1600	739	1,051	312	42.2%	3	3
9222	A23	Princess Way	1600	654	936	282	43.0%	4	4
17549	C224	Linkfield Lane	800	429	702	273	63.7%	5	5
15685	C	Horley Row	800	727	978	251	34.5%	6	6
9215	A23	Marketfield	800	593	808	215	36.2%	7	7
17545	Unc	Gloucester Rd	800	250	463	213	84.9%	8	8
8937	A23	London Road South	800	578	781	203	35.2%	9	9
17538	A25	Hatchlands Road	800	365	543	178	48.7%	10	10
8938	A23	London Road South	800	520	697	177	34.1%	11	11
17539	A25	Hatchlands Road	800	494	667	173	35.0%	12	12
17518	C	Mill Lane	800	566	738	172	30.5%	13	13
8935	A23	London Road	800	607	778	171	28.1%	14	14
17549	C224	Linkfield Lane	800	561	730	169	30.2%	15	15
17576	A25	Redstone Hill	1600	719	885	167	23.2%	16	16
17538	A25	Hatchlands Road	800	480	645	165	34.5%	17	17
8924	A25	Redstone Hill	800	640	804	165	25.7%	18	18
8935	A23	London Road	800	714	878	164	22.9%	19	19
8937	A23	London Road South	800	206	365	159	77.4%	20	20

Table 3.4: Roads most sensitive to additional traffic between 2026 Scenario 1b and 2026 Scenario 1a

3.3.11   Figure 3.2 indicates that the 'cautious development trajectory' has minimal impact on the SRN which is confirmed by the low 'overall ranking position' shown in Table 3.4, as all but four links are ranked outside the top 100 or 15%. Within the borough the mainline through M25 Junction 8 (Reigate Hill) towards Junction 7 (Merstham) is projected to have the greatest increase of flow by 120 passenger car units or 2%, but is still only ranked 50th in terms of additional traffic flow. In general, traffic flows for the rest of the SRN increase by less than 50 passenger car units.

3.3.12   Figure 3.2 also indicates that the 'cautious development trajectory' has the greatest impact on the LRN which is confirmed by the 'overall ranking position' shown in Table 3.4, as all 'top 20' most sensitive roads to additional traffic flow occur on the LRN. The greatest increase in additional traffic occurs in Redhill town centre, principally the A23 Princess Way, in both directions, which is predicted to increase from 721 to 1278 an increase of 557 or 77%, but more generally increases by between 280-350 passenger car units or by over 40%. Linkfield Lane an alternative route avoiding the town centre is also expected to experience a significant increase in traffic flow, although this could be attributed to all the development attributed to zone connecter 105 (Redhill – Marketfield Way).

3.3.13   The A25 Hatchlands Road and A25 Redstone Hill heading into Redhill town centre are also projected to incur significant increases in traffic between Scenario 1a and Scenario 1b. Both the A25 Hatchlands Road (eastbound and westbound) and the A25 Redstone Hill (southbound, leading into Redhill) are estimated to have an increased traffic flow of between 170-200 passenger car units between Scenarios 1a and 1b. To a lesser extent, the A23 London Road which is located north and south of Redhill town centre is likely to have an increase in traffic flow of approximately 150 passenger car units. Elsewhere in the borough, roads in Meath Green near Horley experience some increases in traffic whereas areas to north of the M25 such as Banstead and Burgh Heath are least affected by the 'cautious development trajectory'.

3.3.14   Figure 3.3 displays the roads most sensitive to additional traffic flow projected to occur between the 2026 Scenario 1a and 2026 Scenario 2 and illustrates the impacts of the 'high development trajectory' in addition to those derived between the base and 2026 Scenario 1a.

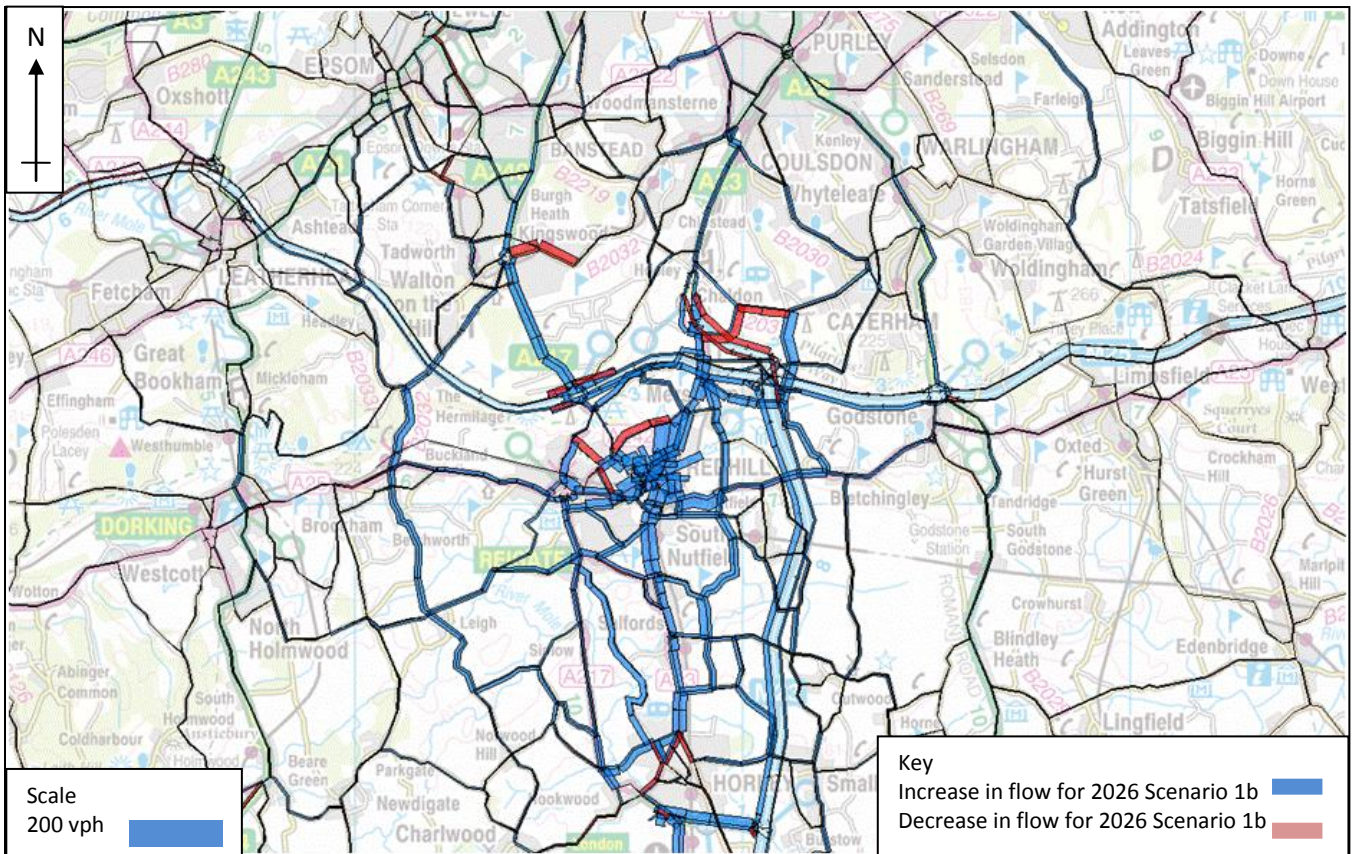**Figure 3.3: 2026 Scenario 2 flows less 2026 Scenario 1a flows**

3.3.15 Table 3.5 displays the roads most sensitive to additional flow projected to occur between the 2026 Scenario 1a and 2026 Scenario 2. The ranking shows the sensitivity of the road to additional flow as a result of the 'high development trajectory' in relation to either the SRN or LRN and overall across the borough for all 675 modelled links.

Link No.	Road Nos.	Road Name	Capacity (pcu/hr)	2026 Scenario 1a Flow (pcu/hr)	2026 Scenario 2 Flow (pcu/hr)	Absolute Diff in Flow (pcu/hr)	% Diff in Flow	Rank	Overall Rank
				SRN					
17577	M25	J8	7600	5,468	5,667	199	3.6%	1	28
4253	M23*	J9a-9	3800	943	1,142	199	21.1%	2	30
11940	M25	J7-8	7600	6,934	7,102	169	2.4%	3	46
12308	M25	J8 Slip Off to A217	5100	1,496	1,650	154	10.3%	4	64
11973	M25	J8	7600	5,460	5,611	151	2.8%	5	67
11982	M23	J8-9	5700	5,414	5,556	142	2.6%	6	75
11957	M23	J8 Slip Off to M25 E	3800	4,648	4,790	142	3.0%	7	78
11959	M23	J8 Slip Off to M25 E	3800	2,206	2,330	124	5.6%	8	106
11960	M23	J8 Slip Off to M25 E	3800	2,403	2,520	117	4.9%	9	125
11965	M25	J7 Slip Off to M23 S	3800	3,073	3,169	96	3.1%	10	164
8859	M25	J8-7	7600	6,613	6,701	89	1.3%	11	177
4253	M23*	J9a-9	3800	2,719	2,805	85	3.1%	12	192
11963	M25	J7 Slip Off to M23 N	3800	3,178	3,263	85	2.7%	13	195
9931	M23	J9-8	5700	5,312	5,383	71	1.3%	14	230
12307	M25	J8 Slip Off to A217	5100	1,348	1,414	67	5.0%	15	238
11950	M25	J 7-8	5700	4,530	4,582	52	1.1%	16	285
11939	M25	J8-9	7600	6,852	6,889	37	0.5%	17	353
12306	M25	J8 Slip Off to A217	5100	2,346	2,383	37	1.6%	18	356
12305	M25	J8 Slip Off to A217	3400	2,813	2,849	36	1.3%	19	362
10658	M25	J9-8	7600	6,310	6,344	35	0.5%	20	371
				LRN					
8936	A23	Princess Way	1600	721	1,349	628	87.2%	1	1
9222	A23	Princess Way	1600	739	1,137	398	53.9%	2	2
8936	A23	Princess Way	1600	603	970	367	60.9%	3	3
17549	C224	Linkfield Lane	800	429	759	331	77.2%	4	4
9222	A23	Princess Way	1600	654	982	328	50.2%	5	5
17589	A25	Nutfield Road	800	360	681	321	89.1%	6	6
9215	A23	Marketfield	800	593	867	274	46.2%	7	7
9402	A25	Castlefield Street	1600	1,168	1,433	265	22.7%	8	8
15685	C	Horley Row	800	727	990	263	36.1%	9	9
8937	A23	London Road South	800	578	828	250	43.3%	10	10
17528	A25	Station Rd	800	379	615	235	61.9%	11	11
17545	Unc	Gloucester Rd	800	250	478	227	90.8%	12	12
17525	A23	Brighton Road	800	965	1,191	225	23.3%	13	13
17576	A25	Redstone Hill	1600	719	938	219	30.5%	14	14
8938	A23	London Road South	800	520	738	218	41.9%	15	15
17588	A25	Nutfield Road	800	311	528	217	69.5%	16	16
17538	A25	Hatchlands Road	800	480	696	216	45.1%	17	17
8935	A23	London Road	800	714	923	209	29.3%	18	18
16111	A23	London Road North	3500	549	758	209	38.1%	19	19
17509	A23*	Airport Way	3400	309	518	209	67.5%	20	22

Table 3.5: Roads most sensitive to additional traffic between 2026 Scenario 2 flows less 2026 Scenario 1a

3.3.16 Figure 3.3 indicates that the 'high development trajectory' has minor impacts on the SRN, which is confirmed by the low 'overall ranking position' shown in Table 3.5, as only three links are ranked inside the top 50. The mainline through M25 Junction 8 (Reigate Hill) towards Junction 7 (Merstham) and M23 Junction 9 (Gatwick) towrads Junction 9A (Airport Way) has the greatest increase of flow of 199 passenger car units or <4%, traffic flows on the rest of the SRN generally increase by less than 100 passenger car units.

3.3.17 Figure 3.3 also indicates that the 'high development trajectory' has the greatest impacts on the LRN, which is confirmed by the 'overall ranking positions' shown in Table 3.5. and follows a similar pattern to that of 'cautious development trajectory' as the A23 Princess Way in Redhill still incurs the greatest increase in additional traffic, and predicted to increase from 721 to 1,349 an increase of 628 or 87%, but is only 70 additional passenger car units than Scenario 1b. The rest of the A23 near the town centre generally increases by over 300 pcu/h or >50%. Again as in the 'cautious development trajectory' Linkfield Lane is predicted to experience a significant increase in traffic flow, associated with the additional development from zone connector 105 (Redhill – Marketfield Way).

3.3.18 There is also an increase in flow in a northbound direction from Cormongers Lane (east of Redhill) adjoining the A25 Nutfield Road/Redstone Hill leading into Redhill town centre. A reason for the A25 Nutfield Road for incurring an increase in traffic is due to its close proximity to the zone connector 163 (Redhill – Holmethorpe East) which produces the greatest amount of additional origin trips due to development in this scenario.

3.3.19 Elsewhere in the borough, roads in Meath Green near Horley experience some increases in traffic whereas areas to north of the M25 such as Banstead and Burgh Heath are least affected by the 'high development trajectory'.

3.3.20 Figure 3.4 displays the roads most sensitive to additional traffic flow projected to occur between the 2026 Scenario 1a and 2026 Scenario 3 which illustrates the impacts of the 'urban extension development trajectory' in addition to 2026 Scenario 1a.
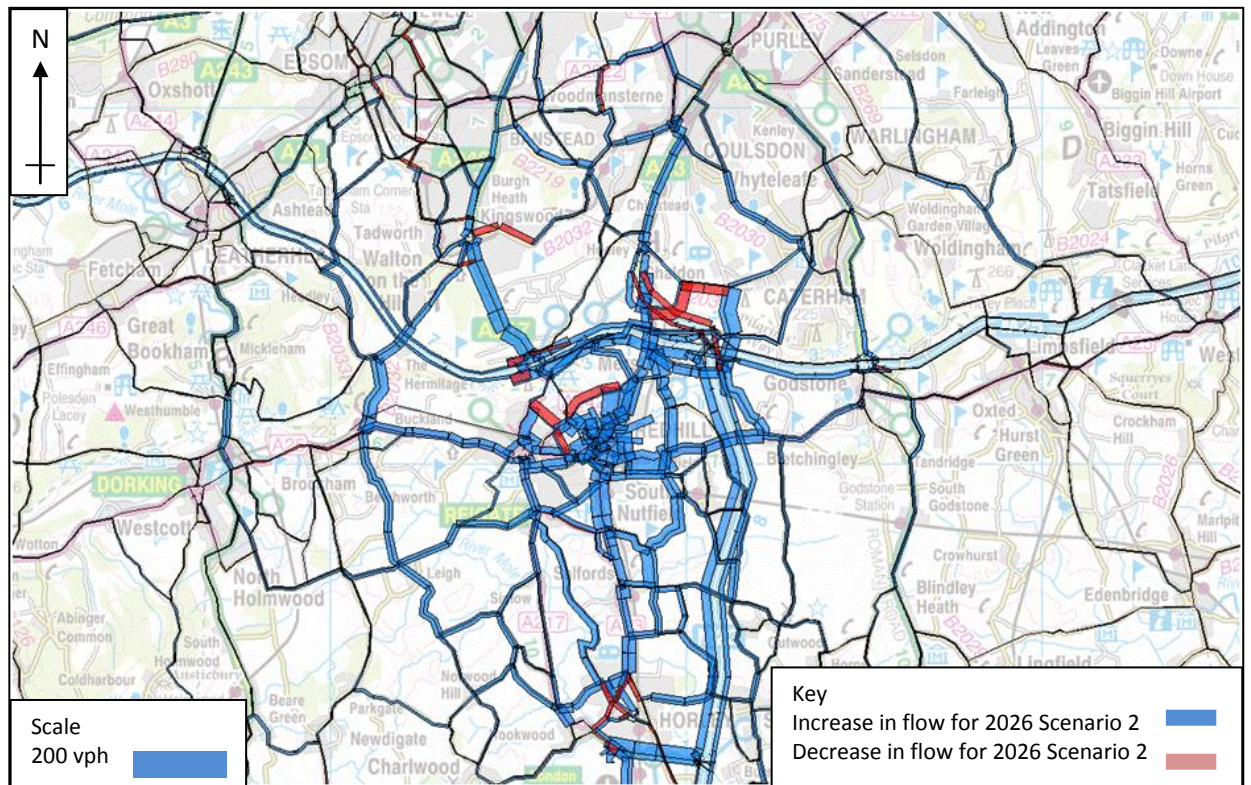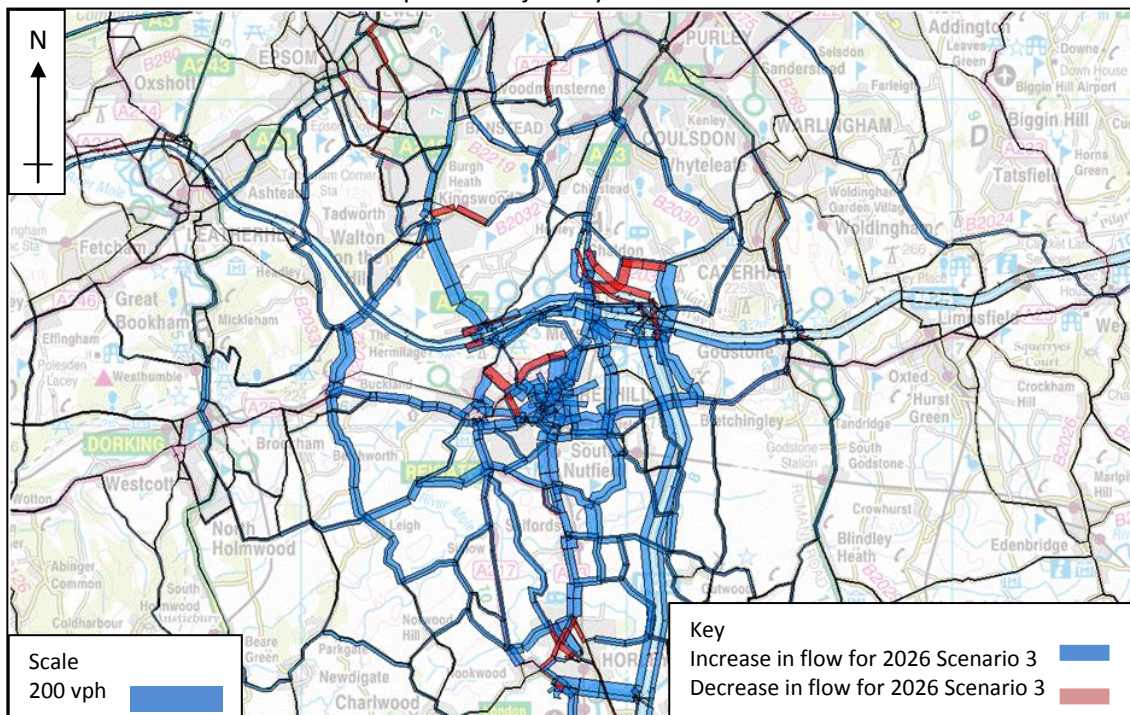

Figure 3.4: 2026 Scenario 3 flows less 2026 Scenario 1a flows

3.3.21 Table 3.6 displays the roads most sensitive to additional flow projected to occur between the 2026 Scenario 1a and 2026 Scenario 3. The ranking shows the sensitivity of the road to additional flow as a result of the 'urban extension development trajectory' in relation to either the SRN or LRN and overall across the borough for all 675 modelled links.

Link No.	Road Nos.	Road Name	Capacity (pcu/hr)	2026 Scenario 1a Flow (pcu/hr)	2026 Scenario 3 Flow (pcu/hr)	Absolute Diff in Flow (pcu/hr)	% Diff in Flow	Rank	Overall Rank
SRN									
17577	M25	J8	7600	5,565	5,667	102	1.8%	1	3
11940	M25	J7-8	7600	7,023	7,102	79	1.1%	2	13
12308	M25	J8 Slip Off to A217	5100	1,583	1,650	67	4.2%	3	22
4253	M23*	J9a-9	3800	1,077	1,142	65	6.0%	4	30
12306	M25	J8 Slip Off to A217	5100	2,319	2,383	64	2.8%	5	32
8859	M25	J8-7	7600	6,639	6,701	62	0.9%	6	34
11982	M23	J8-9	5700	5,497	5,556	59	1.1%	7	46
11959	M23	J8 Slip Off to M25 E	3800	2,274	2,330	55	2.4%	8	55
11960	M23	J8 Slip Off to M25 E	3800	2,466	2,520	54	2.2%	9	59
11963	M25	J7 Slip Off to M23 N	3800	3,212	3,263	51	1.6%	10	62
11965	M25	J7 Slip Off to M23 S	3800	3,121	3,169	48	1.5%	11	74
11957	M23	J8 Slip Off to M25 E	3800	4,743	4,790	47	1.0%	12	81
9931	M23	J9-8	5700	5,340	5,383	43	0.8%	13	94
4253	M23*	J9a-9	3800	2,768	2,805	37	1.3%	14	130
11973	M25	J8	7600	5,580	5,611	31	0.6%	15	151
8892	M25	J8 Slip On E	3800	1,059	1,090	31	2.9%	16	158
10658	M25	J9-8	7600	6,316	6,344	28	0.4%	17	187
11950	M25	J 7-8	5700	4,557	4,582	25	0.5%	18	234
12307	M25	J8 Slip Off to A217	5100	1,391	1,414	24	1.7%	19	245
11939	M25	J8-9	7600	6,876	6,889	13	0.2%	20	377
LRN									
17589	A25	Nutfield Road	800	509	681	172	33.8%	1	1
9402	A25	Castlefield Street	1600	1,317	1,433	116	8.8%	2	2
15673	Unc	Lumley Road	800	521	610	88	17.0%	3	5
9222	A25	Princess Way	1600	1,051	1,137	86	8.2%	4	6
16111	A23	London Road North	3500	674	758	84	12.5%	5	7
8311	A23	London Road North	1700	674	758	84	12.5%	6	7
8896	A217	London Road	800	758	842	84	11.1%	7	10
17589	A25	Nutfield Road	800	302	385	83	27.4%	8	11
17528	A25	Station Rd	800	535	615	79	14.8%	9	12
17525	A23	Brighton Road	800	1,112	1,191	79	7.1%	10	16
12390	A23	London Rd	3500	1,773	1,845	72	4.1%	11	17
8317	A23	Brighton Road	1400	1,773	1,845	72	4.1%	12	17
8316	A23	London Rd	1400	1,773	1,845	72	4.1%	13	17
8936	A25	Princess Way	1600	1,278	1,349	72	5.6%	14	20
17588	A25	Nutfield Road	800	457	528	71	15.5%	15	21
8272	B2219	Holly Lane	1200	304	371	67	22.1%	16	23
8273	B2219	Holly Lane	800	304	371	67	22.1%	17	23
17570	A217	Reigate Hill	800	904	971	67	7.4%	18	25
17526	A23	Brighton Road	800	903	969	67	7.4%	19	27
8275	B2219	Lower Park Road	800	621	687	66	10.6%	20	28

Table 3.6: Roads most sensitive to additional traffic between 2026 Scenario 3 flows less 2026 Scenario 1a

3.3.22 Figure 3.4 indicates that the 'urban extension development trajectory' has relatively minor impacts on the SRN, which is confirmed by the low 'overall ranking position' shown in Table 3.6, as only two links are ranked inside the top 20. The mainline through M25 Junction 8 (Reigate Hill) towards Junction 7 (Merstham) has the greatest increase of 102 or 1.8%. Traffic flows on the rest of the SRN generally increase by less than 80 passenger car units or less.

3.3.23 Figure 3.4 also indicates that the 'urban extension development trajectory' also has relatively minor impacts on the LRN, which is confirmed by the 'overall ranking positions' shown in Table 3.6. The A25 Nutfield Rd incurs the greatest increase in additional traffic, and is predicted to increase from 509 to 681 an increase of 172 or 33.8%. The rest of the A25 and A23 near the town centre generally increases by less than 100 passenger car units or >20%.

3.3.24 Figure 3.5 displays the roads most sensitive to additional traffic flow projected to occur between the 2026 Scenario 2 and 2026 Scenario 3 which illustrates the impacts of the 'urban extension development trajectory' in isolation.
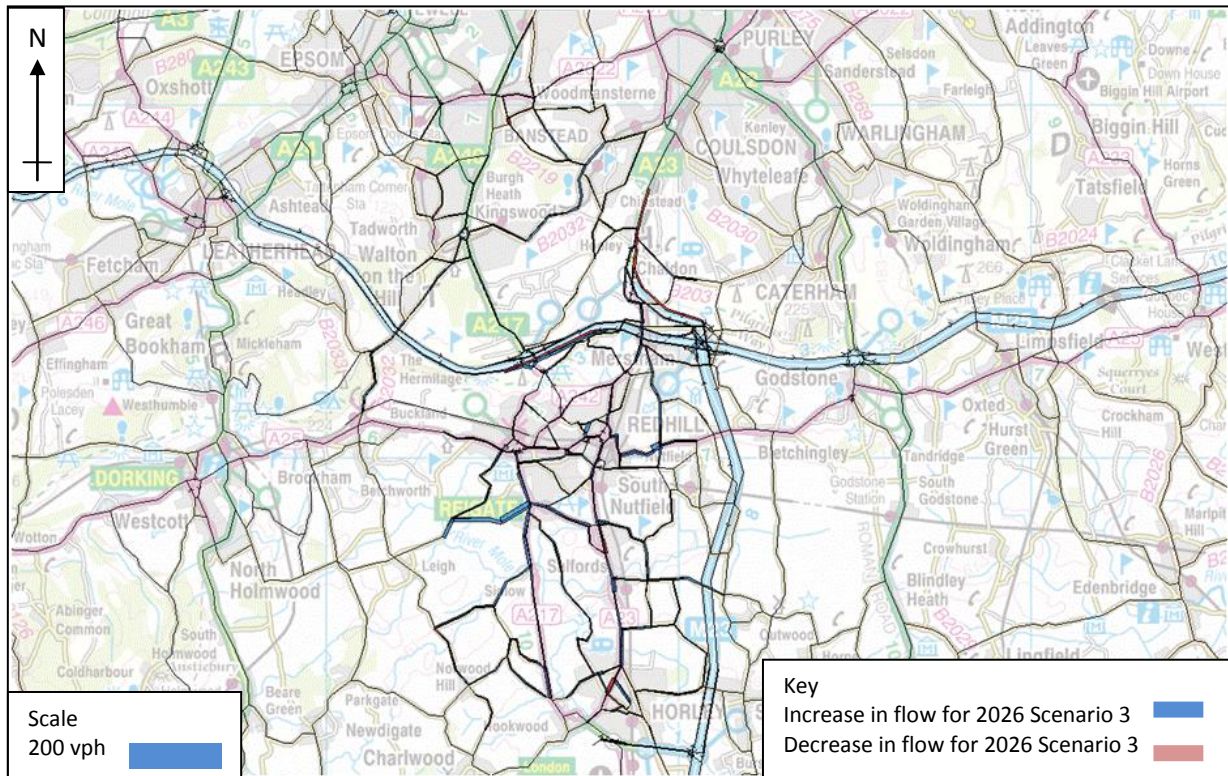
Figure 3.5: 2026 Scenario 3 flows less 2026 Scenario 2 flows

3.3.25 Table 3.7 displays the roads most sensitive to additional flow projected to occur between the 'urban extension development trajectories' against the 'high development trajectory'. The ranking shows the sensitivity of the road to additional flow as a result of in relation to either the SRN or LRN and overall across the borough for all 675 modelled links.

Link No.	Road Nos.	Road Name	Capacity (pcu/hr)	2026 Scenario 2 Flow (pcu/hr)	2026 Scenario 3 Flow (pcu/hr)	Absolute Diff in Flow (pcu/hr)	% Diff in Flow	Rank	Overall Rank
SRN									
11059	M25	J8 Slip Off to A217	5,100	2,872	2,925	53	1.9%	1	4
17840	M25	J8 Slip On CW	1,900	1,222	1,272	50	4.1%	2	7
8818	M25	J8 Slip Off to A217	3,800	1,435	1,484	49	3.4%	3	8
12305	M25	J8 Slip Off to A217	3,400	2,849	2,892	43	1.5%	4	10
8859	M25	J8-7	7,600	6,701	6,727	26	0.4%	5	46
11965	M25	J7 Slip Off to M23 S	3,800	3,169	3,193	23	0.7%	6	60
11963	M25	J7 Slip Off to M23 N	3,800	3,263	3,286	23	0.7%	7	63
11950	M25	J 7-8	5,700	4,582	4,601	19	0.4%	8	83
11939	M25	J8-9	7,600	6,889	6,907	18	0.3%	9	95
11940	M25	J7-8	7,600	7,102	7,119	17	0.2%	10	104
9931	M23	J9-8	5,700	5,383	5,399	16	0.3%	11	109
9930	M23*	J8-9	5,700	5,383	5,399	16	0.3%	12	109
8892	M25	J8 Slip On E	3,800	1,090	1,104	13	1.2%	13	157
11973	M25	J8	7,600	5,611	5,623	12	0.2%	14	181
4253	M23*	J9a-9	3,800	1,142	1,150	8	0.7%	15	258
4253	M23*	J9a-9	3,800	2,805	2,812	7	0.2%	16	291
11957	M23	J8 Slip Off to M25 E	3,800	4,790	4,795	6	0.1%	17	318
10658	M25	J9-8	7,600	6,344	6,349	4	0.1%	18	358
11959	M23	J8 Slip Off to M25 E	3,800	2,330	2,333	4	0.2%	19	368
12308	M25	J8 Slip Off to A217	5,100	1,650	1,653	3	0.2%	20	387
LRN									
17589	A25	Nutfield Road	800	385	469	84	21.9%	1	1
8905	C223	Prices Lane	800	897	962	65	7.3%	2	2
8913	C223	Slipshatch Road	1200	481	537	56	11.7%	3	3
9917	C58	Flanchford Road	1200	554	606	52	9.3%	4	5
17534	B2034	Blackborough Rd	800	547	598	51	9.4%	5	6
17548	C224	Linkfield Lane	800	630	671	41	6.5%	6	11
9205	C224	Linkfield Lane	800	592	633	41	6.9%	7	12
8903	A217	Cockshot Hill	800	953	988	35	3.7%	8	13
8905	C223	Prices Lane	800	1,010	1,045	34	3.4%	9	14
16130	A217	Dovers Green Road	800	677	711	34	5.0%	10	15
17588	A25	Nutfield Road	800	528	561	33	6.3%	11	17
15673	Unc	Lumley Road	800	610	643	33	5.4%	12	18
17592	A23	London Road North	800	897	929	32	3.6%	13	19
11834	A23	Horley Road	1700	1,187	1,218	31	2.6%	14	20
8278	B2032	Outwood Lane	800	489	520	31	6.3%	15	21
17523	A23	Bonehurst Road	1700	1,269	1,299	30	2.4%	16	22
17533	B2034	Blackborough Rd	800	629	659	30	4.8%	17	24
17523	A23	Bonehurst Road	3400	1,175	1,204	29	2.5%	18	25
17589	A25	Nutfield Road	800	681	710	29	4.3%	19	26
12372	A23	3 Arch Road	800	347	376	29	8.4%	20	27

Table 3.7: Roads most sensitive to additional traffic between 2026 Scenario 3 flows less 2026 Scenario 2

3.3.26   Figure 3.5 indicates that the impacts of additional traffic between Scenarios 2 and 3 are minimal for either the SRN or LRN. In relation to the SRN the traffic flows are not expected to increase by more than 50 vehicles for any section of the SRN.

3.3.27   In terms of LRN the roads that are forecast to have the greatest additional traffic flow in 2026 Scenario 3 are those in the modelled zones planned to contain the additional residential developments, namely zones 518 (Reigate – Doversgreen & South Park) and 163 (Redhill – Holmethorpe East). The roads in and surrounding zone 518 are Slipshatch Road/Prices Lane and Flanchford Road, and the A25 Nutfield Road near zone 163. However, the additional increases in traffic on all these roads in Scenario 3 are minimal, ranging from approximately 50 vph to 80 vph and are unlikely to cause any additional disruption to the highway network compared to scenario 2 the 'high development trajectory'.

3.4   Highway Capacity

3.4.1   Roads that experience congestion due to the different development scenarios options can be assessed by comparing the link volume to capacity ratio (VCR). In general, if a road is modelled as having a VCR value greater than 0.85 then it is likely to experience periods of congestion resulting in flow breakdown as well as increased travel times leading to a reduction in journey time reliability.

3.4.2   Figures 3.6 to 3.11 illustrate the impacts that the estimated additional flow can have on road capacity resulting in roads that are likely to experience congestion and associated problems due to the development scenarios. The plots display the flow of a link using passenger car units per hour (pcu/h). For reference, a car is equal to 1 pcu and an HGV is equal to 2 pcu's, as in general terms an HGV occupies the same length of road as 2 cars.

3.4.3   Figure 3.6 displays the impacts between the 2009 base and 2026 Scenario 1a, which illustrates the cumulative impacts of background growth and committed development. The following criteria were used to highlight capacity / congestion problem locations.

- traffic flow increases by >100 pcu's and /or by 5% (dark blue band)
- upper scenario VCR >0.85 and /or increases >5% and where flow > 50 (light blue - black edge).

Note: The criteria defined for displaying Figures 3.6 to 3.11 is for indicative purposes only but as a guide most single carriageways have a road capacity of approximately 1000 vehicles per hour so an increase of 100 vehicles would be an increase of 10% .

3.4.4   Figure 3.6 shows that using the values stated above, most links experience an increase in additional flow (dark blue band) but the impacts on highway capacity (light blue - black edge band) are limited to a number of specific locations as defined by those links that display both (dark blue) and (light blue – black edged) bands, these occur at:

- M25 (Junction 7-Junction 8 & Junction 8-Junction 9)
- A240 near Burgh Heath (Banstead)
- A23 Brighton Rd near Meath Green, B2026 Balcombe Rd (Horley)
- A217 between Woodhatch and the town centre, A25 near Reigate Heath and Raglan Rd (Reigate)
- A23 (Town Centre to Merstham), A25 Reigate Rd and B2034 Blackborough Rd (Redhill)

3.4.5   Figures 3.7 to 3.11 displays the '**additional impacts'** between the various scenarios and highlights the locations where the additional traffic due to the **'proposed development trajectories'** will either exacerbate locations with congestion / capacity issues as stated in para. 3.4.4 or create new problem locations, these were identified using the following criteria:

- traffic flow increases by 50 pcu's and / or by 5% (thin red band)
- upper scenario VCR >0.85 and / or increases >5% where flow >50 (pink - black edge)

Note: The criteria defined for displaying Figures 3.7 to 3.11 is for indicative purposes only

3.4.6   The impacts between the various development trajectories in Figures 3.7 to 3.11 are displayed 'on top' of the base and committed development impacts (Figure 3.6) to illustrate whether these impacts exacerbate existing / future problems due to committed development locations and background growth or create new problem locations.
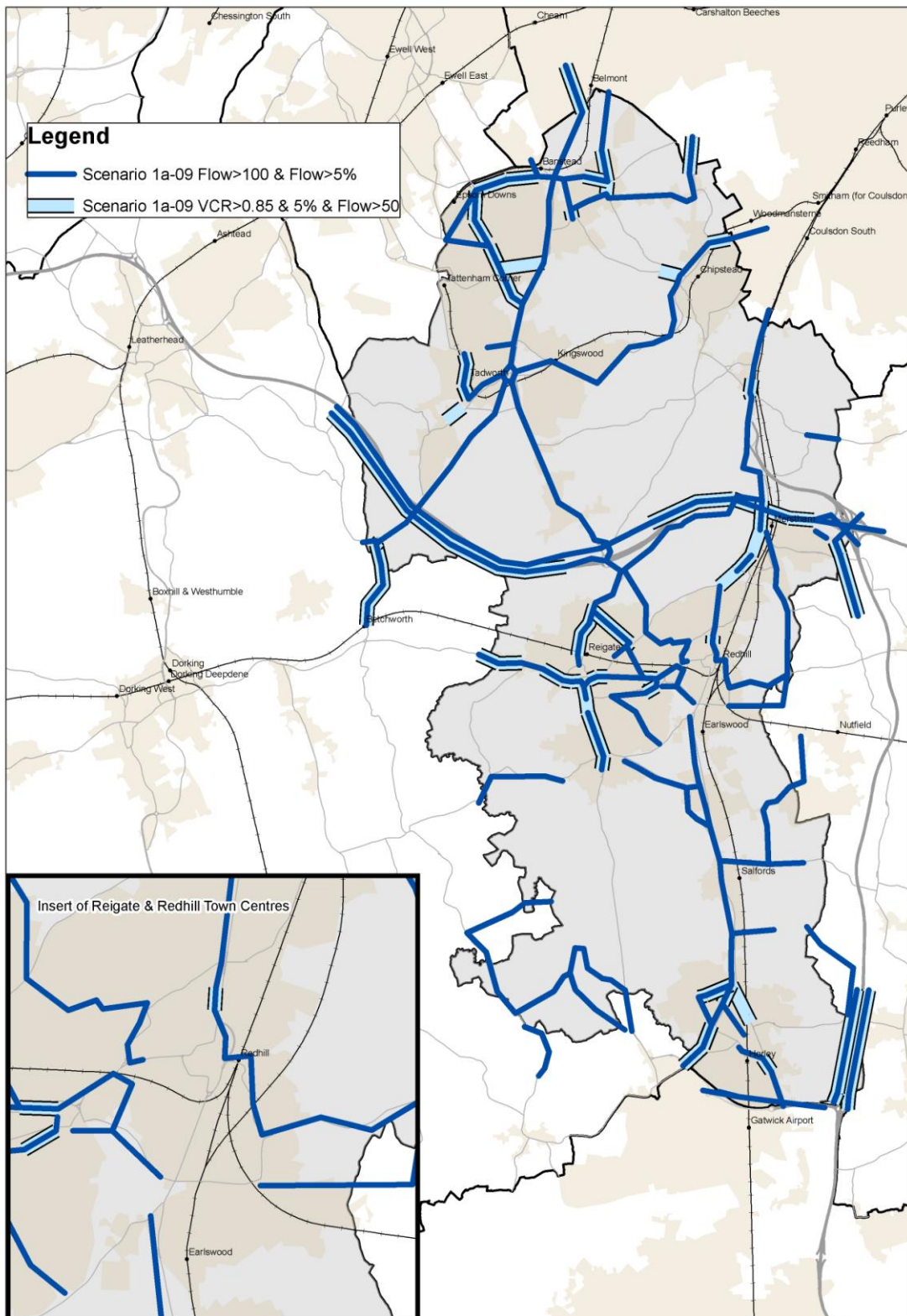
Figure 3.6: Roads sensitive to additional traffic and congestion between 2009 base and 2026 Scenario 1a
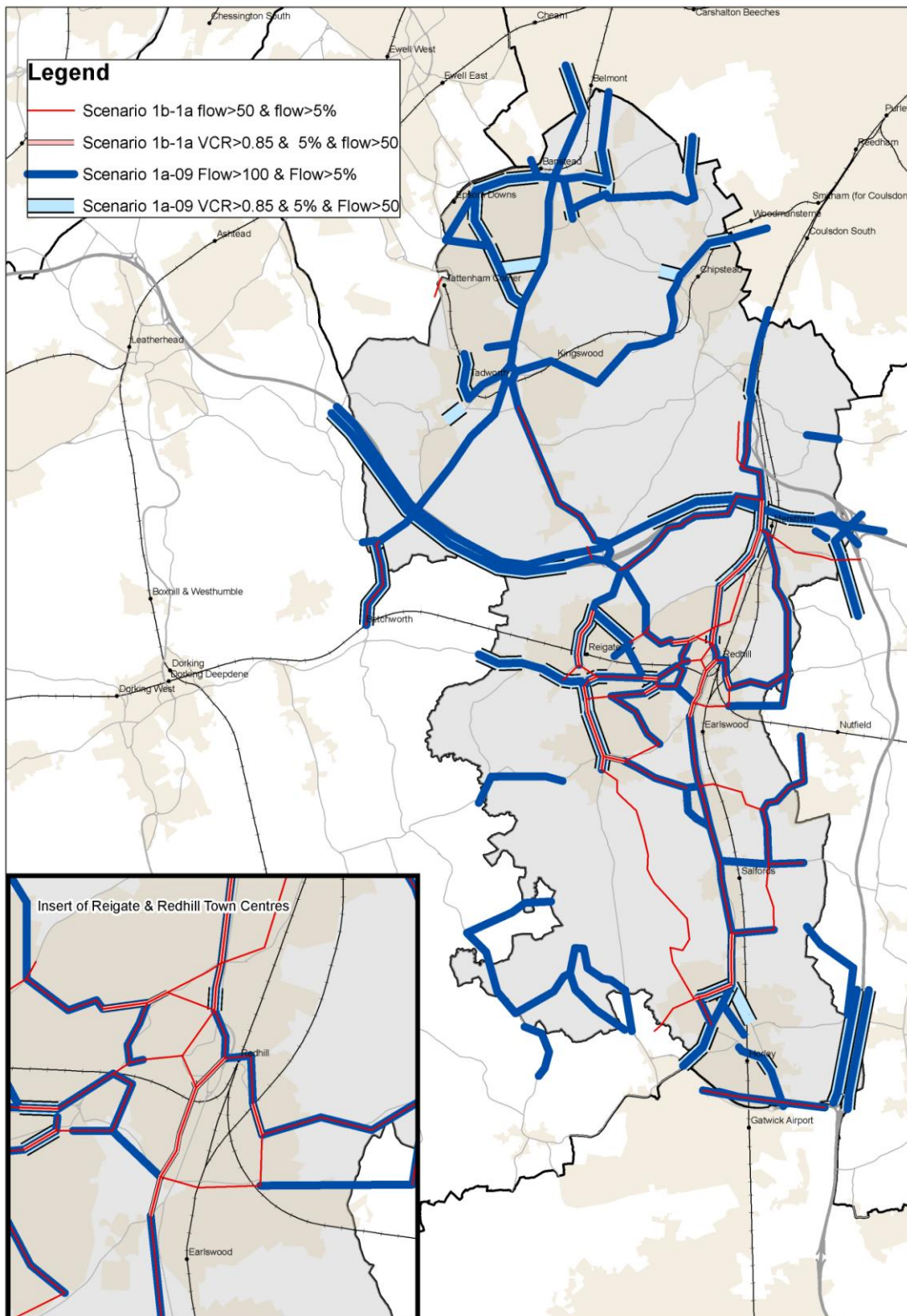
Figure 3.7: Roads sensitive to additional traffic and congestion between 2026 Scenario 1a and 2026 Scenario 1b
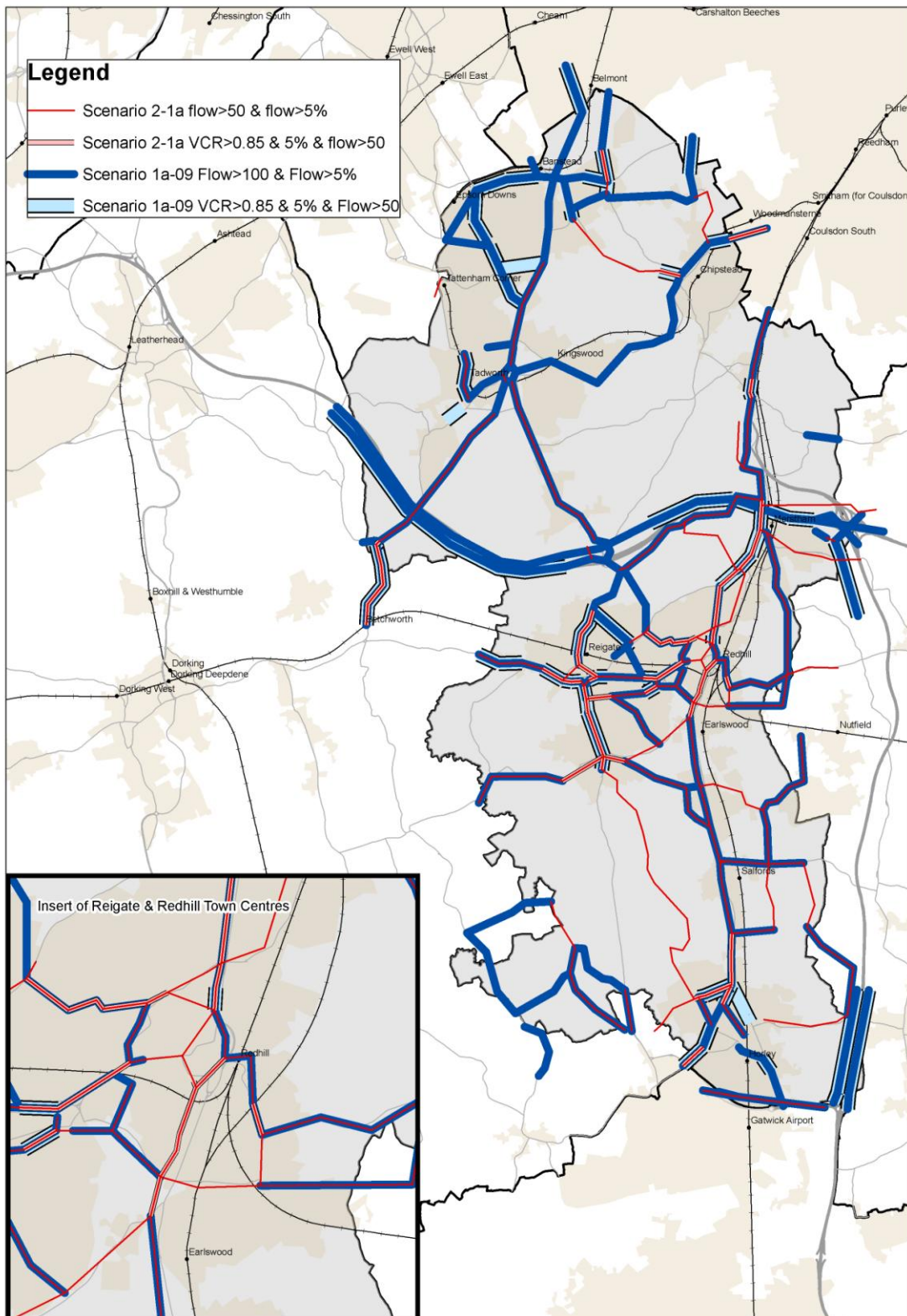
Figure 3.8: Roads sensitive to additional traffic and congestion between 2026 Scenario 1a and 2026 Scenario 2
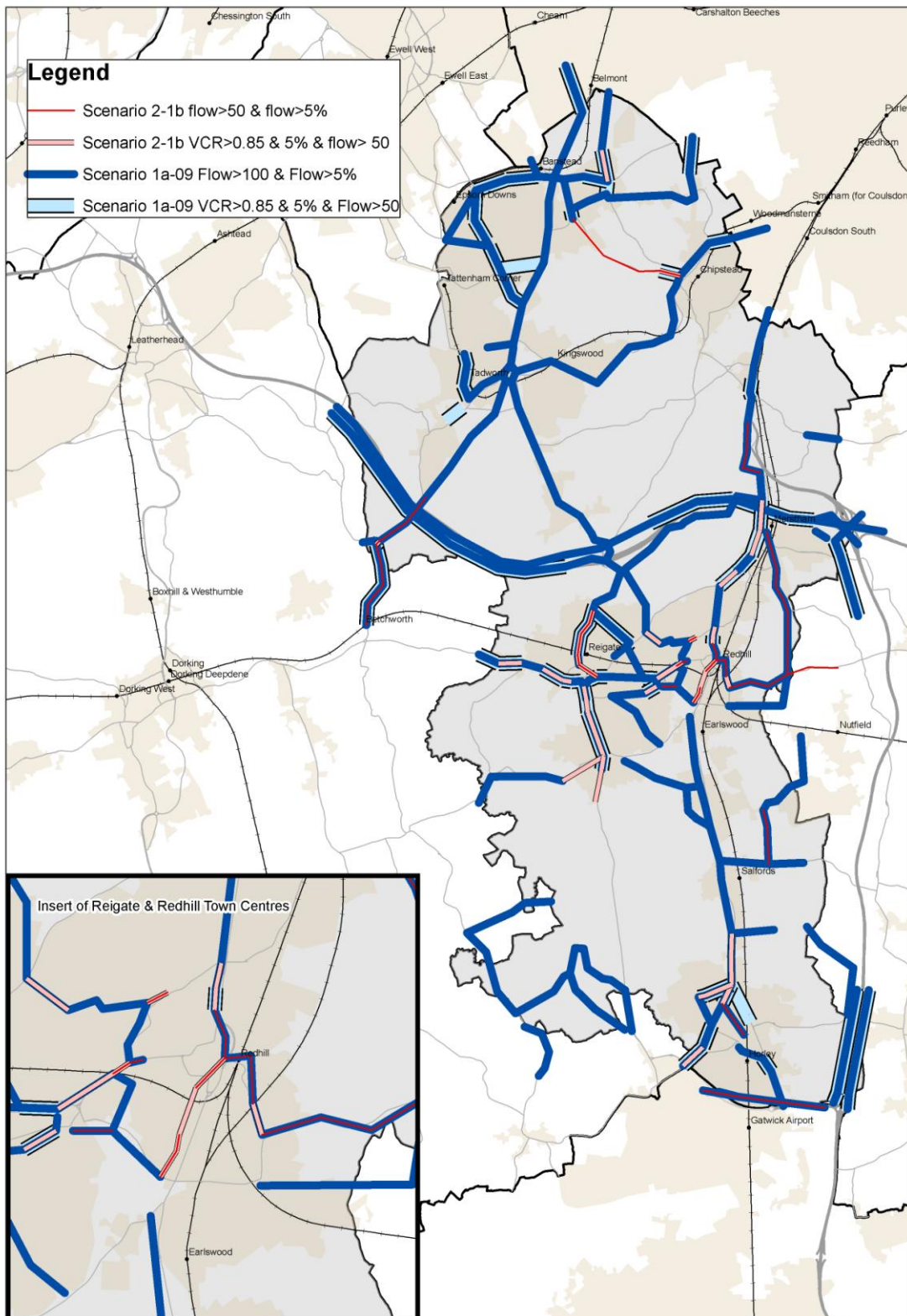
Figure 3.9: Roads sensitive to additional traffic and congestion between 2026 Scenario 1b and 2026 Scenario 2
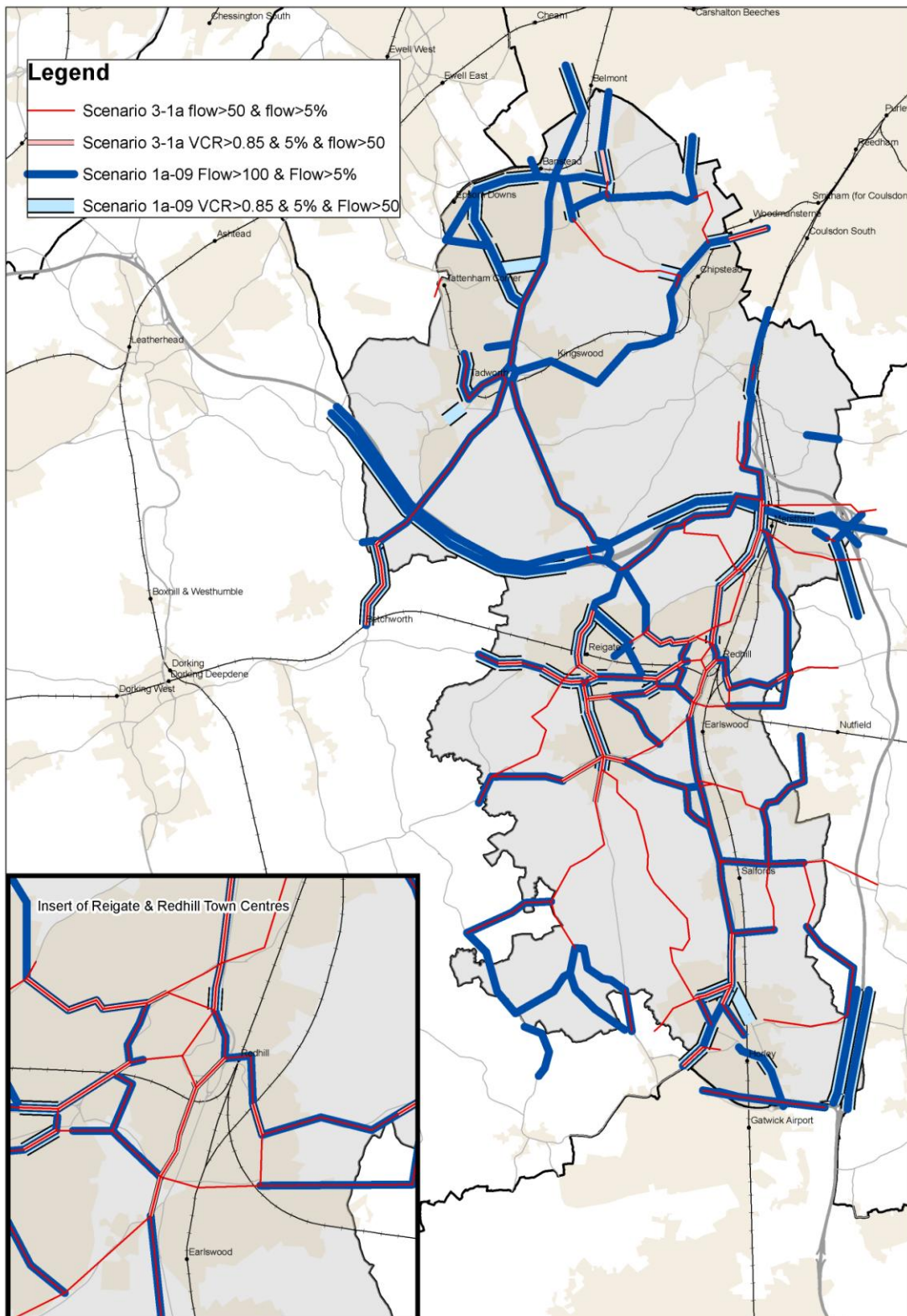
Figure 3.10: Roads sensitive to additional traffic and congestion between 2026 Scenario 1a and 2026 Scenario 3
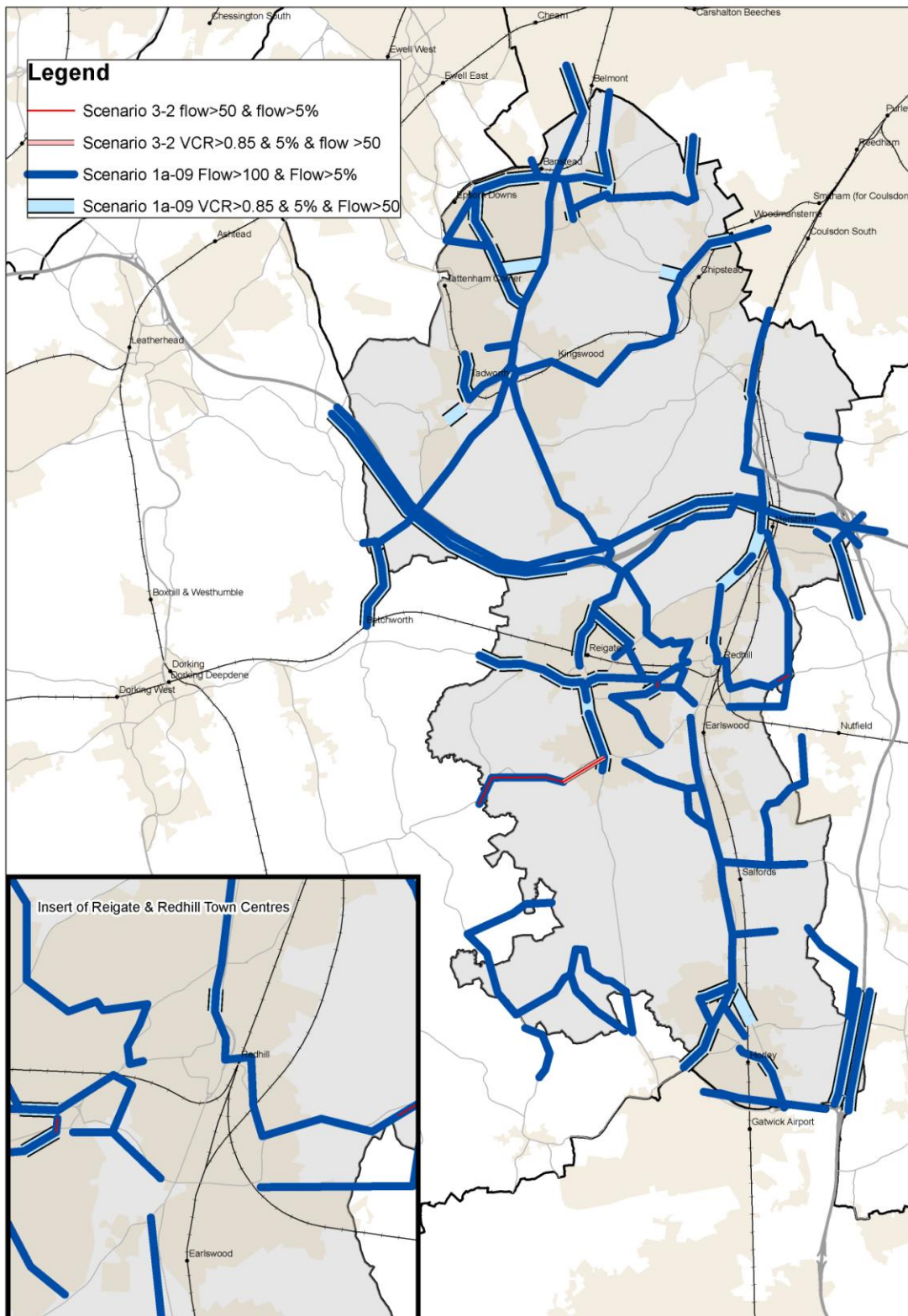
Figure 3.11: Roads sensitive to additional traffic and congestion between 2026 Scenario 3 and 2026 Scenario 2

3.4.7   The thin red bands in Figures 3.7 to 3.11 highlight those roads that experience an additional increase in traffic flow of 50 or more vehicles, where these appear in isolation it is unlikely that these will have any impacts, if this additional flow then exceeds the VCR threshold the thin red band sits on top of the pink band with a black edge. When this occurs 'on top' of the base and committed development impacts (blue bands) this is where it exacerbates known problem locations. If the thin red band and pink band with black edge occurs with no 'blue bands' then that particular development trajectory scenario creates new capacity / congestion problem locations.

3.4.8   Figures 3.7 to 3.11 indicate that when using the criteria specified in paragraph 3.4.5 there is minimal impact to the SRN in terms of additional traffic or congestion for the various development trajectory scenarios over and above the impacts of the background growth and committed development in Scenario 1a.

3.4.9   As to be expected most of the impacts occur on the LRN. Further analysis of the data used to produce Figures 3.7 to 3.11 suggests that the various **'proposed development trajectories'** will further exacerbate the congestion / capacity issues at some of these road locations stated in paragraph 3.4.4 and shown in Figure 3.6 which are expected to occur between the base and 2026 Scenario 1a (Committed development).

- A217 Reigate Hill and Bell St (Reigate Town Centre)
- A217 Cockshot Hill and Dovers Green Rd (South of Reigate);
- A23 London Rd North (Redhill to Merstham);
- A23 High St (Redhill Town Centre)
- B2034 Blackborough Rd (Reigate)

3.4.10   When considering the impacts of just the proposed development trajectories Figures 3.7 to 3.11 against scenario 1a or other appropriate reference case the analysis suggests that these '**additional**' road locations are likely to experience congestion / capacity issues specifically related to the planned development trajectory scenarios: 1b (cautious) and 2 (high) trajectories, these locations are:

- **A217 London Rd (Reigate Town Centre)**
- **A23 London Rd (N) & (S) (Redhill to Merstham);**
- **A23 Marketfield Way (South of Redhill Town Centre)**
- **A23 Brighton Rd (Redhill Town Centre)**
- **A23 Brighton Rd (Salfords)**
- **C224 Linkfield Lane**
- **Horley Row (Meath Green\ Horley)**

3.4.11   Figure 3.11 compares Scenario 3 (Urban Extension) trajectory to Scenario 2 (High) trajectory and suggests that the only road location likely to experience congestion / capacity issues specifically related to the (urban extension) is:

- **Prices Lane (Doversgreen)**

3.4.12   Mitigation is not considered as part of this assessment but any improvements required for the locations mentioned above, specifically Redhill, should be considered within the Town Centre Area Action Plan Framework. Further feasibility work will be required for the other locations to determine what capacity or traffic management measures are applicable.

3.5 Junction Delay

3.5.1 Table 3.8 shows the junctions in Reigate & Banstead that are forecast to experience the greatest increase in junction delays (Veh Hrs) during the average AM peak hour (0700 – 1000). .*Note: Only junctions experiencing increases in delays are shown in Table 3.8.*

3.5.2 Table 3.8 is ranked based on the greatest absolute differences in (Veh Hrs) between scenario 1a (committed) and scenario 1b (cautious) trajectory **(in bold)** and shows that in general terms junctions along the A23 corridor are most sensitive to increases in junction delays. It can be seen that the differences in junction delay decreases when comparing the other development scenario differences. From the junctions displayed in Table 3.8 it can be seen that the differences in junction delay decrease between 2026 Scenario 2 and 2026 Scenario 3 is minimal.

3.5.3 Table 3.9 assesses junction performance between the various development scenarios. The performance of the junctions has been based on both junction delay and additional traffic flow using the range of criteria set out below:

- Veh Hrs >5% & Flow >100 and %Flow >5%; and
- Veh Hrs >10% & Flow >200 and %Flow >10%

Note: The criteria defined for displaying Table 3.9 is for indicative purposes only

3.5.4 In Table 3.9 ✖   represents whether the junction performance exceeds the criteria threshold above and hence may need some improvement measures whereas ✓ represents that the performance of the junctions is within the thresholds and hence would operate within current parameters.

3.5.5 Table 3.10 shows the junctions sensitive to increases in junction delay and additional flow between the other scenario development trajectories and illustrates the impacts on junction performance based on the same criteria as above and effectively shows which junctions suffer additional delays and hence may require 'some improvement measures' due to the various development trajectories. Where appropriate some comments have been provided about possible improvements measures.

3.5.6 Analysis suggests that 7 junctions including 4 along the A23 may require 'improvement measures' due to the impacts of additional traffic between scenario 1a and scenario 1b as they meet both criteria ranges set out above and of these 7 only 4 would required improvements between scenario 2 and scenario 1b. The table suggests that no junctions would need further improvements due to the additional traffic between scenario 2 and scenario 3. These junctions should be further assessed .

3.5.7 Figure 3.12 displays the locations of the most sensitive junctions to the development scenario compared against the relevant reference case. These additional impacts are displayed 'on top' of those shown between the base and committed development impacts (Scenario 1a) to illustrate whether these impacts exacerbate existing / future problem locations due to background growth or create new problem locations due to the additional development within the core strategy.

3.5.8 Figure 3.12 indicates that the majority of the 'sensitive junctions' with the greatest increase in junction delays occurs between scenario 1a and scenario 1b and between scenario 1b and scenario 2 along the A23 and in Redhill town centre.

Node	Junction	Type	Absolute Junction Delay (Veh Hrs)					Absolute Differences Junction Delay (Veh Hrs)					
			2009	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 1a	2026 Scen 3 less 2026 Scen 2
13282	**A23 Bonehurst Rd, B2036 Balcombe Rd, A23 Brighton Rd, Horley Row**	Rdabt	24.7	60.8	90.5	111.9	128.4	36.1	**29.7**	51.1	21.4	67.6	16.5
14532	Vicarage Ln, Mill Ln, Horley Row	Priority	5.3	2.9	30.1	13.8	13.5	-2.3	**27.2**	10.8	-16.3	10.6	-0.2
15753	A242 Croydon Rd, Raglan Rd	Priority	34.2	26.4	48.4	44.5	43.9	-7.8	**22.0**	18.1	-3.9	17.4	-0.6
14659	**A23 Brighton Rd, Dean Ln**	Priority	4.8	64.4	84.0	94.6	98.1	59.6	**19.5**	30.2	10.6	33.6	3.4
13095	**A23 Brighton Rd, Star Ln**	Priority	65.1	99.4	115.8	139.8	142.2	34.2	**16.4**	40.4	24.0	42.8	2.4
13298	A217 Brighton Road, M25 J8 Slip On S'bound - Reigate Hill Interchange	Signal	102.6	175.5	189.7	207.8	209.1	72.9	**14.2**	32.3	18.1	33.5	1.2
14132	A217 Reigate Hill - Reigate Hill Interchange	Signal	18.3	77.9	90.1	92.3	97.8	59.6	**12.3**	14.4	2.1	19.9	5.5
14542	A217 Brighton Rd South - Tadworth Roundabout	Signal	22.5	33.2	44.4	56.6	59.9	10.7	**11.2**	23.4	12.2	26.7	3.3
13317	**A23 London Rd South, School Hill**	Priority	8.8	16.0	26.3	34.9	38.7	7.2	**10.3**	18.9	8.7	22.7	3.8
13433	B290 Station Approach, B2220 Tadworth St	Signal	12.0	48.5	56.9	63.0	64.3	36.5	**8.4**	14.5	6.1	15.7	1.3
13315	**A23 London Rd, Frenches Rd, Linkfield Ln**	Signal	9.2	10.5	16.9	19.1	19.6	1.3	**6.4**	8.5	2.1	9.1	0.6

Node	Junction	Type	Absolute Junction Delay (Veh Hrs)					Absolute Differences Junction Delay (Veh Hrs)					
			2009	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 1a	2026 Scen 3 less 2026 Scen 2
13313	**A23 Brighton Rd, Hooley Ln, Mill St**	Signal	15.2	18.4	24.0	29.9	32.0	3.2	**5.6**	11.5	5.9	13.7	2.1
15667	A23 London Rd, New Battlebridge Ln	Signal	29.0	28.4	33.7	37.5	38.1	-0.6	**5.3**	9.1	3.9	9.7	0.6
13283	A23 Brighton Rd, Victoria Rd, Vicarage Ln	Signal	17.5	33.7	38.9	38.8	39.9	16.2	**5.2**	5.1	0.0	6.2	1.1
13073	A217 Brighton Road (N), Tadworth Roundabout	Signal	18.1	57.7	62.1	67.9	68.7	39.6	**4.4**	10.2	5.9	11.0	0.8
13314	A25 Queens Way, A23 London Road, A23 Princess Way	Rdabt	6.0	6.6	10.9	11.5	11.7	0.6	**4.3**	4.9	0.6	5.1	0.2
13307	A25 London Rd, A25 High St, Park Ln, A25 West St	Priority	2.3	56.8	60.8	65.3	66.9	54.4	**4.0**	8.6	4.6	10.2	1.6
13280	A23 Horley Rd, A23 Brighton Rd, A2044 Woodhatch Rd	Priority	4.6	6.3	10.1	11.6	10.1	1.7	**3.8**	5.3	1.5	3.8	-1.5
15571	A23 London Rd, New Battlebridge Ln	Signal	17.2	23.7	27.5	32.5	30.4	6.6	**3.7**	8.7	5.0	6.7	-2.0
14256	A240 Reigate Rd, B2221 Tattenham Way, B2221 Great Tattenhams	Signal	26.7	40.7	44.2	46.9	46.1	14.0	**3.4**	6.2	2.7	5.4	-0.8
13266	A242 Gatton Park Rd, Batts Hill, A242 Croydon Rd, Wray Ln	Rdabt	5.9	7.3	10.6	12.5	13.6	1.4	**3.3**	5.2	1.8	6.3	1.2
15761	A23 London Rd South, Rocky Ln	Priority	4.3	5.4	8.4	9.4	9.8	1.1	**3.0**	4.0	0.9	4.3	0.4

Node	Junction	Type	Absolute Junction Delay (Veh Hrs)					Absolute Differences Junction Delay (Veh Hrs)					
			2009	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 1a	2026 Scen 3 less 2026 Scen 2
15748	Linkfield Ln, Gloucester Rd	Priority	1.5	1.8	4.5	6.8	7.1	0.3	**2.7**	5.1	2.3	5.4	0.3
15762	Battlebridge Ln	Signal	3.9	13.1	15.8	17.6	19.3	9.2	**2.7**	4.4	1.7	6.1	1.7
13077	A217 Brighton Road, A2022 Winkworth Rd, A2022 Fir Tree Rd	Signal	84.9	93.4	96.0	97.2	97.8	8.5	**2.6**	3.8	1.2	4.4	0.6
13770	A23 London Rd (N), Gatton Bottom Rd	Priority	2.3	6.6	9.0	9.2	9.7	4.3	**2.4**	2.6	0.2	3.1	0.5
13412	A23 Princess Way, A25 Redstone Hill, A23 Marketfield Way	Rdabt	5.3	6.0	8.4	9.1	9.2	0.7	**2.3**	3.0	0.7	3.2	0.2
14511	A23 Brighton Rd, Massetts Rd	Signal	10.0	22.9	24.9	26.1	26.1	12.8	**2.0**	3.2	1.2	3.2	0.0
13410	A23 Marketfield Way, A23 Brighton Rd, A23 High St	Rdabt	5.6	6.0	8.0	9.4	10.0	0.4	**2.0**	3.4	1.4	4.1	0.7

Table 3.8: Junctions sensitive to the greatest increases in junction delay between the proposed development scenarios

Notes:

Junction modelling represented in a strategic model produces outputs that are approximate projections, like many other outputs. This is due to the level of detail that can be included and represented in a strategic model, and can therefore inhibit some accuracy of the modelled junction's outputs. It is important to remember that junction delay increases exponentially, thus referring to how junction delays can increase considerably once passing a certain threshold. For instance flow breakdown and queuing can cause junction delay to increase rapidly for a single junction and can also have continued effects of junction delay at other nearby junctions.

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
13282	A23 Bonehurst Rd, B2036 Balcombe Rd, A23 Brighton Rd, Horley Row	Rdabt	✖	✓	✓	✓	✖	✓	✓	✓
14532	Vicarage Ln, Mill Ln, Horley Row	Priority	✓	✖	✓	✓	✓	✓	✓	✓
13298	M25 J8 - Reigate Hill Interchange - Combined Approaches	Signal	✖	✓	✓	✓	✓	✓	✓	✓
15753	A242 Croydon Rd, Raglan Rd	Priority	✓	✓	✓	✓	✓	✓	✓	✓
14659	A23 Brighton Rd, Dean Ln	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13073	A217 Bonsor Drive (Tadworth Roundabout) Combined Approaches	Signal	✖	✓	✓	✓	✖	✓	✓	✓
13095	A23 Brighton Rd, Star Ln	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13317	A23 London Rd South, School Hill	Priority	✓	✖	✓	✓	✓	✓	✓	✓
13433	B290 Station Approach, B2220 Tadworthh St	Signal	✖	✓	✓	✓	✓	✓	✓	✓
13315	A23 London Rd, Frenches Rd, Linkfield Ln	Signal	✖	✖	✖	✓	✓	✖	✓	✓
13313	A23 Brighton Rd, Hooley Ln, Mill St	Signal	✖	✖	✖	✓	✓	✓	✓	✓
15667	A23 London Rd, New Battlebridge Ln	Signal	✓	✖	✓	✓	✓	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
13283	A23 Brighton Rd, Victoria Rd, Vicarage Ln	Signal	✗	✓	✓	✓	✗	✓	✓	✓
13314	A25 Queens Way, A23 London Road, A23 Princess Way	Rdabt	✗	✗	✓	✓	✓	✗	✓	✓
13307	A25 London Rd, A25 High St, Park Ln, A25 West St	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13280	A23 Horley Rd, A23 Brighton Rd, A2044 Woodhatch Rd	Priority	✗	✗	✓	✓	✗	✓	✓	✓
15571	A23 London Rd, New Battlebridge Ln	Signal	✗	✓	✓	✓	✓	✓	✓	✓
14256	A240 Reigate Rd, B2221 Tattenham Way, B2221 Great Tattenhams	Signal	✗	✓	✓	✓	✓	✓	✓	✓
13266	A242 Gatton Park Rd, Batts Hill, A242 Croydon Rd, Wray Ln	Rdabt	✗	✗	✓	✓	✓	✓	✓	✓
15761	A23 London Rd South, Rocky Ln	Priority	✓	✗	✓	✓	✓	✓	✓	✓
15748	Linkfield Ln, Gloucester Rd	Priority	✓	✗	✓	✓	✓	✗	✓	✓
15762	Battlebridge Ln	Signal	✓	✓	✓	✓	✓	✓	✓	✓
13077	A217 Brighton Road, A2022 Winkworth Rd, A2022 Fir Tree Rd	Signal	✗	✓	✓	✓	✓	✓	✓	✓
13770	A23 London Rd North, Gatton Bottom Rd	Priority	✗	✗	✓	✓	✗	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
13412	A23 Princess Way, A25 Redstone Hill. A23 Marketfield Way	Rdabt	✘	✘	✘	✓	✓	✘	✓	✓
14511	A23 Brighton Rd, Massetts Rd	Signal	✘	✓	✓	✓	✘	✓	✓	✓
13410	A23 Marketfield Way, A23 Brighton Rd, A23 High St	Rdabt	✓	✘	✘	✓	✓	✘	✓	✓
15769	A217 Brighton Rd, Shelvers Way	Priority	✘	✓	✓	✓	✓	✓	✓	✓
13406	Linkfield Ln, A25 Station Rd, A25 Hatchlands Rd	Rdabt	✘	✘	✘	✓	✓	✘	✓	✓
13075	A217 Brighton Road, A240 Reigate Road	Signal	✘	✓	✓	✓	✘	✓	✓	✓
13766	A217 Brighton Rd, Blackhorse Ln	Priority	✘	✘	✓	✓	✓	✓	✓	✓
14752	B278 Rectory Ln, Woodmansterne St	Priority	✘	✓	✓	✓	✘	✓	✓	✓
14413	A217 Bell St, A217 Bancroft Road	Signal	✘	✘	✓	✓	✘	✓	✓	✓
13310	A25 Redstone Hill, Redstone Hollow	Priority	✘	✘	✓	✓	✓	✓	✓	✓
14405	A23 Horley Rd, Three Arch Rd, Maple Rd -Combined approaches	Signal	✘	✘	✓	✓	✘	✓	✓	✓
13434	A25 Hatchlands Rd, B2034 Blackborough Rd, A25 Reigate Rd	Priority	✘	✘	✓	✓	✓	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
15764	A23 London Rd North, Rockshaw Rd	Priority	✘	✘	✓	✓	✘	✓	✓	✓
14255	A240 Reigate Rd, B284 Yew Tree Bottom Rd	Priority	✘	✓	✓	✓	✘	✓	✓	✓
13141	Gatton Bottom/Wray Ln, A217 Reigate Hill	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13078	B2230 Brighton Rd, A217 Brighton Rd, A217 Belmont Rise	Rdabt	✓	✓	✓	✓	✓	✓	✓	✓
13318	A23 London Rd North, B2031 Shepherd's Hill	Priority	✘	✘	✓	✓	✓	✓	✓	✓
13470	A25 Castlefield St, A25 Reigate rd, A25 Church St	Signal	✘	✘	✓	✓	✓	✓	✓	✓
13309	A242 Croydon Rd, A25 Reigate Rd, A25 Castlefield St	Signal	✘	✘	✓	✓	✓	✓	✓	✓
15261	Brook Rd and Hooley Ln	Signal	✓	✓	✓	✓	✓	✓	✓	✓
14510	A23 Brighton Rd, Lumley Rd	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13942	A23 Brighton Rd , Pendleton Rd	Priority	✘	✘	✓	✓	✓	✓	✓	✓
13068	B2032 Dorking Rd, B290 Mill Rd, B290 New Rd	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13072	A217 Brighton Rd, B290 Mill Rd	Priority	✘	✓	✓	✓	✘	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
15746	A25 Hatchlands Rd, Fangates Rd	Priority	✖	✖	✓	✓	✓	✖	✓	✓
13308	A25 Church St, A25 High St, A217 Bell St	Signal	✖	✓	✓	✓	✓	✓	✓	✓
14407	A2044 Woodhatch Rd, Pendleton Rd	Rdabt	✓	✖	✓	✓	✓	✓	✓	✓
13398	Cormongers Ln, A25 Nutfield Rd, Fullers Wood Ln	Priority	✖	✖	✖	✓	✓	✓	✓	✓
14411	A2022 Fir Tree Road, Banstead Road	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13659	Collendean Ln, Norwood Hill Rd, Norwood Hill, Smalls Hill Rd	Priority	✖	✓	✓	✓	✖	✓	✓	✓
13970	Masons Bridge Rd, Axes Ln, Picketts Ln, Honeycrock Ln	Priority	✖	✖	✓	✓	✖	✓	✓	✓
14533	A217 Dovers Green Rd, Lonesome Ln	Priority	✓	✖	✓	✓	✓	✓	✓	✓
15784	Kings Mill Ln, Masons Bridge Rd	Priority	✖	✖	✓	✓	✓	✓	✓	✓
15742	A25 Station Rd, Linkfield St	Priority	✖	✖	✖	✓	✓	✓	✓	✓
14234	A217 Brighton Rd, B2221 Tattenham Way	Signal	✖	✓	✓	✓	✖	✓	✓	✓
14423	Batts Hill, Linkfield Lane	Priority	✖	✖	✓	✓	✓	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
15741	A23 Brighton Rd, Brook Rd	Priority	✓	✗	✓	✓	✓	✓	✓	✓
14422	B2034 Blackborough Rd, Whitepost Hill	Priority	✗	✗	✓	✓	✓	✓	✓	✓
13086	B278 Rectory Ln, B2032 Chipstead Valley Rd, B2032 Outwood Ln	Priority	✗	✓	✓	✓	✓	✓	✓	✓
14514	Massetts Rd, Victoria Rd	Signal	✓	✓	✓	✓	✓	✓	✓	✓
15738	Meath Green Rd, Horley Row, Mill Ln	Priority	✓	✗	✓	✓	✓	✓	✓	✓
13301	A217 Bell St, B2034 Lesbourne Rd	Priority	✗	✓	✓	✓	✓	✓	✓	✓
15089	B290 Ashurst Rd, Shelvers Way	Rdabt	✓	✓	✓	✓	✓	✓	✓	✓
13263	B2032 Dorking Rd, B2033 Headley Common Rd	Priority	✗	✓	✓	✓	✗	✓	✓	✓
15760	Gatton Bottom, Rocky Ln	Priority	✗	✗	✓	✓	✓	✓	✓	✓
15759	A25 Reigate Rd, Wray Common Rd	Priority	✗	✗	✓	✓	✓	✓	✓	✓
13084	B2217 Sutton Ln, Park Rd, B2217 High St	Rdabt	✗	✓	✓	✓	✗	✓	✓	✓
13083	B2032 Outwood Ln, B2219 Lower Park Rd	Rdabt	✗	✓	✓	✓	✓	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
15743	Linkfield St, Mill St, Whitepost Hill	Priority	✖	✔	✔	✔	✔	✔	✔	✔
14487	B2032 Outwood Ln, Hazelwood Ln	Rdabt	✔	✔	✔	✔	✔	✔	✔	✔
14408	Pendleton Rd, Somerset Rd	Priority	✔	✖	✔	✔	✔	✔	✔	✔
15130	New Battlebridge Ln, Frenches Rd, Battlebridge Ln	Signal	✔	✔	✔	✔	✔	✔	✔	✔
13304	A217 Reigate Rd and Ironsbottom Rd	Priority	✔	✔	✔	✔	✔	✔	✔	✔
14435	Wray Ln, Gatton Bottom	Priority	✖	✔	✔	✔	✔	✔	✔	✔
13082	Park Rd, B2219 Holly Ln	Priority	✔	✔	✔	✔	✔	✔	✔	✔
13080	B2219 Bolters Ln, B2217 High St	Rdabt	✖	✔	✔	✔	✖	✔	✔	✔
15747	Linkfield St, Fangates Rd, Fairfax Rd	Priority	✖	✔	✔	✔	✔	✔	✔	✔
14257	B2032 Dorking Road, B2220 Chequers Lane	Priority	✖	✔	✔	✔	✔	✔	✔	✔
15067	Victoria Rd, Consort Way East	Signal	✖	✔	✔	✔	✔	✔	✔	✔
13279	A23 Brighton Rd. Honeycrock Ln	Priority	✔	✔	✔	✔	✔	✔	✔	✔

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
15744	B2034 Blackborough Rd, Blackstone Hill	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13432	B2220 Tadworth St, B290 New Rd, B2220 Mere Rd	Priority	✓	✓	✓	✓	✓	✓	✓	✓
14412	A2022 Winkworth Road, B2219 Bolters Lane	Rdabt	✘	✓	✓	✓	✘	✓	✓	✓
15068	Victoria Rd, Russells Crescent	Signal	✘	✓	✓	✓	✓	✓	✓	✓
15755	Wray Ln, Gatton Bottom	Priority	✘	✓	✓	✓	✘	✓	✓	✓
15745	Blackstone Hill, Whitepost Hill	Priority	✓	✓	✓	✓	✓	✓	✓	✓
15776	Woodmansterne Ln, Park Rd	Priority	✘	✓	✓	✓	✓	✓	✓	✓
13091	High Rd, Hogscross Ln	Priority	✓	✓	✓	✓	✓	✓	✓	✓
13076	A217 Brighton Road, B2219 Garratts Lane	Signal	✘	✓	✓	✓	✘	✓	✓	✓
15772	Preston Ln, B290 Ashurst Rd, B290 Epsom Ln North	Priority	✓	✓	✓	✓	✓	✓	✓	✓
15069	Massetts Rd, Russells Crescent	Priority	✘	✓	✓	✓	✓	✓	✓	✓
13940	Maple Rd, A2044 Woodhatch Rd	Priority	✘	✓	✓	✓	✓	✓	✓	✓

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%			
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
13291	B2046 Balcombe Rd, Victoria Rd	Rdabt	✘	✔	✔	✔	✔	✔	✔	✔
13088	Waterhouse Ln, B2032 Waterhouse Ln, B2032 Bonsor Dr	Priority	✔	✔	✔	✔	✔	✔	✔	✔
13074	A217 Brighton Rd, Waterhouse Ln	Priority	✔	✔	✔	✔	✔	✔	✔	✔
13290	B2036 Balcombe Rd, Smallfield Rd	Signal	✔	✔	✔	✔	✔	✔	✔	✔
13316	A23 London Rd South, A23 London Rd, A242 Gatton Park Rd	Priority	✘	✔	✔	✔	✔	✔	✔	✔
14254	A240 Reigate Rd, A2022 Fir Tree Rd, plus priority slips	Signal	✘	✔	✔	✔	✘	✔	✔	✔
13303	A217 Cockshot Hill, A2044 Woodhatch Rd, A217 Dovers Green Rd, Prices Ln	Signal	✔	✔	✔	✔	✔	✔	✔	✔
15758	A217 Reigate Hill, Raglan Rd	Priority	✘	✔	✔	✔	✔	✔	✔	✔
13079	B2218 Sutton Ln, A2022 Croydon Rd, A2022 Winkworth Rd	Rdabt	✘	✔	✔	✔	✘	✔	✔	✔

Table 3.9: Junction sensitive to increases in junction delay and additional flow between the base and scenario 1a

Notes:

Junction modelling represented in a strategic model produces outputs that are approximate projections, like many other outputs. This is due to the level of detail that can be included and represented in a strategic model, and can therefore inhibit some accuracy of the modelled junction's outputs. It is important to remember that junction delay increases exponentially, thus referring to how junction delays can increase considerably once passing a certain threshold. For instance flow breakdown and queuing can cause junction delay to increase rapidly for a single junction and can also have continued effects of junction delay at other nearby junctions.

Node	Junction	Type	Veh Hrs >5% Flow >100 and % Flow >5%				Veh Hrs >10% Flow >200 and % Flow >10%				Ranked	Comments
			2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1a less 2009 Base	2026 Scen 1b less 2026 Scen 1a	2027 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1b less 2026 Scen 1a	
13315	A23 London Rd, Frenches Rd, Linkfield Ln	Signal	✘	✘	✘	✔	✔	✘	✔	✔	1	Operating under 'MOVA' Signal Control, most appropriate method of control for this junction
13314	A25 Queens Way, A23 London Road, A23 Princess Way	Rdabt	✘	✘	✔	✔	✔	✘	✔	✔	2	Any improvements required for this junction should be considered within the Town Centre Area Action Plan Framework
15748	Linkfield Ln, Gloucester Rd	Priority	✔	✘	✔	✔	✔	✘	✔	✔	3	* Requires further capacity analysis
13412	A23 Princess Way, A25 Redstone Hill, A23 Marketfield Way	Rdabt	✘	✘	✘	✔	✔	✘	✔	✔	4	Any improvements required for this junction should be considered within the Town Centre Area Action Plan Framework
13410	A23 Marketfield Way, A23 Brighton Rd, A23 High St	Rdabt	✔	✘	✘	✔	✔	✘	✔	✔	5	Any improvements required for this junction should be considered within the Town Centre Area Action Plan Framework
13406	Linkfield Ln, A25 Station Rd, A25 Hatchlands Rd	Rdabt	✘	✘	✘	✔	✔	✘	✔	✔	6	* Requires further capacity analysis
15746	A25 Hatchlands Rd, Fangates Rd	Priority	✘	✘	✔	✔	✔	✘	✔	✔	7	* Requires further capacity analysis

Table 3.10: Most sensitive junctions to increases in junction delay and additional flow between scenario 1a and scenario 1b

Notes:

* Indicates that further analysis is required to confirm that these junctions would be at or over capacity, as some of these junctions are close to modelled zone centroids and hence experience additional flows which would occur on other access or side roads in close proximity.

Junction modelling represented in a strategic model produces outputs that are approximate projections, like many other outputs. This is due to the level of detail that can be included and represented in a strategic model, and can therefore inhibit some accuracy of the modelled junction's outputs. It is important to remember that junction delay increases exponentially, thus referring to how junction delays can increase considerably once passing a certain threshold. For instance flow breakdown and queuing can cause junction delay to increase rapidly for a single junction and can also have continued effects of junction delay at other nearby junctions.
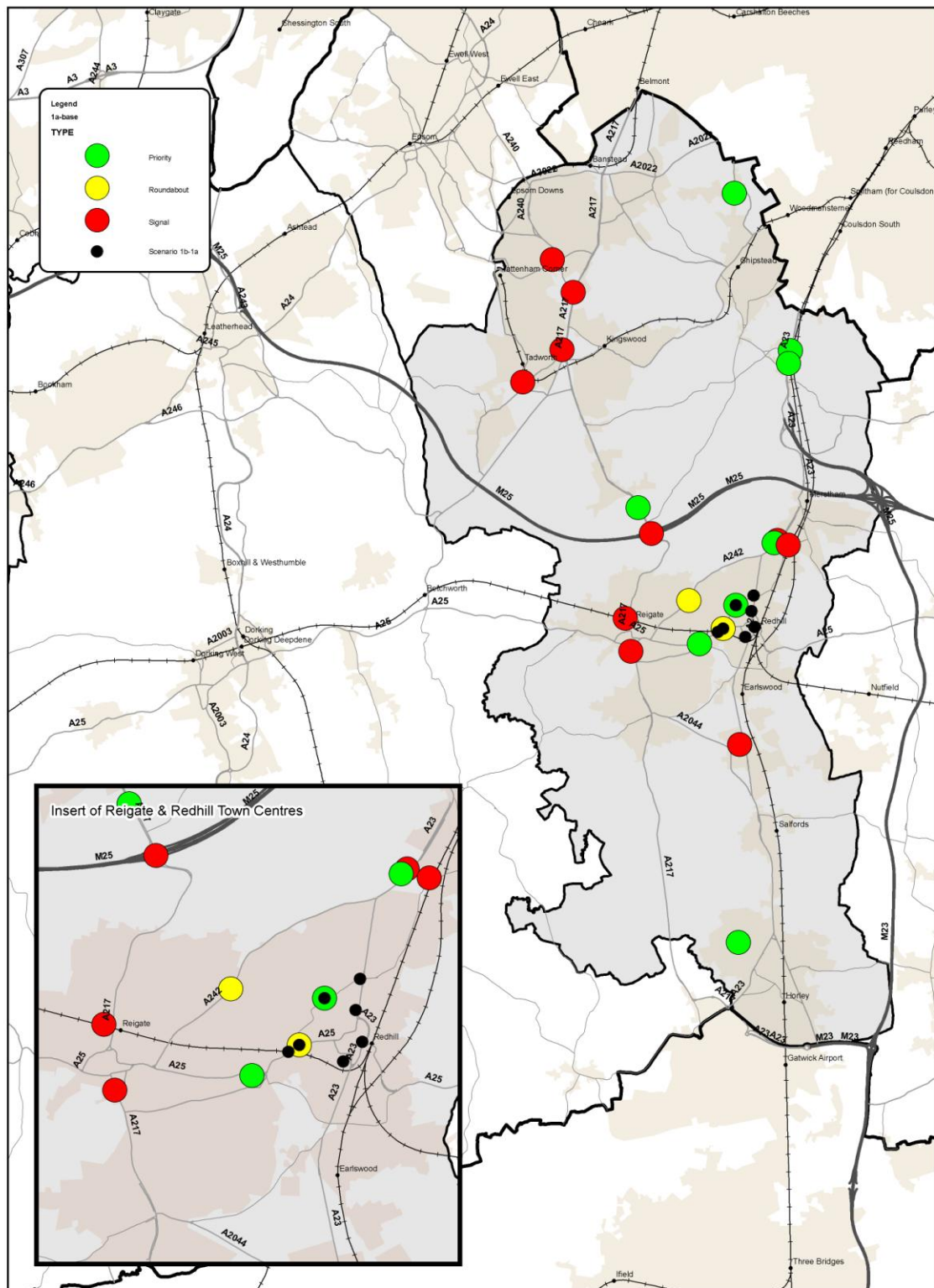
Figure 3.12: Location of top twenty junctions with the greatest increases in junction delay between 2009 Base & 2026 Scenario 1a

3.6   Local Road Network Analysis

3.6.1   The main road corridors that pass through the borough of Reigate & Banstead are the radial north-south corridors of the A217 and the A23 and the orbital east-west corridor of the A25.

3.6.2   Tables 3.11 to 3.22 present the network based summary statistics for all modelled links composing the A23, A217 and A25 that are within the borough boundaries. The summary statistics are presented separately for each direction of road i.e. the A23 and A217 northbound and southbound and the A25 eastbound and westbound. The summary statistics compare key outputs from each modelled scenario and represent all modelled vehicles.

3.6.3   The routes used for each corridor were as follows:

- The A23 at Longbridge roundabout, through Redhill town centre, the trunk road section of the A23 (N of Merstham) and terminates at the borough boundary;
- The A217 from the borough boundary near Gatwick, through Reigate town centre, over the M25 junction interchange, via Tadworth roundabout, Banstead crossroads and terminates at the junction the B2230;
- The A25 from Buckland through Reigate town centre and Redhill town centre and terminates at Cormongers Lane.

3.6.4   Tables 3.11 to 3.14 show the network summary statistics for the A23, the A217 summary network statistics are displayed in Tables 3.15 to 3.18 and Tables 3.19 to 3.22 contain the A25 network summary statistics.

3.6.5   Comparisons of the network statistics for the three main corridors in the borough suggest that the A217 is forecast to have the greatest amount of vehicle kilometres travelled in scenarios 2 and 3 compared to the other corridors. For example the A217 (northbound and southbound) are projected to have approximately 24,000 to 25,000 veh kms travelled in scenarios 2 and 3, whilst the A23 (northbound and southbound) has approximately 15,000 veh kms and the A25 (eastbound and westbound) approximately 5,000 to 6,000 veh kms.

3.6.6   Tables 3.21 to 3.22 indicate that the impacts on the key statistics between scenario 2 and scenario 3 are relatively minimal on all of the main corridors in the borough, as the greatest increases being in vehicle kilometres and vehicle hours of between 2 and 3%.

3.6.7   The network statistics for the main corridors suggest that all roads are likely to experience an increase in vehicle kilometres and vehicle hours between the 2009 base and scenarios 2 and 3 resulting in an overall reduction in average speed, the greatest reduction in speed occurs between the 2009 base and scenario 3 on the A23 southbound, with a reduction of 6.5 kph (14% reduction) reducing from 46.7 kph to 40.2 kph.

Road Type	No. of Links	Link Kms	% Link Kms
Trunk Roads	6	2	14%
Principal Roads	34	14	86%
Total	**40**	**16**	**100%**

Table 3.11: Modelled links on the A23 (N)bound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kilometres (veh kms)	Trunk Rd	2464	2,441	2,270	2,327	2,383	2,397	-23	-171	57	56	14	-1%	-7%	3%	2%	1%
	Principal Rd	10098	10,702	11,818	12,788	13,049	13,247	604	1,116	970	261	198	6%	10%	8%	2%	2%
	Total	**12,562**	**13,143**	**14,088**	**15,115**	**15,432**	**15,644**	**581**	**945**	**1,027**	**317**	**212**	**5%**	**7%**	**7%**	**2%**	**1%**
Vehicle Hours (veh hrs)	Trunk Rd	38	37	33	34	35	36	-1	-4	1	1	1	-3%	-11%	3%	3%	3%
	Principal Rd	266	289	343	386	399	408	23	54	43	13	9	9%	19%	13%	3%	2%
	Total	**304**	**326**	**376**	**420**	**434**	**444**	**22**	**50**	**44**	**14**	**10**	**7%**	**15%**	**12%**	**3%**	**2%**
Average Speed (kph)	Trunk Rd	65.3	65.6	69.2	68.8	67.9	67.4	0.3	3.6	-0.4	-0.9	-0.5	0%	5%	-1%	-1%	-1%
	Principal Rd	37.9	37.1	34.4	33.1	32.7	32.4	-0.8	-2.70	-1.3	-0.4	-0.3	-2%	-7%	-4%	-1%	-1%
	Average	**51.6**	**51.4**	**51.8**	**51.0**	**50.3**	**49.9**	**-0.3**	**0.5**	**-0.9**	**-0.7**	**-0.4**	**0%**	**1%**	**-2%**	**-1%**	**-1%**

Table 3.12: A23 (N)bound summary statistics

Road Type	No. of Links	Link Kms	% Link Kms
Trunk Roads	6	2	14%
Principal Roads	35	14	86%
Total	**41**	**16**	**100%**

Table 3.13: Modelled links on the A23 southbound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kilometres (veh kms)	Trunk Rd	2,900	3,360	3,309	3,387	3,526	3,449	460	-51	78	139	-77	16%	-2%	2%	4%	-2%
	Principal Rd	9,340	9,959	10,600	12,044	12,432	12,442	619	641	1,444	388	10	7%	6%	14%	3%	0%
	Total	**12,240**	**13,319**	**13,909**	**15,431**	**15,958**	**15,891**	**1,079**	**590**	**1,522**	**527**	**-67**	**9%**	**4%**	**11%**	**3%**	**0%**
Vehicle Hours (veh hrs)	Trunk Rd	49	64	63	66	72	69	15	-1	3	6	-3	31%	-2%	5%	9%	-4%
	Principal Rd	275	297	322	389	408	411	22	25	67	19	3	8%	8%	21%	5%	1%
	Total	**324**	**361**	**385**	**455**	**480**	**480**	**37**	**24**	**70**	**25**	**0**	**11%**	**7%**	**18%**	**5%**	**0%**
Average Speed (kph)	Trunk Rd	59.5	52.8	52.2	51.1	49.0	50.1	-6.7	-0.6	-1.1	-2.1	1.1	-11%	-1%	-2%	-4%	2%
	Principal Rd	33.9	33.5	32.9	31.0	30.5	30.3	-0.4	-0.6	-1.9	-0.5	-0.2	-1%	-2%	-6%	-2%	-1%
	Average	**46.7**	**43.2**	**42.6**	**41.1**	**39.8**	**40.2**	**-3.6**	**-0.6**	**-1.5**	**-1.3**	**0.5**	**-8%**	**-1%**	**-4%**	**-3%**	**1%**

Table 3.14: A23 southbound summary statistics

Road Type	No. of Links	Link Kms	% Link Kms
Principal Roads	39	21	100%
Total	**39**	**21**	**100%**

Table 3.15: Modelled links on the A217 (N)bound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kms (veh kms)	Principal Rd	21,911	23,776	24,014	25,003	25,416	25,695	1,865	238	989	413	279	9%	1%	4%	2%	1%
	Total	**21,911**	**23,776**	**24,014**	**25,003**	**25,416**	**25,695**	**1,865**	**238**	**989**	**413**	**279**	**9%**	**1%**	**4%**	**2%**	**1%**
Vehicle Hrs (veh hrs)	Principal Rd	447	500	502	534	546	557	53	2	32	12	11	12%	0%	6%	2%	2%
	Total	**447**	**500**	**502**	**534**	**546**	**557**	**53**	**2**	**32**	**12**	**11**	**12%**	**0%**	**6%**	**2%**	**2%**
Avg. Speed (kph)	Principal Rd	49.1	47.5	47.8	46.8	46.6	46.2	-1.6	0.3	-1.0	-0.2	-0.4	-3%	1%	-2%	0%	-1%
	Average	**49.1**	**47.5**	**47.8**	**46.8**	**46.6**	**46.2**	**-1.6**	**0.3**	**-1.0**	**-0.2**	**-0.4**	**-3%**	**1%**	**-2%**	**0%**	**-1%**

Table 3.16: A217 (N)bound summary statistics

Road Type	No. of Links	Link Kms	% Link Kms
Principal Roads	37	20	100%
Total	**37**	**20**	**100%**

Table 3.17: Modelled links on the A217 southbound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kms (veh kms)	Principal Rd	20,188	23,891	23,041	23,749	24,243	24,297	3,703	-850	708	494	54	18%	-4%	3%	2%	0%
	Total	**20,188**	**23,891**	**23,041**	**23,749**	**24,243**	**24,297**	**3,703**	**-850**	**708**	**494**	**54**	**18%**	**-4%**	**3%**	**2%**	**0%**
Vehicle Hrs (veh hrs)	Principal Rd	413	514	485	512	533	535	101	-29	27	21	2	24%	-6%	6%	4%	0%
	Total	**413**	**514**	**485**	**512**	**533**	**535**	**101**	**-29**	**27**	**21**	**2**	**24%**	**-6%**	**6%**	**4%**	**0%**
Avg. Speed (kph)	Principal Rd	48.9	46.5	47.5	46.4	45.5	45.4	-2.4	1.0	-1.1	-0.9	-0.1	-5%	2%	-2%	-2%	0%
	Average	**48.9**	**46.5**	**47.5**	**46.4**	**45.5**	**45.4**	**-2.4**	**1.0**	**-1.1**	**-0.9**	**-0.1**	**-5%**	**2%**	**-2%**	**-2%**	**0%**

Table 3.18: A217 southbound summary statistics

Road Type	No. of Links	Link Kms	% Link Kms
Principal Roads	21	9	100%
Total	**21**	**9**	**100%**

Table 3.19: Modelled links on the A25 eastbound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kms (veh kms)	Principal Rd	4108	4,508	3,737	4,510	4,895	5,012	400	-771	773	385	117	10%	-17%	21%	9%	2%
	Total	**4,108**	**4,508**	**3,737**	**4,510**	**4,895**	**5,012**	**400**	**-771**	**773**	**385**	**117**	**10%**	**-17%**	**21%**	**9%**	**2%**
Vehicle Hrs (veh hrs)	Principal Rd	127	150	114	148	165	169	23	-36	34	17	4	18%	-24%	30%	11%	2%
	Total	**127**	**150**	**114**	**148**	**165**	**169**	**23**	**-36**	**34**	**17**	**4**	**18%**	**-24%**	**30%**	**11%**	**2%**
Avg. Speed (kph)	Principal Rd	32.3	30.0	32.8	30.4	29.7	29.7	-2.3	2.8	-2.4	-0.7	0.0	-7%	9%	-7%	-2%	0%
	Average	**32.3**	**30.0**	**32.8**	**30.4**	**29.7**	**29.7**	**-2.3**	**2.8**	**-2.4**	**-0.7**	**0.0**	**-7%**	**9%**	**-7%**	**-2%**	**0%**

Table 3.20: A25 eastbound summary statistics

Road Type	No. of Links	Link Kms	% Link Kms
Principal Roads	21	8	100%
Total	21	8	100%

Table 3.21: Modelled links on the A25 westbound

Statistic	Road Type	Absolute Values						Absolute Differences					Percentage Differences				
		2009 Base	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Do-Min less 2009	2026 Scen 1a less 2026 Do-Min	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
Vehicle Kms (veh kms)	Principal Rd	4513	5,139	5,649	6,356	6,651	6,787	626	510	707	295	136	14%	10%	13%	5%	2%
	Total	**4,513**	**5,139**	**5,649**	**6,356**	**6,651**	**6,787**	**626**	**510**	**707**	**295**	**136**	**14%**	**10%**	**13%**	**5%**	**2%**
Vehicle Hrs (veh hrs)	Principal Rd	150	189	213	249	264	272	39	24	36	15	8	26%	13%	17%	6%	3%
	Total	**150**	**189**	**213**	**249**	**264**	**272**	**39**	**24**	**36**	**15**	**8**	**26%**	**13%**	**17%**	**6%**	**3%**
Avg. Speed (kph)	Principal Rd	30.1	27.2	26.5	25.5	25.2	25.0	-2.9	-0.7	-1.0	-0.3	-0.2	-10%	-3%	-4%	-1%	-1%
	Average	**30.1**	**27.2**	**26.5**	**25.5**	**25.2**	**25.0**	**-2.9**	**-0.7**	**-1.0**	**-0.3**	**-0.2**	**-10%**	**-3%**	**-4%**	**-1%**	**-1%**

Table 3.22: A25 westbound summary statistics

3.7   Strategic Route Network Analysis

3.7.1   Reigate & Banstead contains part of the M25 and Junction 8 (Reigate Hill). To assess if this part of the SRN is projected to incur adverse traffic impacts as a result of the planned 2026 development in the borough, select link analyses were conducted on the slip roads on and off (clockwise and anti-clockwise) of the M25 junction 8, as well as the mainline carriageway between these on and off slips.

3.7.2   A select link analysis reports the traffic flow on an individual link and highlights the origins and destinations of each trip that travels on that link and provides useful information to assess the changes in traffic flow and distribution of trips that travel through a specific link between different development scenarios.

3.7.3   Select link analyses were conducted on the links of the M25 Junction 8 for 2026 Scenario 1a, 1b, 2 and 3. However, there was no evidence of large variations in the flows or distribution on these links in the 2026 development scenario forecasts. For this reason the select link tables for junction 8 are not included in this report as the results do not illustrate any significant impacts.

3.7.4   However, Table 3.23 summarises the flows, and differences in flows, for all links at the M25 Junction 8 (Reigate Hill) Interchange for all 2026 development scenarios.

Link	Flow (pcu/hr)				Absolute Difference			Percentage Difference		
	2026 Scen. 1a	2026 Scen. 1b	2026 Scen. 2	2026 Scen. 3	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2	2026 Scen 1b less 2026 Scen 1a	2026 Scen 2 less 2026 Scen 1b	2026 Scen 3 less 2026 Scen 2
M25 J8 Slip On CW	1,241	1,176	1,097	1,141	-65	-79	44	-5%	-7%	4%
M25 J8 Slip Off CW	1,315	1,309	1,293	1,334	-7	-16	41	-1%	-1%	3%
M25 J8 Slip On AC	1,079	999	1,029	1,041	-80	30	12	-7%	3%	1%
M25 J8 Slip Off AC	790	690	687	679	-100	-3	-8	-13%	0%	-1%
M25 J8 Mainline CW	4,843	4,934	5,026	4,999	91	92	-28	2%	2%	-1%
M25 J8 Mainline AC	4,806	4,913	4,941	4,951	107	27	11	2%	1%	0%

Table 3.23: M25 Junction 8 Reigate Hill Interchange modelled flows

3.8   Merge/Diverge Assessment of the SRN

3.8.1   A simple highway capacity assessment was undertaken on the merge and diverge lanes of the M25 junction 8 Reigate Hill Interchange. The assessment followed guidelines set out in the Design Manual for Roads and Bridges (DMRB) using the modelled flows for the 2009 base, 2026 Do-Minimum and all 2026 development scenario scenarios.

3.8.2   The DMRB Volume 6 (Road Geometry) Section 2 (Junctions) was used in conjunction with the modelled traffic flows for the mainline carriageway and slips on and off at junction 8, to determine the junction merge/diverge configuration required to accommodate the forecast traffic flows as a result of the different future development scenarios.

3.8.3   Table 3.24 displays the type of merge/diverge configuration that have been determined according to the modelled traffic flows and the DMRB guidelines for the M25 junction 8. All junction layouts were identified with reference to the motorway merge/diverge

graphs and junction diagrams shown in the DMRB (see *Appendix A*). *Appendix B* shows diagrammatic interpretations of details in Table 3.24 for all modelled scenarios and the existing layout. The existing layout was obtained by use of aerial photographs.

3.8.4   The key for *Table 3.22* is as follows:

Merge   Diverge
A = Taper merge   A = Taper diverge
B = Parallel merge   C = Lane drop at taper diverge
C = Ghost island merge   D, 2 = Lane drop at parallel diverge
E = Lane gain

Link	Junction Type	Existing Layout	2009	2026 Do-Min	2026 Scen 1a	2026 Scen 1b	2026 Scen 2	2026 Scen 3	Comment (Existing to Scenario 2 or 3)
M25 J8 Slip Off AC	Diverge	C	C	C	A	A	C	C	Constant
M25 J8 Slip On AC	Merge	C	E	E	E	E	E	E	Additional Capacity
M25 J8 Slip Off CW	Diverge	D,2	C	C	C	C	C	C	Spare Capacity
M25 J8 Slip On CW	Merge	A	B	E	E	E	E	E	Additional Capacity

Table 3.24: M25 Junction 8 Reigate Hill Interchange assessment of merge/diverge layouts

3.8.5   Table 3.24 indicates whether the junctions have spare capacity, require additional capacity or the capacity requirements remain constant, based on the differences between the existing and 2026 Scenario 3 layout.

3.8.6   Table 3.24 indicates that both the diverge junctions at the M25 junction 8 have spare capacity or do not require any additional capacity. However, both of the merge junctions may require additional capacity. The modelled flows used in the assessment and the results suggest that the merge configurations may need upgrading to accommodate the estimated traffic growth projected to occur between the current situation and the 2026 Do-Minimum. The guidance suggests that the existing merge configuration for the 'on-slip' anti-clockwise is upgraded from a ghost island merge to a lane gain, whilst the merge configuration for the 'on-slip' clockwise is upgraded from a taper merge to a parallel merge. However, it should be noted that the M25 slip-on merge anticlockwise is currently controlled by 'Ramp Metering, which is not explicitly modelled, which may reduce the need for any future capacity enhancements.

3.8.7   In summary the merge/diverge SRN assessment indicates that by the forecast year of 2026 (i.e. 2026 Do-Minimum) the theoretical operational capacity for the 'on slips' at M25 junction 8 (Reigate Hill) will have been obtained and therefore it is likely that further measures will be required to manage the additional flow onto the motorway at this junction. It is suggested that further feasibility work using a more rigorous assessment should be undertaken to substantiate these findings and help inform any potential transport measures required to manage and support the operation of the junction as a result of future development.

4   CONCLUSIONS

4.1   Summary

4.1.1   The transport assessment for Reigate & Banstead aims to consider the cumulative traffic impacts of future development as proposed in the emerging Core Strategy of the LDF for RBBC. The assessment was based on committed and planned development to occur in the borough between the base year of 2009 and a forecast year of 2026. The study assists with assessing the sensitivity of both the LRN and SRN to the additional highway traffic generated by the proposed future development.

4.1.2   The assessment was undertaken by utilising the SCC's County strategic transport model, SINTRAM; in the average AM peak hour (0700 – 1000).

4.1.3   The main objectives of the study were:

- Identify the size and locations of additional commercial and residential development in the borough of Reigate & Banstead;
- Calculate the distribution of vehicle trips resulting from the additional development;
- To forecast the traffic impacts of development on the LRN and SRN;
- Act as a starting point for identifying the locations for further study and mitigation measures;
- Report the main traffic impacts on both the LRN and SRN.

4.1.4   2026 trip generation forecasts within the borough were derived from planning data obtained from RBBC and the use of the TRICS database. The trip generation for the AM average hour derived from these sources were then incorporated in the trip matrices of the SINTRAM strategic model, creating 2026 forecast scenario demand matrices.

4.1.5   The modelling of these forecast scenarios has enabled broad comparisons to be made between these forecasts and the base year. The main focus of this report is the likely impacts generated from each scenario compared to a suitable reference case, but specifically to assess the impacts of two proposed future development strategies i.e. scenarios 2 and 3 .

4.2   Traffic Impacts of Development

4.2.1   All projected traffic impacts suggested and indicated in this assessment concentrate on the borough of Reigate & Banstead. Therefore the assessment is focussed on the projected amount of additional trips generated from the committed and planned development in the borough between 2009 and 2026.

4.2.2   The assessment includes four development scenario forecast scenarios, based on the likelihood of developments occurring in the borough. Scenario 1a is based on committed developments; scenario 1b is based on the previous scenario as well as high likelihood sites from SHLAA, retail/employment and regeneration studies; scenario 2 is based on the previous scenario as well as broad developments identified in the SHLAA, retail/employment and regeneration studies; and scenario 3 is based on the previous scenario as well as urban extension on areas of sustainable greenbelt land.

4.2.3   A summary of the travel matrix that illustrates growth in traffic in the borough for the 2009 base year, 2026 Do-Minimum reference and 2026 Development scenario matrices are displayed in Table 4.1 and Figure 4.1.

Vehicle Trips	2009 Base	2026 Do-Minimum	2026 Scenario 1a	2026 Scenario 1b	2026 Scenario 2	2026 Scenario 3
RBBC Intra Borough Trips	12,795	20,668	21,223	23,102	24,148	24,553
External to Borough Trips	9,919	10,817	10,881	11,232	11,474	11,524
Borough to External Trips	7,898	8,133	8,336	8,856	9,136	9,262

Table 4.1:Summary of trips in the borough for average AM peak period (0700 – 1000)
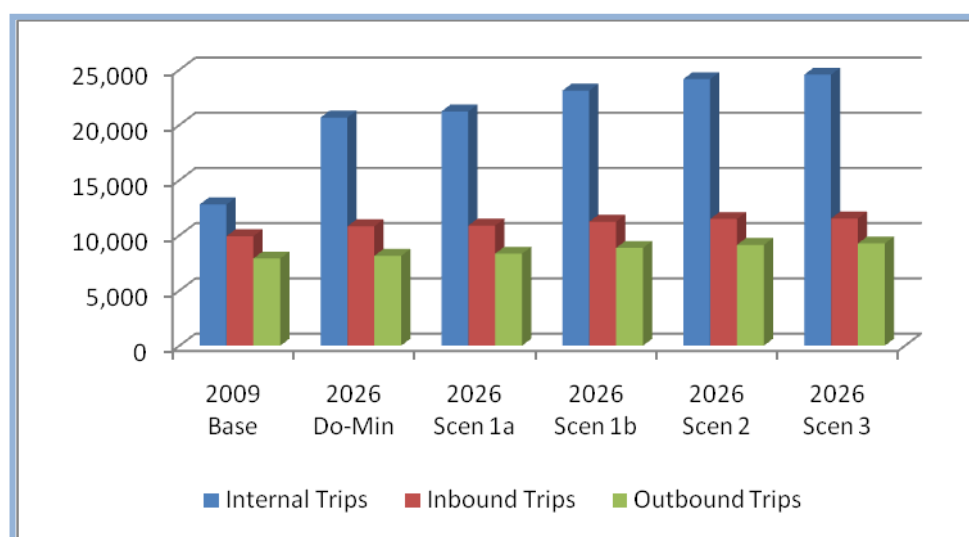
Figure 4.1:Summary of trips in the borough for average AM peak period (0700 – 1000)

4.2.4   Table 4.1 and Figure 4.1 illustrate that most of the traffic growth occurs from trips both starting and finishing journeys within the borough

4.2.5   By comparing network summary statistics and plots of traffic flows it is projected that 2026 scenario 3 has the greatest isolated impacts on the LRN and SRN traffic flows in the borough of Reigate & Banstead which is to be expected as the scenario also contains the most development.

4.2.6   However, the differences between the traffic impacts suggested to occur in scenario 2 and scenario 3 is minimal and therefore scenario 2 has similar levels of impacts. For example the difference in total vehicle kilometres travelled between scenario 2 and 3 only differed by 0.6%, a 1.1% difference in total vehicle hours and the total average speed travelled on links in the borough remained constant. This is because the additional trips generated in scenario 3 are isolated to only four modelled zones so the impacts indicated in scenario 3 are relatively localised.

4.3   Local Road Network Findings

4.3.1   Due to the impacts between scenario 2 and scenario 3 being minimal, as well as scenario 3 being less certain than scenario 2, it was thought best to base the conclusions of the assessment on the proposed traffic impacts generated from scenario 2.

4.3.2 Borough roads most sensitive to increases in additional traffic and other associated impacts such as congestion and increased journey times between scenario 2 (when compared to scenario 1b), are located in close proximity to the development areas identified to support the greatest amount of additional development and hence incur the greatest amount of additional trips. For instance zone 163 (Redhill – Holmethorpe East) is proposed to incur the greatest amount of additional origin trips and as a result roads within this zone experience the greatest impacts, specifically the A25 Nutfield Road. Several road corridors have been identified as particularly sensitive to the additional traffic generated by the future development, these corridors include:

- A217 London Rd (Reigate Town Centre)
- A23 London Rd (N) & (S) (Redhill to Merstham);
- A23 Marketfield Way (South of Redhill Town Centre)
- A23 Brighton Rd (Redhill Town Centre)
- A23 Brighton Rd (Salfords)
- C224 Linkfield Lane
- Horley Row (Meath Green\ Horley)

4.3.3 Within these corridors some 'key' junctions are also sensitive to additional traffic flow and hence increased junction delay. Some of the junctions forecast to experience the greatest increases in junction delay between scenario 1b and scenario 2, occur along the A23 corridor between Redhill and Merstham and the A217 corridor between Reigate and Burgh Heath, including:

- A23 London Rd, Frenches Rd, Linkfield Ln
- A25 Queens Way, A23 London Road, A23 Princess Way
- Linkfield Ln, Gloucester Rd
- A23 Princess Way, A25 Redstone Hill, A23 Marketfield Way
- A23 Marketfield Way, A23 Brighton Rd, A23 High St
- Linkfield Ln, A25 Station Rd, A25 Hatchlands Rd
- A25 Hatchlands Rd, Fangates Rd

4.3.4 When considering the additional traffic impacts on congestion levels within the borough, there is little evidence to suggest that this increases by any significant amount in the 2026 development scenario forecast scenarios. However, there are several road corridors which appear to suffer the constant effects of congestion within all of the development scenarios, these being:

- A217 Cockshot Hill/Reigate Hill and A25 West St – Reigate;
- A23 London Rd North/London Rd South – Redhill/Merstham;
- A23 Brighton Rd/B2036 Balcombe Rd – Horley.

4.3.5 Overall the assessment suggests that some 'improvements' will be required to mitigate against the impacts of background growth and committed development between now and 2026, and that that further 'improvements' will also be required to mitigate the impacts at the specific locations mentioned above if development scenarios 1b or 2 where implemented . Scenario 3 had minimal impacts compared against scenario 2.

4.4   Strategic Route Network Findings

4.4.1   The M25 junction 8 Reigate Hill interchange is located within the borough including a small section of the M25, the M23 runs parallel to the eastern boundary, but is external to the borough.

4.4.2   In relation to the SRN, any traffic impacts caused by the additional traffic generated from the boroughs planned development appear fairly minimal. Since the traffic flows and levels of congestion projected on the M25 junction 8 and associated carriageway only show relatively minor differences when comparing the various 2026 development scenarios.

4.4.3   A simple highway capacity assessment was conducted on the M25 junction merge and diverges. This assessment made use of the DMRB guidelines of junction layout according to the upstream/downstream and merge/diverge flows. The modelled flows used in the assessment and the results suggest that the merge configurations may need upgrading to accommodate the estimated traffic growth projected to occur between the current situation and the 2026 Do-Minimum. The 2026 Do-Minimum refers to the 2026 'full' traffic growth for the entire country and background growth for the borough. However, the assessment also reveals that no further upgrades in merge/diverge configuration would be required to accommodate the estimated traffic growth between the 2026 Do-Minimum and 2026 development scenario forecasts, assuming that the required upgrade was implemented.

4.5   Limitations of Study

4.5.1   Given the strategic nature of the model and using data based on local planning estimates from Reigate and Banstead's emerging Core Strategy. There are a number of limitations which need to be considered during the preparation and interpretation of the highway capacity impacts on both the SRN and LRN within this report which are set out below.

4.5.2   The limitations of the planning estimates produced in August 2011 (and the uncertainty of the size, distribution and land-use of any future planned developments) the interpretation of the likely impacts on both the SRN and LRN within this assessment should be treated as broad strategic projections, and as such further work would be recommended, (including complementary analysis using appropriate modelling \ assessment tools), to further assist in the identification of additional infrastructure needs and other potential mitigation measures at a more local and detailed level.

4.5.3   This transport assessment is 'a tool' for incrementally assessing the cumulative traffic impacts generated from future committed and planned development proposals in the borough of Reigate & Banstead. The cumulative borough-wide transport assessment also assumes that all development would occur simultaneously and that any impacts described in this report do not account for any possible mitigation, demand management or infrastructure provision and effectively present a worse case situation.

PART B

5   MODEL DESCRIPTION AND VALIDATION

5.1   Context

5.1.1   The County model (SINTRAM60_R&B_111017) was used to evaluate the development proposals. This is a strategic model that encapsulates the road network of Surrey and surrounding local authorities; at a national level the model incorporates all strategic roads within Great Britain.

5.1.2   All motorways, A and B roads together with some local roads are explicitly modelled within SINTRAM. Where traffic junctions and traffic signals are likely to have significant effects, the details of their general layout or timing of the signals are also included in the modelling. However, strategic modelling uses aggregate descriptions of traffic such as flow, density and speed, and the relationships between them and hence does not include every road or junction. As a result the model is unable to answer detailed questions regarding traffic interactions, such as queuing and individual driver behaviour. It can, however, provide approximate answers to a wide range of transport problems (i.e. re-distribution effects), making it a reasonable tool for the initial assessment for the boroughs LDF and any potential impacts that arise from this.

5.2   Vehicle Types

5.2.1   Cars, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) are separately represented in the model. Trips by public transport are not modelled.

5.3   Time Period

5.3.1   The assessment was performed in the average AM peak hour (the average hour of 0700 – 1000 hours).

5.4   Assignment Method

5.4.1   A fixed matrix equilibrium assignment was performed for 80 iterations using the Method of Successive Averages (MSA). This is an assignment using user equilibrium with optional Burrell type perturbations. The assignment allocates given travel demand (a set of trips with fixed origins and destinations) on the modelled network in order to obtain distribution of traffic flow. The resulting traffic flow represents the *'average'* conditions for the time period under study. The assignment was performed for 80 iterations using a spread factor of 0.5 for all modelled scenarios in this study.

5.5   Zoning System

5.5.1   SINTRAM makes use of a zoning system. Zones within Surrey are based on the national census output areas, whereas zones external to the County cover larger areas and are generally less refined in comparison (a result of being located outside the models key study area, Surrey). The borough of Reigate & Banstead was split into 35 modelled zones to which the planning data was allocated.

5.5.2   *Figures 5.1* and *5.2* show the modelled zone plans for the borough of Reigate & Banstead.
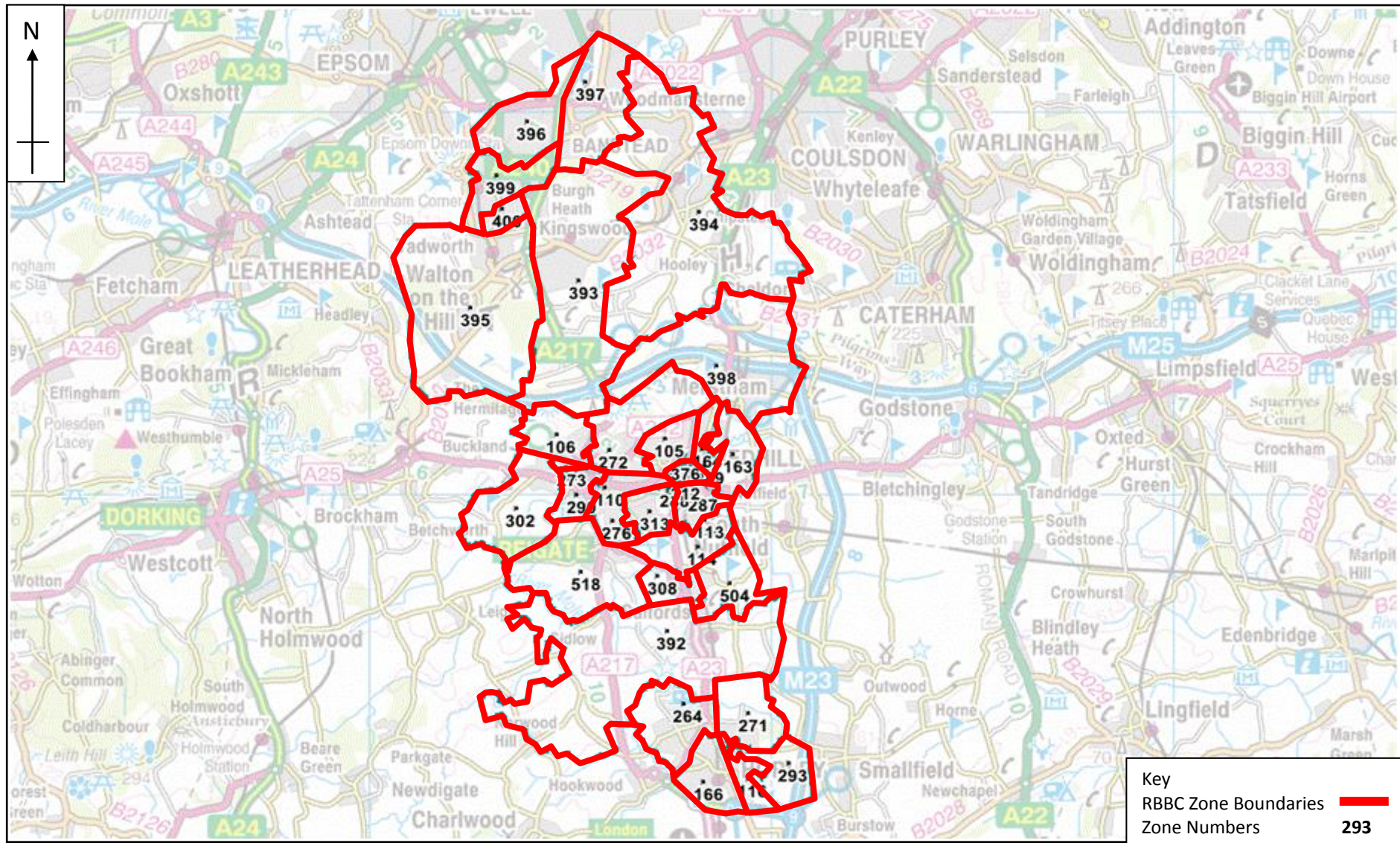
Figure 5.1: Reigate & Banstead borough modelled zone plan
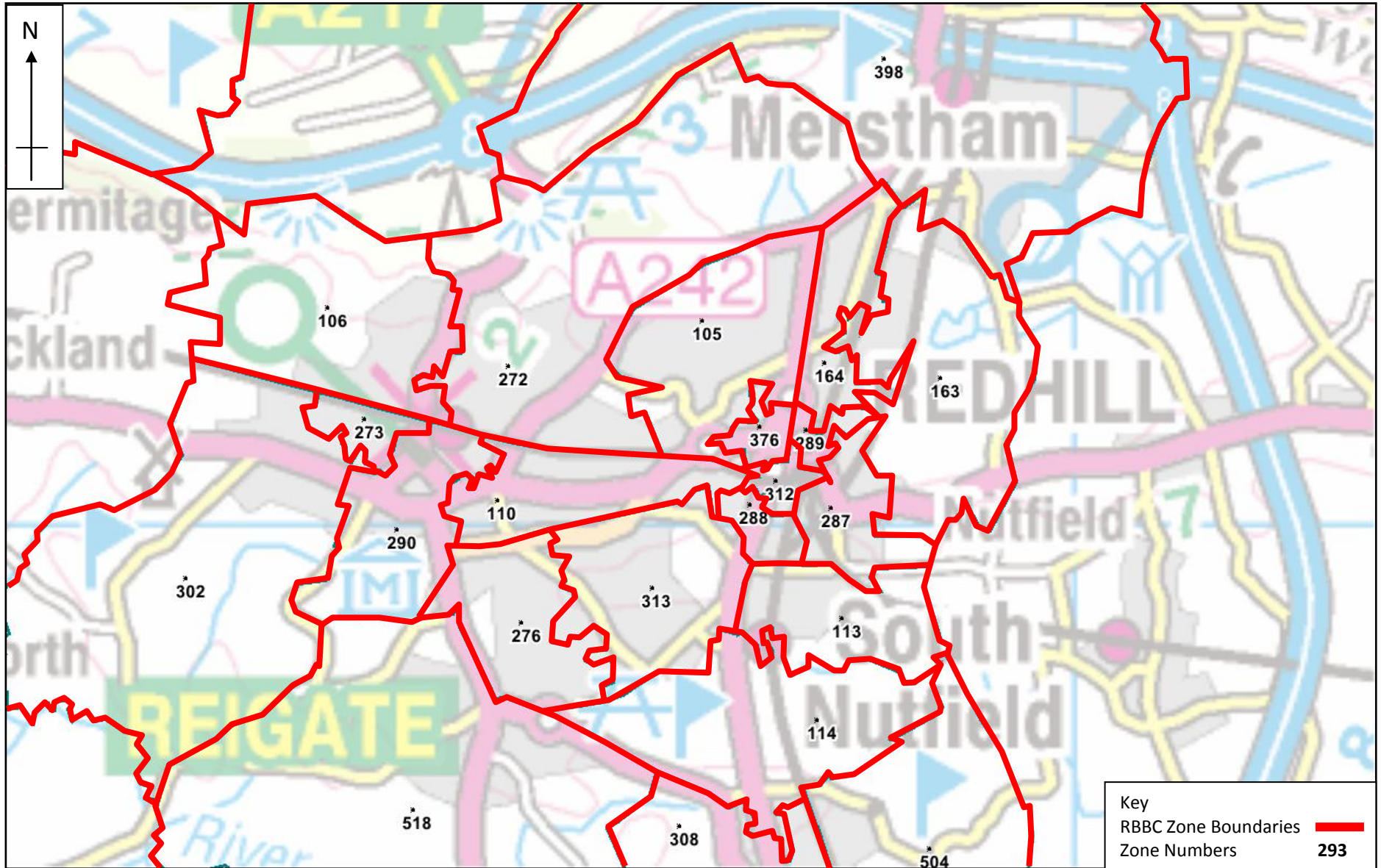
Figure 5.2: Reigate & Banstead borough modelled zone plan, focused on Reigate & Redhill town centres

5.6   Model Validation

5.6.1   SINTRAM is already validated within Surrey to the modelled base year of 2009. However, it was felt necessary to ensure the study area contained modelled flows that were as representative as possible. Hence the SINTRAM model was re-validated in the area of Reigate & Banstead in isolation, purely for the purpose of this study.

5.6.2   To ensure a high level of validation in the study area of this assessment, it was necessary to audit as well as extend the modelled highway network and validate the modelled flows to the observed flows on the highway network using available count data.

5.7   Network Audit and Extension

5.7.1   A network audit was completed on the existing modelled highway network in the borough of Reigate & Banstead. The network audit included the checking and correcting of the following:

- Link types;
- Road names and numbers;
- Junction geometry and where applicable signal settings;
- Zone names and assignment to correct borough and region.

5.7.2   The network was extended in more rural parts of the borough i.e. South Nutfield and neighbouring areas further to the east by including a larger number of unclassified roads and junctions where necessary. Inclusion of extra roads in the network enables the assigned traffic routing to become more realistic and thus giving a higher level of validation.

5.8   Count Data

5.8.1   SINTRAM already contained a number of 2009 counts in the borough of Reigate & Banstead, but the count data was enhanced by adding multiple new counts to the study area with the aim of improving the level of flow validation in the 2009 base.

5.8.2   Count data for the LRN within Reigate & Banstead was obtained from SCC's Transport Studies Team's survey database for the year 2009, where possible. Where data for 2009 was not available the most next appropriate year was sourced, generally a neighbouring year i.e. 2008 and 2010.

5.8.3   Count data for surrounding SRN, the M25 and M23, was obtained from the HA's Traffic Information Database (TRADS). Observed flows for the SRN were extracted from TRADS for 2009 and a neutral month where possible. If such data was not available then the next most appropriate year or month was used.

5.9   Assignment Validation

5.9.1   The modelled flows were validated to observed counts in the study area by the process of matrix estimation.

5.9.2   The counts used to validate the modelled flows were sourced from both SCC and the HA's TRADS database, but are all relevant to the modelled base year of 2009. In total 107 counts were used in the matrix estimation process and these 107 counts were evenly spread across the borough and located on varying road classification.

5.9.3   The matrix estimation used in the validation process was performed for 80 assignment iterations and five matrix estimation iterations. Matrix estimation was performed for each modelled vehicle type (Cars, LGVs and HGVs).

5.9.4   The validation of the modelled average hour was undertaken based on the assignment validation acceptability guidelines presented in *DMRB Volume 12, Section 2, Part 1: Traffic Appraisal in Urban Areas*." A simplified version of DMRB's Table 4.2 is produced below in Table 5.1, showing the various levels of validation required for various flow groups.

Criteria and Measure	Acceptability Guideline
Individual flows ± 15% for flows between 700 and 2,700 vph	
Individual flows ±100 vph for flows < 700 vph	> 85% of cases
Individual flows ± 400 vph for flows > 2,700 vph	
GEH statistic < 5 for individual flows	> 85% of cases

Table 5.1: DMRB criteria measures for modelled vs observed hourly flows

5.9.5   A summary of the validation results achieved for this study are as follows (based on the 107 used in the validation process):

- 84% of counts have a GEH less than 5.5;
- 86% of flows within the DMRB assignment validation acceptability guidelines;
- Average GEH (of the 107 counts) is 3.1;
- Three of the 107 counts have a GEH greater than 10;
- r^2 value of 0.989.

5.9.6   Figure 5.3 shows the correlation between the modelled and observed flows and Table 5.2 shows the validation for all counts involved in the matrix estimation process. An **r^2** value greater than 0.95 indicates that the modelled traffic flows reflect observed traffic flows well.
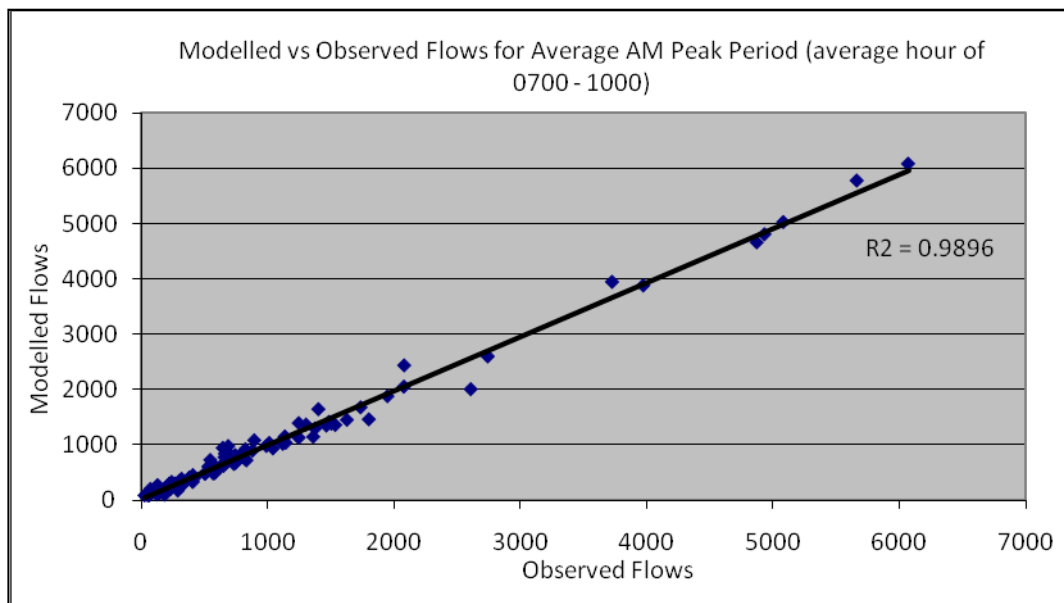
Figure 5.3: Graph showing the correlation between modelled and observed flows

Link Name	Obs. Flow (All Vehicles)	Model Flow (All Vehicles)	GEH	Obs < 700vph & Model ± 100vph	Obs 700 to 2,700vph & Model ± 15%	Obs > 2,700vph & Model < 400vph	GEH <5.5	GEH > 10
A2022 Croydon Ln	749	771	0.79	✘	✔	✘	✔	✘
A2022 Croydon Ln	809	852	1.48	✘	✔	✘	✔	✘
A2044 Woodhatch Rd	660	768	4.04	✘	✘	✘	✔	✘
A2044 Woodhatch Rd	671	669	0.09	✔	✘	✘	✔	✘
A217 Bell St	833	714	4.28	✘	✔	✘	✔	✘
A217 Bell St	675	676	0.04	✔	✘	✘	✔	✘
A217 Brighton Rd	1737	1670	1.63	✘	✔	✘	✔	✘
A217 Brighton Rd	1537	1352	4.87	✘	✔	✘	✔	✘
A217 Brighton Rd	1802	1454	8.62	✘	✘	✘	✘	✘
A217 Brighton Rd	1377	1288	2.43	✘	✔	✘	✔	✘
A217 Brighton Rd	1362	1138	6.34	✘	✘	✘	✘	✘
A217 Brighton Rd	1134	1129	0.15	✘	✔	✘	✔	✘
A217 Cockshot Hill	820	742	2.79	✘	✔	✘	✔	✘
A217 Cockshot Hill	547	719	6.85	✘	✘	✘	✘	✘
A217 Reigate Hill	744	808	2.31	✘	✔	✘	✔	✘
A217 Reigate Hill	895	1075	5.74	✘	✘	✘	✘	✘
A217 Reigate Hill	1247	1121	3.65	✘	✔	✘	✔	✘
A217 Reigate Hill	991	972	0.61	✘	✔	✘	✔	✘
A217 Reigate Hill	734	648	3.26	✘	✔	✘	✔	✘
A217 Reigate Hill	742	679	2.36	✘	✔	✘	✔	✘
A23 Bonehurst Rd	1138	1143	0.16	✘	✔	✘	✔	✘
A23 Bonehurst Rd	825	914	3.00	✘	✔	✘	✔	✘
A23 Brighton Rd	569	477	4.00	✔	✘	✘	✔	✘
A23 Brighton Rd	619	580	1.57	✔	✘	✘	✔	✘
A23 Brighton Rd	803	812	0.32	✘	✔	✘	✔	✘
A23 Brighton Rd	637	619	0.72	✔	✘	✘	✔	✘
A23 Brighton Rd	753	739	0.51	✘	✔	✘	✔	✘
A23 Brighton Rd	663	834	6.25	✘	✘	✘	✘	✘
A23 Brighton Rd	1014	1026	0.36	✘	✔	✘	✔	✘
A23 Brighton Rd	703	820	4.25	✘	✘	✘	✔	✘
A23 Brighton Rd	1247	1385	3.81	✘	✔	✘	✔	✘
A23 Brighton Rd	1487	1407	2.09	✘	✔	✘	✔	✘
A23 Brighton Rd	1305	1359	1.48	✘	✔	✘	✔	✘
A23 Brighton Rd	1629	1445	4.71	✘	✔	✘	✔	✘
A23 Brighton Rd	1949	1871	1.77	✘	✔	✘	✔	✘
A23 Brighton Rd	1506	1376	3.43	✘	✔	✘	✔	✘
A23 London Rd	718	747	1.06	✘	✔	✘	✔	✘
A23 London Rd	1121	1011	3.36	✘	✔	✘	✔	✘
A23 London Rd	775	786	0.40	✘	✔	✘	✔	✘
A23 London Rd	881	890	0.31	✘	✔	✘	✔	✘
A23 London Rd	547	575	1.17	✔	✘	✘	✔	✘
A23 London Rd	582	612	1.22	✔	✘	✘	✔	✘
A240 Reigate Rd	582	483	4.30	✔	✘	✘	✔	✘
A240 Reigate Rd	569	603	1.40	✔	✘	✘	✔	✘
A242 Croydon Rd	409	446	1.80	✔	✘	✘	✔	✘
A242 Croydon Rd	503	476	1.23	✔	✘	✘	✔	✘
A25 Church St	747	691	2.11	✘	✔	✘	✔	✘
A25 High St	1466	1341	3.35	✘	✔	✘	✔	✘
A25 Redstone Hill	382	402	1.00	✔	✘	✘	✔	✘
A25 Redstone Hill	587	552	1.47	✔	✘	✘	✔	✘
B2032 Dorking Rd	748	668	3.01	✘	✔	✘	✔	✘
B2032 Dorking Rd	538	592	2.27	✔	✘	✘	✔	✘
B2032 Outwood Ln	241	264	1.43	✔	✘	✘	✔	✘
B2032 Outwood Ln	368	362	0.32	✔	✘	✘	✔	✘

Link Name	Obs. Flow (All Vehicles)	Model Flow (All Vehicles)	GEH	Obs < 700vph & Model ± 100vph	Obs 700 to 2,700vph & Model ± 15%	Obs > 2,700vph & Model < 400vph	GEH <5.5	GEH > 10
B2032 Outwood Ln	125	96	2.72	✓	✗	✗	✓	✗
B2032 Outwood Ln	265	293	1.69	✓	✗	✗	✓	✗
B2032 Pebble Hill Rd	730	766	1.32	✗	✓	✗	✓	✗
B2032 Pebble Hill Rd	652	611	1.63	✓	✗	✗	✓	✗
B2033 Headley Common Rd	408	323	4.45	✓	✗	✗	✓	✗
B2033 Headley Common Rd	273	244	1.82	✓	✗	✗	✓	✗
B2034 Blackborough Rd	263	273	0.64	✓	✗	✗	✓	✗
B2034 Blackborough Rd	139	222	6.20	✓	✗	✗	✗	✗
B2036 Balcombe Rd	646	937	10.35	✗	✗	✗	✗	✓
B2036 Balcombe Rd	507	473	1.53	✓	✗	✗	✓	✗
B2218 Sutton Ln	300	272	1.67	✓	✗	✗	✓	✗
B2218 Sutton Ln	421	395	1.30	✓	✗	✗	✓	✗
B2220 Chequers Ln	73	196	10.62	✗	✗	✗	✗	✓
B2220 Chequers Ln	62	120	6.11	✓	✗	✗	✗	✗
B2221 Great Tattenhams	320	379	3.18	✓	✗	✗	✓	✗
B2221 Great Tattenhams	317	259	3.42	✓	✗	✗	✓	✗
B284 Yew Tree Bottom Rd	241	323	4.91	✓	✗	✗	✓	✗
B284 Yew Tree Bottom Rd	306	350	2.44	✓	✗	✗	✓	✗
Consort Way East	141	113	2.48	✓	✗	✗	✓	✗
Consort Way East	77	121	4.45	✓	✗	✗	✓	✗
Dean Ln	52	81	3.57	✓	✗	✗	✓	✗
Dean Ln	137	145	0.66	✓	✗	✗	✓	✗
Gatton Bottom	315	304	0.62	✓	✗	✗	✓	✗
Gatton Bottom	241	249	0.54	✓	✗	✗	✓	✗
Lonesome Lane	70	105	3.78	✓	✗	✗	✓	✗
Lonesome Lane	64	80	1.86	✓	✗	✗	✓	✗
Pendleton Rd	533	601	2.87	✓	✗	✗	✓	✗
Pendleton Rd	226	285	3.70	✓	✗	✗	✓	✗
Philanthropic Rd	96	145	4.45	✓	✗	✗	✓	✗
Philanthropic Rd	27	79	7.17	✓	✗	✗	✗	✗
Russells Crescent	235	198	2.52	✓	✗	✗	✓	✗
Russells Crescent	130	265	9.61	✗	✗	✗	✗	✗
Victoria Rd	222	290	4.25	✓	✗	✗	✓	✗
Victoria Rd	185	92	7.91	✓	✗	✗	✗	✗
Wray Ln	307	220	5.33	✓	✗	✗	✓	✗
M23 J9 - 9a	2609	1998	12.72	✗	✗	✗	✗	✓
M23 J9a - 9	1403	1637	6.00	✗	✗	✗	✗	✗
M23 Link from J8 N to M25 J7 S	2080	2044	0.79	✗	✓	✗	✓	✗
M23 Link from J8 S to M25 J7 N	289	167	8.10	✗	✗	✗	✗	✗
M23 NB J8 - 7	1043	930	3.59	✗	✓	✗	✓	✗
M23 SB J7 - 8	1144	1030	3.46	✗	✓	✗	✓	✗
M25 AC J8 - 7	5084	5019	0.91	✗	✗	✓	✓	✗
M25 AC J9 - 8	4873	4651	3.21	✗	✗	✓	✓	✗
M25 CW J7 - 8	6072	6072	0.01	✗	✗	✓	✓	✗
M25 CW J8-9	5665	5768	1.37	✗	✗	✓	✓	✗
M25 J7 Slip Off N to M23 J8 N	179	175	0.29	✓	✗	✗	✓	✗
M25 J7 Slip Off SB	2082	2429	7.31	✗	✗	✗	✗	✗
M25 J7 within the junction N	3728	3938	3.39	✗	✗	✓	✓	✗
M25 J7 within the junction S	2744	2590	2.98	✗	✗	✓	✓	✗
M25 J8 Slip Off SB	753	777	0.88	✗	✓	✗	✓	✗
M25 J8 Slip On NB	689	970	9.77	✗	✗	✗	✗	✗
M25 J8 within the junction NB	4934	4798	1.95	✗	✗	✓	✓	✗
M25 J8 within the junction SB	3975	3874	1.61	✗	✗	✓	✓	✗

Table 5.2: Assignment validation based on the DMRB acceptability guidelines

5.10   Counts vs. Flow Bandwidth Plots

5.10.1 A visual aid for assessing differences between modelled flows and observed counts for the 2009 base is a count versus flow bandwidth plot. Figure 5.4 displays the bandwidth flows within the study area for the 2009 base year. Where a bandwidth is coloured green in the centre, this indicates that a count is present on the modelled link. Where these green bands are showing a yellow edge, the modelled flow is less when compared to the observed. Where these green bands show a blue edge, the modelled flow is greater than the observed count.

5.10.2 The bandwidths are proportional to the flow on the modelled link and so too are the blue and yellow edges (the width of the yellow and blue is proportional to the amount of flow the model is over or under estimating by).

5.10.3 It is important to note that where a band is entirely coloured blue, a count is not present on the modelled link and hence, the model assumes it is over-estimating by the entire flow on the link, as it has nothing to compare to.
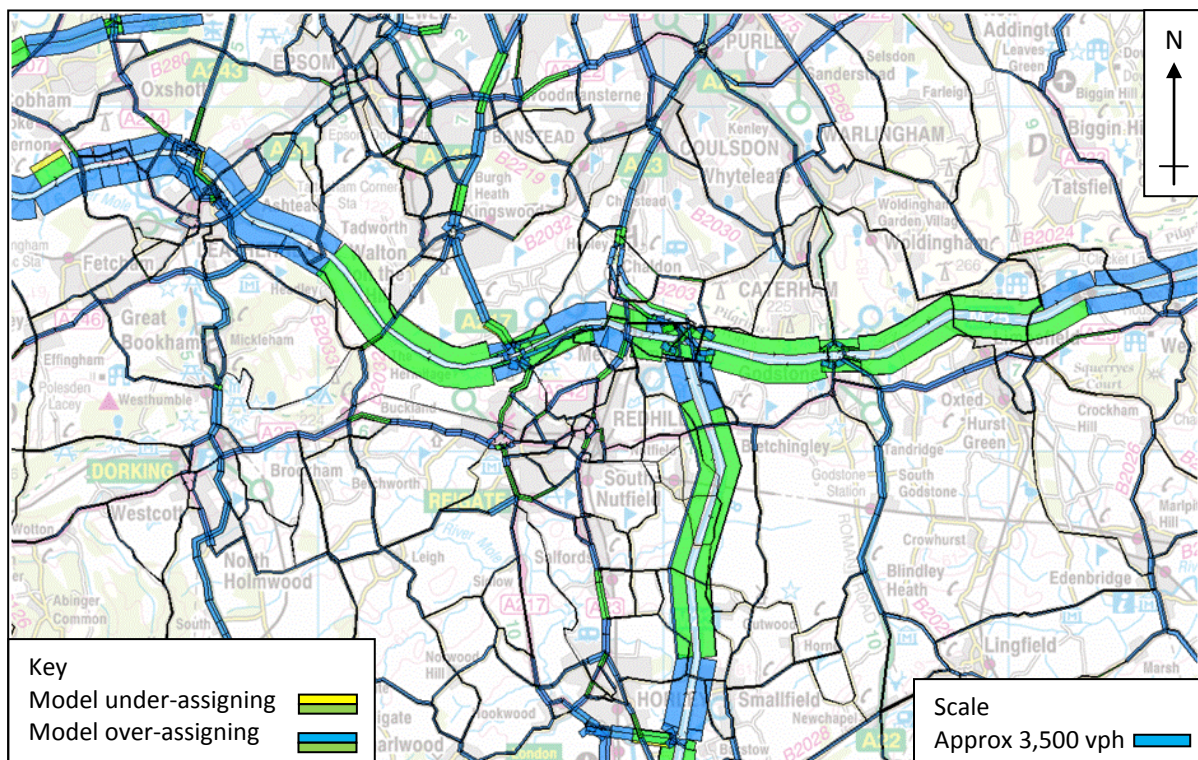
Figure 5.4: 2009 counts vs flows bandwidth plot for Reigate & Banstead study area

6   TRIP RATE ESTIMATES FOR INDIVIDUAL SITES

6.1   Data and Scenarios

6.1.1   Data concerning the committed and planned commercial and residential developments from 2009 to 2026 in the borough of Reigate & Banstead was presented to SCC Transport Studies Team. The data was received in the form of the Transport Studies Team completed pro-forma.

6.1.2   The planning data contained two key categories of development: commercial and residential and reflects the estimated development to occur between 2009 and 2026. Further details of whether each development had committed or planned planning permission was also included. Status of planning permission affects the implications of developments because it is not possible to influence the developments that have already received planning permission.

6.1.3   It was agreed by SCC and RBBC to test four scenarios that are gradually aggregated to give an overall cumulative scenario, as displayed below:

- Scenario 1a = Scenario 1a only
- Scenario 1b = Scenario 1a + Scenario 1b
- Scenario 2 = Scenario 1a + Scenario 1b + Scenario 2
- Scenario 3 = Scenario 1a + Scenario 1b + Scenario 2 + Scenario 3

6.1.4   In a document produced by RBBC ("*Transport Impact Modelling: RBBC transport modelling development scenarios for the RBBC Infrastructure Delivery Plan (IDP),*" August 2011), Scenarios 1b, 2 and 3 are described as "*These scenarios respectively represent a cautious case, a high case, and an additional floating case or urban extension sites*." Below is a brief description of the data involved in each individual scenario input see Table 6.1 (for more detail refer to para 2.4.5 and Table 2.1).

Scenario	Description
Scenario 1a	All current "commitments" since 2009.
Scenario 1b (Cautious trajectory)	High-likelihood Strategic Housing Land Availability Assessment (SHLAA) sites High-likelihood employment sites High-likelihood retail sites High-likelihood regeneration sites Critical items from Infrastructure Delivery Plan (IDP)
Scenario 2 (High trajectory)	Small windfall sites SHLAA broad areas All employment sites All retail sites Regeneration schemes Important items from the IDP
Scenario 3 (Urban Extension)	Sustainable urban extensions

Table 6.1: Summary of development scenarios

6.1.5   This planning data combined with the TRICS database can be used to calculate the proposed amount of additional trips to be generated from individual existing and

proposed developments, and then aggregated to provide the total amount of additional trips generated from a modelled zone in SINTRAM.

6.2 TRICS Methodology

6.2.1 Development trip rates have been obtained from the TRICS database 2010 (a) V6.5.1 Dec 2009. Correspondence between SCC and TRICS showed that a minimal amount of surveys conducted in Surrey were incorporated in the latest version of the software, and these were utilised where necessary. A trip rate refers to the amount of trips generated by a development. These include both trips that arrive and depart from a development.

6.2.2 The TRICS database stores information recorded from past surveys completed in the UK for a range of locations and land uses, counting the number of vehicular trips made to and from individual sites. The TRICS database allows users to select sites that are relevant and similar criteria to a site in question. This enables the estimation of trip rates to and from proposed developments based on past surveyed sites.

6.2.3 It should be noted that the TRICS database is a subjective tool. This is because personal choice and judgement plays a key role in decision making when choosing appropriate sites to compare with the existing and proposed developments.

6.2.4 TRICS Good Practice Guide.2011 was followed for the interrogation of the database to determine comparative sites.

6.2.5 Trip rates produced from the TRICS database were calculated as a trip rate estimate per 100m² gross floor area (GFA) for commercial developments, and per household for residential developments. Estimates were then applied to the relevant GFA or number of households for each development, by modelled zones.

6.2.6 Trip rate estimates were generated for both the existing and proposed developments using the TRICS database. The existing trip rates are deducted from the proposed trip rates, on an individual site-by-site basis to calculate the addition/reduction in trips. These additions/reductions in trips are then aggregated on a zonal scale to result in a zonal addition/reduction in trips for each scenario.

6.2.7 Three vehicle types are modelled within SINTRAM: Cars, LGVs and HGVs. Consequently vehicle proportions were calculated for these vehicle types from the corresponding surveys in the TRICS database.

6.2.8 Whilst different trip rates were generated for each category of development for each land use, trip rates also needed to be extracted to appropriate corresponding TRICS locations. The TRICS database classifies all surveys conducted at a development as being in one of the following locations (see Appendix C for the TRICS definitions of each location):

- Town Centre;
- Edge of Town Centre;
- Neighbourhood Centre;
- Suburban Area;
- Edge of Town;
- Free Standing.

6.2.9 The methodology for assigning a TRICS location to each development differed between some of the developments. A number of developments (namely those committed by planning permission) provided addresses for each development, allowing a TRICS location to be assigned accurately. However, it is not possible for addresses to be provided for some developments (e.g. high case developments in scenario 2), so it was necessary to award and proportion TRICS locations to entire zones of the borough. *Table 6.2* shows the TRICS locations awarded to the zones in Reigate & Banstead. The percentages represent a subjective estimate of the proportion to the type of TRICS locations within each modelled zone, based on local knowledge and use of aerial photography.

Zone No.	Zone Name	TRICS Location	Comments
105	Redhill - Marketfield Way	80% Neighbourhood Centre	Large part of the zone is a residential area with local amenities such as schools. Covers the northern and middle section of the zone.
		20% Edge of Town Centre	Southern edge of this zone is in close proximity to the town centre and contains two car parks within walking distance of main shopping area.
106	Reigate - Reigate Hill	20% Edge of Town Centre	South-east of the zone is within walking distance to town centre and public amenities such as the train station.
		80% Edge of Town	Rest of the zone is predominantly sparse and relatively rural. Residential areas but with extensive areas of woodland.
110	Reigate - Reigate Rd / Linkfield Corned	70% Neighbourhood Centre	All of zone apart from west and (N)-west edge near Reigate town centre is residential, with amenities such as schools and leisure facilities.
		30% Edge of Town Centre	West and (N)-western edge of zone is in close proximity to Reigate town centre and is an urban area with businesses located within it.
113	Redhill - Earlswood	40% Neighbourhood Centre	Western part of the zone (covering Earlswood) is a predominantly residential area with the transport link of a train station.
		60% Suburban Area	Remaining part of the zone is more remote and sparse with small residential settlements scattered through.
114	Redhill - Earlswood Common	80% Suburban Area	Entire zone apart from the eastern edge is comprised of residential housing and amenities such as golf course and hospital.
		20% Edge of Town	The western edge of the zone is more rural and sparse.
116	Horley - East	100% Neighbourhood Centre	Zone comprised of residential housing.
163	Redhill - Holmethorpe East	50% Edge of Town	Western half of the zone is comprised of residential housing as well as some large business units.
		50% Free Standing	Eastern half of the zone is relatively rural with very few settlements.
164	Redhill - Town Centre	70% Edge of Town Centre	Majority of the zone is between Redhill and Merstham town centres with the train line running along the eastern edge of the zone.
		30% Free Standing	(N)-western edge of the zone is relatively rural and has few settlements.
166	Horley - Town Centre	20% Town Centre	Central to this zone is Horley town centre.
		80% Neighbourhood Centre	Rest of this zone is highly populated as nearly all roads are residential.
264	Horley - Meath Green	100% Suburban Area	Whole zone is comprised of residential housing.
271	Horley - (N) East	10% Edge of Town	The western edge of the zone has a small settlement of houses along the edge of the A23.
		90% Free Standing	The remainder of this zone is entirely free standing with no settlements.
272	Reigate - Gatton Pk & Wray Pk	40% Edge of Town	The southern part of this zone is comprised of residential housing but also borders the edge of Reigate town with predominantly rural land.
		60% Free Standing	The rest of this zone is rural countryside with only a couple of sparsely populated settlements.
273	Reigate - Nutley Ln Area & Reigate Business Pk	20% Town Centre	The eastern edge of this zone is within Reigate town centre, comprised mainly of offices located in very close proximity to the train station.
		80% Edge of Town Centre	Rest of the zone is residential but quite densely populated, and located within walking distance of the town centre.
276	Reigate - Woodhatch	100% Neighbourhood Centre	Entirely residential area.
287	Redhill - Redstone Hill & Kingswood Business Pk	20% Town Centre	Centre of this zone contains Redhill train station which is a few minutes' walk from the main shopping area of Redhill.
		80% Edge of Town Centre	Rest of zone is in close proximity to the town centre but is mainly comprised of a mix of office/business space and urban residential housing.
288	Redhill - Brighton Rd	100% Edge of Town Centre	Zone in relative proximity to Redhill town centre as much traffic passes through to reach the centre. Many businesses and industries in zone.
289	Redhill - Station	70% Town Centre	Majority of zone (western side) is located in Redhill town centre and provides services of car parking and the bus station.
		30% Edge of Town Centre	Eastern part of the zone is greater distance from the town centre but is still within walking distance as car parking is provided.
290	Reigate - Town Centre	50% Town Centre	Northern half of this zone is located within Reigate town centre.
		50% Suburban Area	Southern half of this zone is comprised of Reigate Park but is close to the town centre.
293	Horley - Haroldslea	100% Suburban Area	Zone is located between Horley and the M23. Quite a few settlements but appropriately named suburban as mix of urban and rural.
302	Reigate - Reigate Heath	10% Neighbourhood Centre	Northern part of the zone surrounding the A25 is comprised of small residential roads.
		90% Free Standing	The remaining southern part of the zone is very rural with few scattered settlements.
308	South Earlswood	50% Neighbourhood Centre	The eastern half of this zone is completely residential.
		50% Free Standing	The western half of the zone is rural with very few settlements.
312	Redhill - Marketfield Way	100% Town Centre	Zone covers Redhill town centre.

Zone No.	Zone Name	TRICS Location	Comments
313	Redhill - St. Johns	100% Neighbourhood Centre	Zone is predominantly residential housing.
376	Redhill - Town Centre	100% Town Centre	Zone covers Redhill town centre.
392	Salfords	20% Suburban Area	Land surrounding Salford's train station is a small residential area between Redhill and Horley town centre.
		80% Free Standing	The rest of the zone is very rural and only contains few isolated settlements.
393	Kingswood	70% Neighbourhood Centre	Majority of the Northern part of the zone is residential, and the western edge of the zone follows the line of the A217.
		30% Edge of Town	The southern section of the zone is more rural and sparsely populated.
394	Chipstead & Hooley	50% Neighbourhood Centre	Northern section of the zone (above Chipstead) is comprised of residential streets, with amenities of train stations.
		50% Free Standing	The southern half of the zone is very rural, populated by small, scattered settlements.
395	Tadworth & Walton on the Hill	60% Neighbourhood Centre	Majority of the (N)-western section of the zone contains residential housing centred on Tadworth town centre and train station.
		40% Free Standing	The remainder of the zone (south-east) is predominantly rural countryside and incorporates Banstead Heath.
396	Nork	100% Neighbourhood Centre	Zone covers the residential area of Banstead, including Banstead train station on the Northern edge.
397	Banstead	90% Neighbourhood Centre	The entire zone apart from southern section is residential, centred on Banstead, and incorporates amenities such as schools.
398	Merstham	10% Free Standing	The Northern edge of the zone is very rural and has few settlements located within it.
		100% Suburban Area	Entire zone incorporates residential settlements as well as the M25 Junction 7. Settlement that is a mixture of urban and rural land uses.
399	Tattenham	100% Suburban Area	Large residential area between Tadworth and Banstead.
400	Burgh Heath & Preston	100% Neighbourhood Centre	Large residential area between Tattenham Corner and Tadworth train stations.
504	East Surrey Hospital & Whitebushes	100% Edge of Town	Predominantly rural landscape with few large settlements.
518	Reigate - Doversgreen & South Pk	40% Edge of Town	Northern half of this zone is located south of Reigate town centre with a number of settlements.
		60% Free Standing	Southern half of this zone is predominantly rural with far less settlements than the Northern half.

Table 6.2: Zones within the borough of Reigate & Banstead classified and proportioned to TRICS locations

6.3   Additional Trips

6.3.1   Tables 6.3 to 6.7 shows the estimated number of additional departure and arrival trips generated from the proposed development by zone during the modelled average AM peak period for Scenario 1a (Scenario 1a input only), Scenario 1b (Scenario 1a and Scenario 1b input), Scenario 2 (Scenario 1a, Scenario 1b and Scenario 2 input) and Scenario 3 (Scenario 1a, Scenario 1b, Scenario 2 and Scenario 3 input). The estimated numbers of additional trips are based on a 2009 base year and 2026 forecast year.

6.3.2   *Table 6.2* shows a summary of the total number of estimated departure and arrival trips for each modelled scenario, for all vehicle types.

Scenario	Additional Departures	Additional Arrivals	Total Additional
Scenario 1a	509	106	615
Scenario 1b	1,780	1,007	2,786
Scenario 2	2,514	1,551	4,064
Scenario 3	2,848	1,671	4,519

Table 6.3: Estimated number of total additional departures and arrivals

6.3.3   The negative values that appear in Tables 6.4 to 6.7 relate to an overall reduction in trips for particular zones, caused by a change in land use i.e. a switch from commercial to residential or a large change in the Gross Floor Area of the development or the number of dwellings. Such changes can have an impact on the amount of trips produced from a development and more specifically change the balance in the amount of departure and arrival trips.

Zone No.	Zone Name	Total Additional Trips							
		Additional Departures				Additional Arrivals			
		Total	Car	LGV	HGV	Total	Car	LGV	HGV
105	Redhill-Marketfield Way	12	11	1	0	11	9	1	0
106	Reigate-Reigate Hill	4	4	0	0	3	3	0	0
110	Reigate-Reigate Rd / Linkfield Corner	10	9	1	0	-13	-12	-1	-0
113	Redhill-Earlswood	8	7	1	0	0	0	0	0
114	Redhill-Earlswood Common	11	10	1	0	3	3	0	0
116	Horley-East	0	0	0	0	0	0	0	0
163	Redhill-Holmethorpe East	78	69	7	2	26	17	5	4
164	Redhill-Town Centre	8	7	1	0	-71	-65	-5	-1
166	Horley-Town Centre	10	9	1	0	-4	-4	-0	-0
264	Horley-Meath Green	31	29	2	0	13	12	1	0
271	Horley-(N) East	136	126	9	1	48	45	3	0
272	Reigate Gatton Park & Wray Pk	25	23	2	0	5	5	0	0
273	Nutley Ln Area & Reigate Business Pk	3	2	0	0	9	8	1	0
276	Reigate-Woodhatch	1	1	0	0	-2	-2	-0	-0
287	Redstone Hill & Kingswood Business Pk	0	0	0	0	0	0	0	0
288	Redhill-Brighton Rd	5	5	0	0	-0	-0	-0	-0
289	Redhill-Station	1	1	0	0	-1	-1	-0	-0
290	Reigate-Town Centre	1	1	0	0	-3	-3	-0	-0
293	Horley-Haroldslea	-4	-3	-0	-0	-6	-5	-1	-0
302	Reigate-Reigate Heath	2	2	0	0	-0	-0	-0	-0
308	South Earlswood	-0	-0	-0	-0	-0	-0	-0	-0
312	Redhill-Marketfield Way	4	3	0	0	-3	-3	-0	-0
313	Redhill-St. Johns	6	5	0	0	2	2	0	0
376	Redhill-Town Centre	36	32	3	1	19	16	2	0
392	Salfords	9	7	1	1	45	33	5	7
393	Kingswood	30	28	2	0	-3	-2	-0	-0
394	Chipstead & Hooley	1	1	0	0	-13	-12	-1	-0
395	Tadworth & Walton on the Hill	12	11	1	0	-3	-3	-0	-0
396	Nork	43	39	3	0	19	17	2	0
397	Banstead	20	18	2	0	23	21	2	0
398	Merstham	11	10	1	0	10	7	2	1
399	Tattenham	10	9	1	0	-4	-4	-0	-0
400	Burgh Heath & Preston	2	2	0	0	0	0	0	0
504	East Surrey Hospital & Whitebushes	-1	-1	-0	-0	-3	-3	-0	-0
518	Reigate-Doversgreen & South Pk	-17	-15	-1	-0	-1	-1	-0	-0
		509	463	37	9	106	78	16	13

Table 6.4: Estimated additional departures and arrivals in the average AM peak period (0700 – 1000) for Scenario 1a

Zone No.	Zone Name	Total Additional Trips							
		Additional Departures				Additional Arrivals			
		Total	Car	LGV	HGV	Total	Car	LGV	HGV
105	Redhill-Marketfield Way	24	21	2	0	27	24	3	0
106	Reigate-Reigate Hill	7	6	0	0	4	3	0	0
110	Reigate-Reigate Rd / Linkfield Corner	9	9	1	0	-26	-24	-2	-0
113	Redhill-Earlswood	8	7	1	0	0	0	0	0
114	Redhill-Earlswood Common	11	10	1	0	4	3	0	0
116	Horley-East	0	0	0	0	0	0	0	0
163	Redhill-Holmethorpe East	81	71	7	3	13	2	5	6
164	Redhill-Town Centre	35	33	2	0	-93	-85	-7	-1
166	Horley-Town Centre	7	6	1	0	-67	-61	-5	-1
264	Horley-Meath Green	366	339	24	4	154	142	10	2
271	Horley-(N) East	136	126	9	1	48	45	3	0
272	Reigate Gatton Park & Wray Pk	27	25	2	0	5	5	0	0
273	Nutley Ln Area & Reigate Business Pk	3	2	0	0	9	8	1	0
276	Reigate-Woodhatch	1	1	0	0	-2	-2	-0	-0
287	Redstone Hill & Kingswood Business Pk	31	27	3	1	-1	-1	-0	-0
288	Redhill-Brighton Rd	5	5	0	0	-0	-0	-0	-0
289	Redhill-Station	792	746	38	8	1,047	986	51	10
290	Reigate-Town Centre	19	16	2	0	35	30	4	1
293	Horley-Haroldslea	-4	-3	-0	-0	-6	-5	-1	-0
302	Reigate-Reigate Heath	2	2	0	0	-0	-0	-0	-0
308	South Earlswood	-0	-0	-0	-0	-0	-0	-0	-0
312	Redhill-Marketfield Way	35	33	2	0	34	31	2	0
313	Redhill-St. Johns	8	7	1	0	-4	-4	-0	-0
376	Redhill-Town Centre	86	77	7	1	-26	-24	-1	-0
392	Salfords	4	-3	2	6	88	45	14	28
393	Kingswood	-71	-66	-5	-1	-182	-168	-12	-2
394	Chipstead & Hooley	1	1	0	0	-13	-12	-1	-0
395	Tadworth & Walton on the Hill	13	12	1	0	-5	-4	-0	-0
396	Nork	43	39	3	0	19	17	2	0
397	Banstead	-3	-3	-0	-0	-60	-53	-6	-1
398	Merstham	-3	-3	-0	0	-28	-26	-2	0
399	Tattenham	10	9	1	0	-4	-4	-0	-0
400	Burgh Heath & Preston	115	106	8	1	42	38	3	0
504	East Surrey Hospital & Whitebushes	-1	-1	-0	-0	-3	-3	-0	-0
518	Reigate-Doversgreen & South Pk	-17	-15	-1	-0	-1	-1	-0	-0
		1,780	1,641	111	27	1,007	902	60	44

Table 6.5: Estimated additional departures and arrivals in the average AM peak period (0700 – 1000) for Scenario 1b

Zone No.	Zone Name	Total Additional Trips							
		Additional Departures				Additional Arrivals			
		Total	Car	LGV	HGV	Total	Car	LGV	HGV
105	Redhill-Marketfield Way	41	37	3	1	34	30	3	0
106	Reigate-Reigate Hill	21	20	1	0	9	8	1	0
110	Reigate-Reigate Rd / Linkfield Corner	22	20	1	0	-20	-18	-1	-0
113	Redhill-Earlswood	16	15	1	0	4	4	0	0
114	Redhill-Earlswood Common	16	15	1	0	6	5	0	0
116	Horley-East	13	11	1	1	20	15	2	2
163	Redhill-Holmethorpe East	198	181	13	3	205	184	15	6
164	Redhill-Town Centre	40	37	2	0	-91	-83	-7	-1
166	Horley-Town Centre	55	50	4	1	-60	-55	-5	-1
264	Horley-Meath Green	394	364	26	4	166	153	11	2
271	Horley-(N) East	148	137	10	1	53	49	4	1
272	Reigate Gatton Park & Wray Pk	45	42	3	0	12	11	1	0
273	Nutley Ln Area & Reigate Business Pk	7	6	1	0	12	10	1	0
276	Reigate-Woodhatch	16	15	1	0	4	4	0	0
287	Redstone Hill & Kingswood Business Pk	25	21	3	1	-8	-8	1	-0
288	Redhill-Brighton Rd	25	23	2	0	67	61	5	1
289	Redhill-Station	848	796	44	8	1,105	1,037	57	11
290	Reigate-Town Centre	24	21	2	0	37	32	4	1
293	Horley-Haroldslea	-1	-1	-0	0	-5	-4	-1	-0
302	Reigate-Reigate Heath	8	7	1	0	2	2	0	0
308	South Earlswood	5	5	0	0	2	1	0	0
312	Redhill-Marketfield Way	38	35	2	0	36	33	2	0
313	Redhill-St. Johns	27	25	2	0	3	3	0	0
376	Redhill-Town Centre	93	83	8	1	-22	-21	-1	-0
392	Salfords	17	8	3	6	96	53	15	29
393	Kingswood	6	5	0	0	-155	-143	-10	-1
394	Chipstead & Hooley	31	28	2	0	-2	-2	-0	0
395	Tadworth & Walton on the Hill	50	46	3	0	12	11	1	0
396	Nork	78	72	5	1	37	34	3	0
397	Banstead	33	30	3	0	-54	-47	-5	-1
398	Merstham	10	9	1	0	-21	-20	-2	0
399	Tattenham	42	38	3	0	22	20	2	0
400	Burgh Heath & Preston	118	109	8	1	43	39	3	0
504	East Surrey Hospital & Whitebushes	4	4	0	0	-1	-1	-0	-0
518	Reigate-Doversgreen & South Pk	1	1	0	0	5	5	0	0
		2,514	2,318	162	34	1,551	1,401	99	50

Table 6.6: Estimated additional departures and arrivals in the average AM peak period (0700 – 1000) for Scenario 2

Zone No.	Zone Name	Total Additional Trips							
		Additional Departures				Additional Arrivals			
		Total	Car	LGV	HGV	Total	Car	LGV	HGV
105	Redhill-Marketfield Way	41	37	3	1	34	30	3	0
106	Reigate-Reigate Hill	21	20	1	0	9	8	1	0
110	Reigate-Reigate Rd / Linkfield Corner	22	20	1	0	-20	-18	-1	-0
113	Redhill-Earlswood	41	38	3	0	13	12	1	0
114	Redhill-Earlswood Common	16	15	1	0	6	5	0	0
116	Horley-East	13	11	1	1	20	15	2	2
163	Redhill-Holmethorpe East	324	298	22	4	251	226	18	7
164	Redhill-Town Centre	40	37	2	0	-91	-83	-7	-1
166	Horley-Town Centre	55	50	4	1	-60	-55	-5	-1
264	Horley-Meath Green	394	364	26	4	166	153	11	2
271	Horley-(N) East	148	137	10	1	53	49	4	1
272	Reigate Gatton Park & Wray Pk	45	42	3	0	12	11	1	0
273	Nutley Ln Area & Reigate Business Pk	7	6	1	0	12	10	1	0
276	Reigate-Woodhatch	16	15	1	0	4	4	0	0
287	Redstone Hill & Kingswood Business Pk	56	51	5	1	4	2	1	-0
288	Redhill-Brighton Rd	25	23	2	0	67	61	5	1
289	Redhill-Station	848	796	44	8	1,105	1,037	57	11
290	Reigate-Town Centre	24	21	2	0	37	32	4	1
293	Horley-Haroldslea	-1	-1	-0	0	-5	-4	-1	-0
302	Reigate-Reigate Heath	8	7	1	0	2	2	0	0
308	South Earlswood	5	5	0	0	2	1	0	0
312	Redhill-Marketfield Way	38	35	2	0	36	33	2	0
313	Redhill-St. Johns	27	25	2	0	3	3	0	0
376	Redhill-Town Centre	93	83	8	1	-22	-21	-1	-0
392	Salfords	17	8	3	6	96	53	15	29
393	Kingswood	6	5	0	0	-155	-143	-10	-1
394	Chipstead & Hooley	31	28	2	0	-2	-2	-0	0
395	Tadworth & Walton on the Hill	50	46	3	0	12	11	1	0
396	Nork	78	72	5	1	37	34	3	0
397	Banstead	33	30	3	0	-54	-47	-5	-1
398	Merstham	10	9	1	0	-21	-20	-2	0
399	Tattenham	42	38	3	0	22	20	2	0
400	Burgh Heath & Preston	118	109	8	1	43	39	3	0
504	East Surrey Hospital & Whitebushes	4	4	0	0	-1	-1	-0	-0
518	Reigate-Doversgreen & South Pk	151	140	10	1	60	55	4	1
		2,848	2,626	184	37	1,671	1,513	107	51

Table 6.7: Estimated additional departures and arrivals in the average AM peak period (0700 – 1000) for Scenario 3

6.3.4   In summary *Table 6.8* presents the proportion of commercial and residential additional trips by scenario.

Development Type	Departures	Arrivals	Departures & Arrivals
Scenario 1a			
Commercial	17%	163%	42%
Residential	83%	-63%	58%
Total	*100%*	*100%*	*100%*
Scenario 1b			
Commercial	63%	150%	95%
Residential	37%	-50%	5%
Total	*100%*	*100%*	*100%*
Scenario 2			
Commercial	55%	123%	81%
Residential	45%	-23%	19%
Total	*100%*	*100%*	*100%*
Scenario 3			
Commercial	48%	114%	73%
Residential	52%	-14%	27%
Total	*100%*	*100%*	*100%*

Table 6.8: Proportion of estimated additional trips by type of development and scenario

6.3.5   The negative values in Table 6.8 are due to changes in land use or size between the existing and proposed development, resulting in an overall reduction in arrival trips being generated from residential developments, which is present in all modelled scenarios. However the total scenarios additional trips become positive when summed with additional trips generated from commercial developments.

6.3.6   Figures 6.1 to 6.8 show the disposition of estimated additional trips generated by RBBC's planning data for both commercial and residential planning sites for all zones in the borough. The estimated additional trips are shown in percentage terms using 'pie charts'. The areas of the pie charts are proportional to the zone containing the greatest amount of estimated additional trips. The plots are separated to show both departures and arrivals for each scenario individually.

6.3.7   Figures 6.1 to 6.8 graphically display the information given in Table 6.8 on a zonal basis, for all zones within the borough of Reigate & Banstead. These plots are pictorial representations of the development scenario trajectories and show where the estimated additional trips generated by the planning data occur.

6.3.8   A strategic model operates on a zonal basis. Therefore it is not possible to allocate additional trips to specific links, but instead allocate trips to start or terminate to a central point within a zone. These central points are known as zone centroids (shown as asterisks along with the zone numbers); the zone centroids are connected to the modelled highway network via centroids connectors (light green links attached to a centroid). Due to centroids being located to a central point in a zone, Figures 6.3 to 6.6 show that the pie for each zone is located to the top left of the centroid.
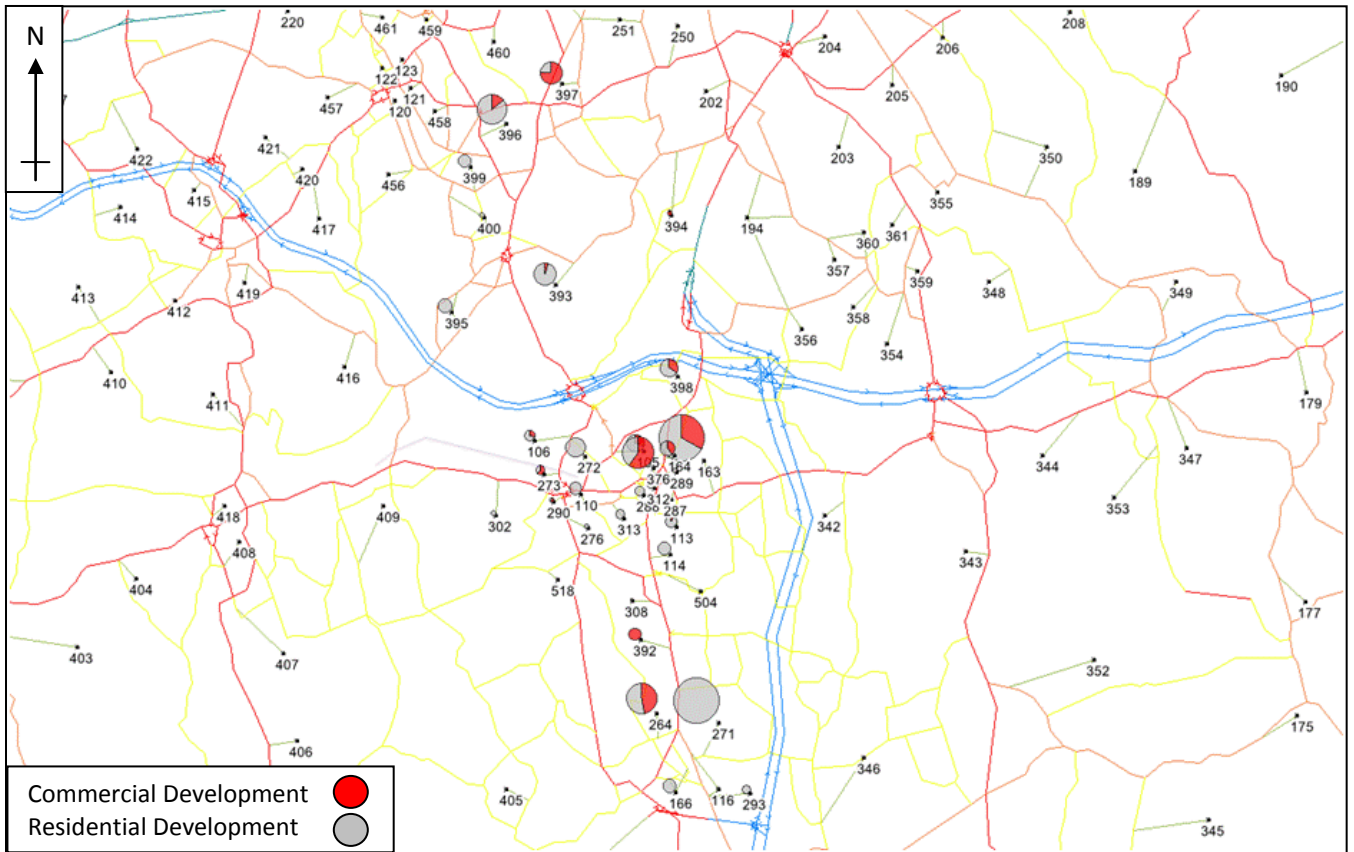
Figure 6.1: 2026 Scenario 1a dispositions of estimated additional departure trips
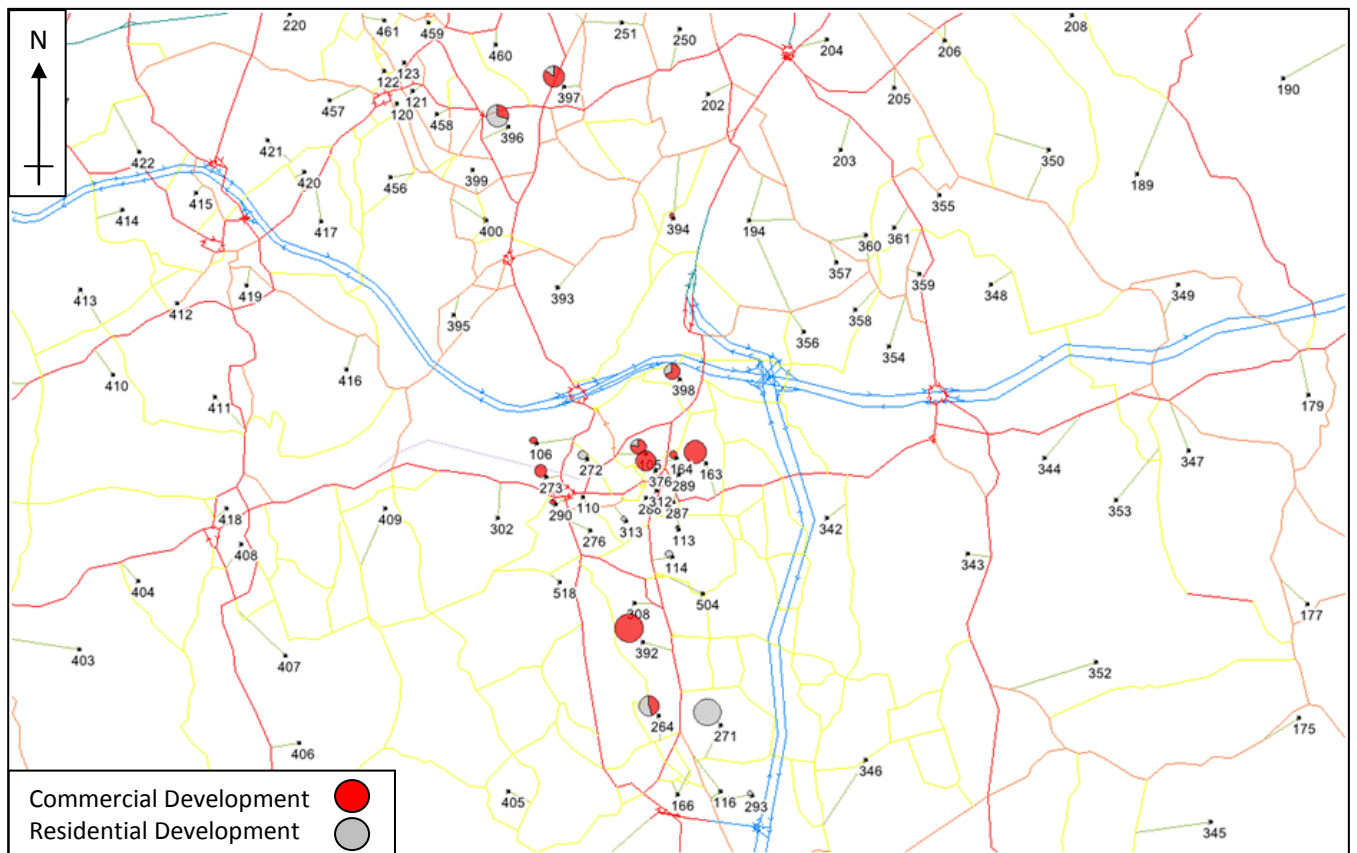
Figure 6.2: 2026 Scenario 1a dispositions of estimated additional arrival trips
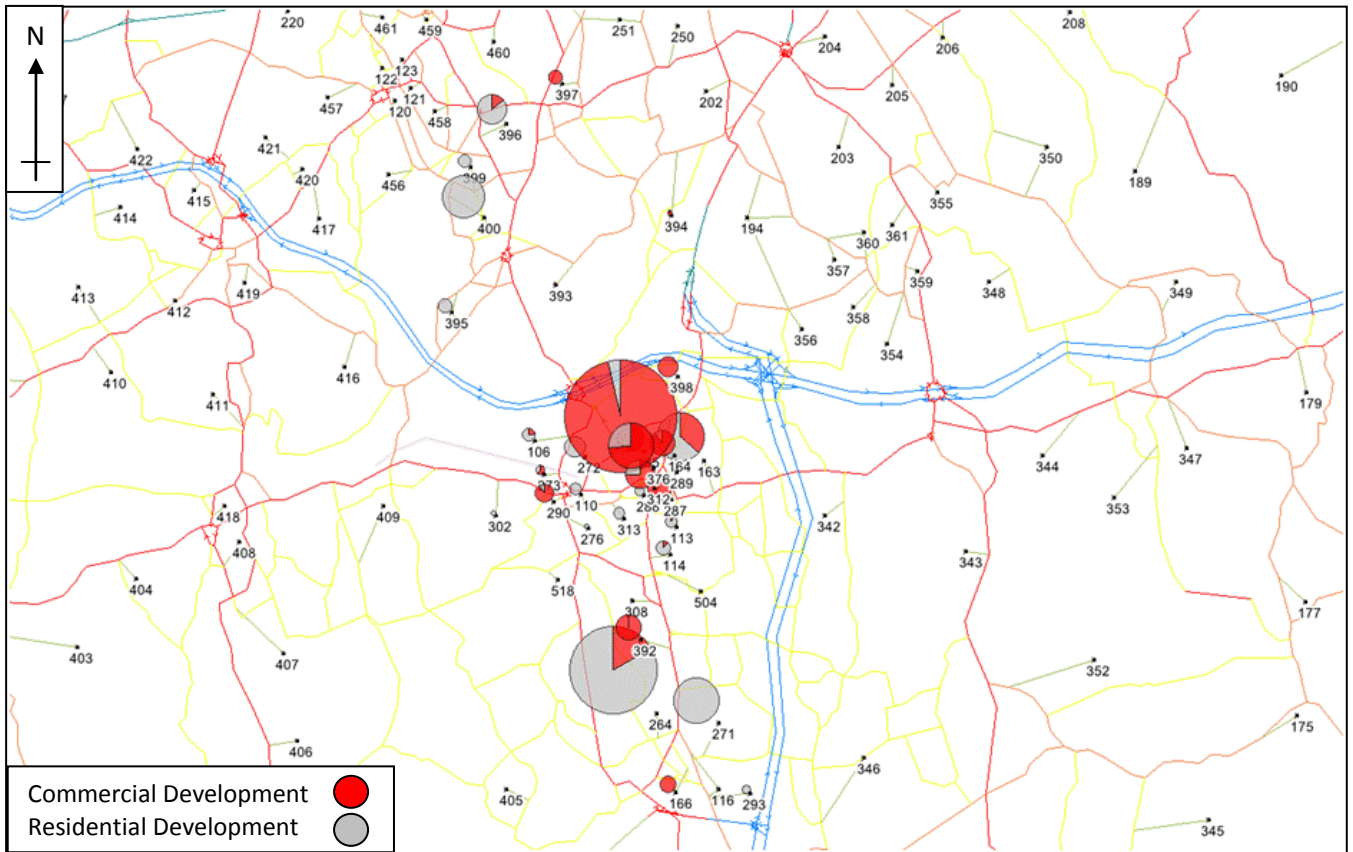
Figure 6.3: 2026 Scenario 1b dispositions of estimated additional departure trips
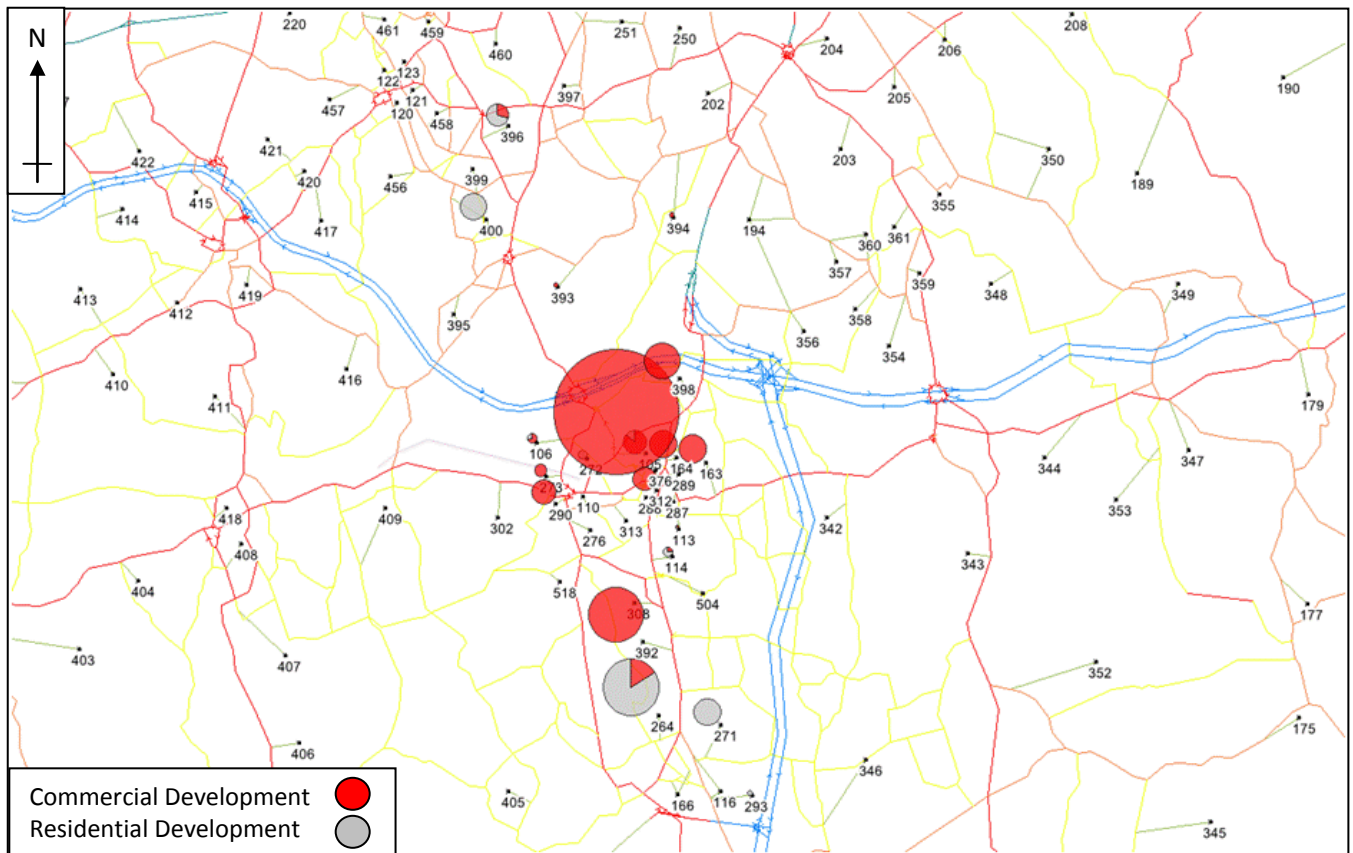
Figure 6.4: 2026 Scenario 1b dispositions of estimated additional arrival trips
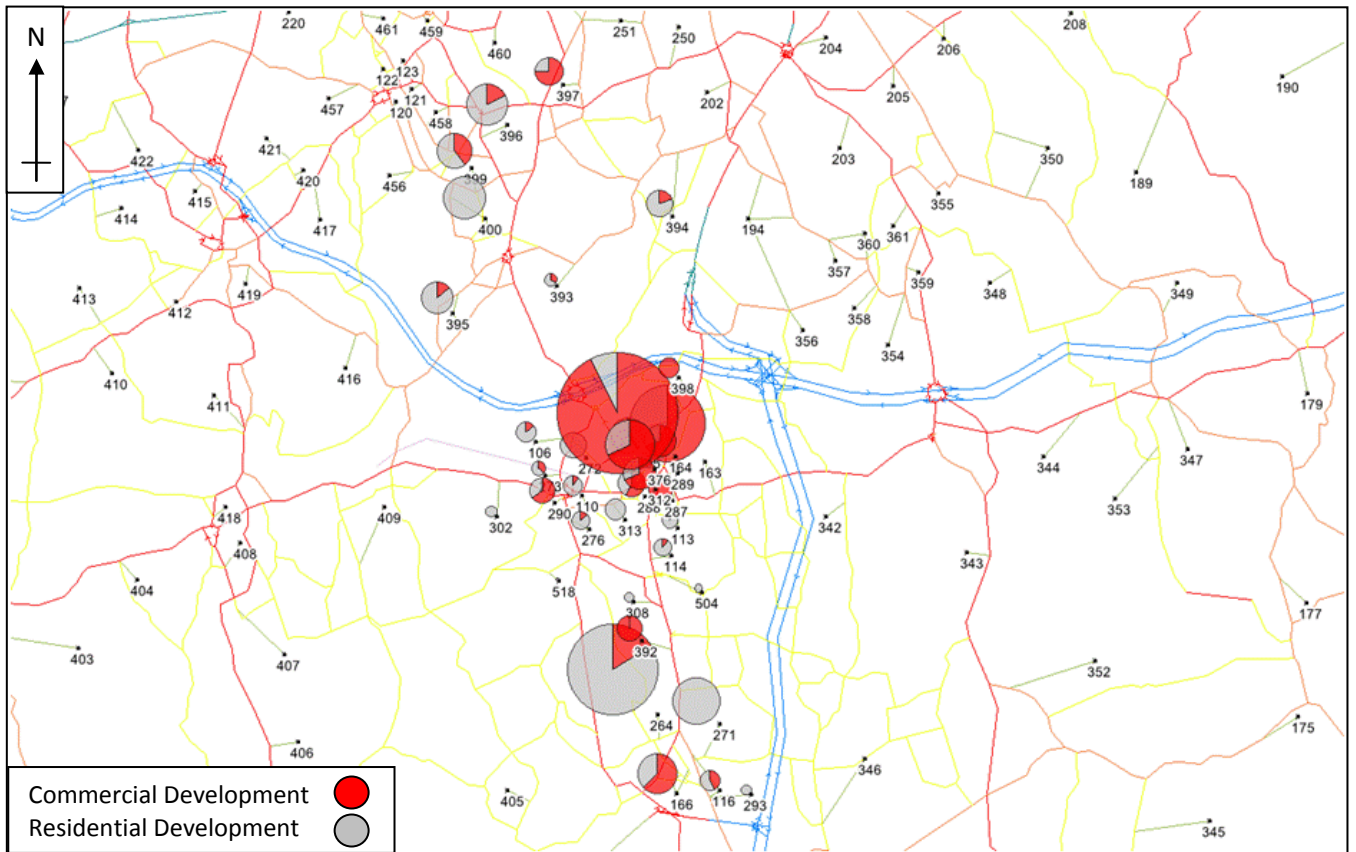
Figure 6.5: 2026 Scenario 2 dispositions of estimated additional departure trips
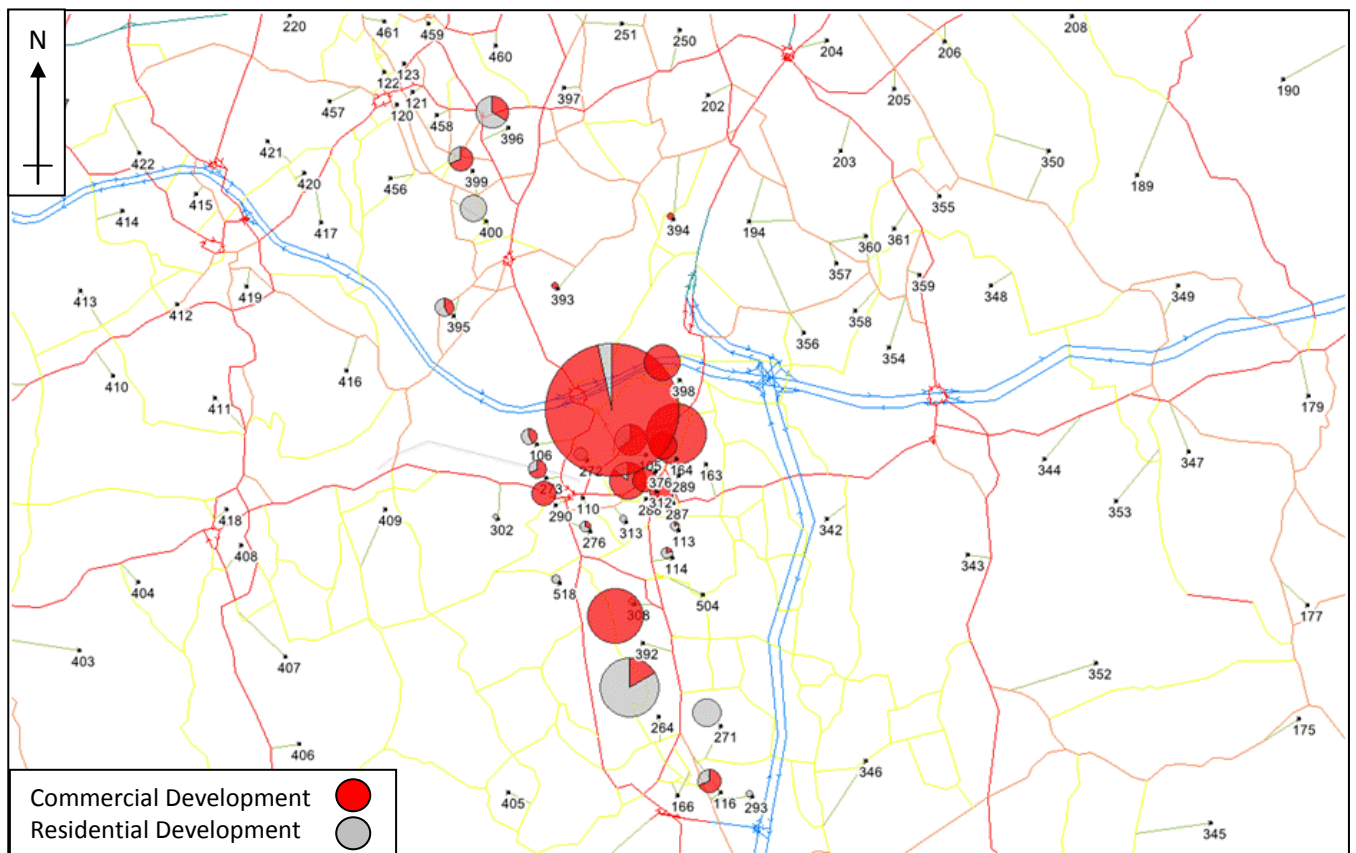
Figure 6.6: 2026 Scenario 2 dispositions of estimated additional arrival trips
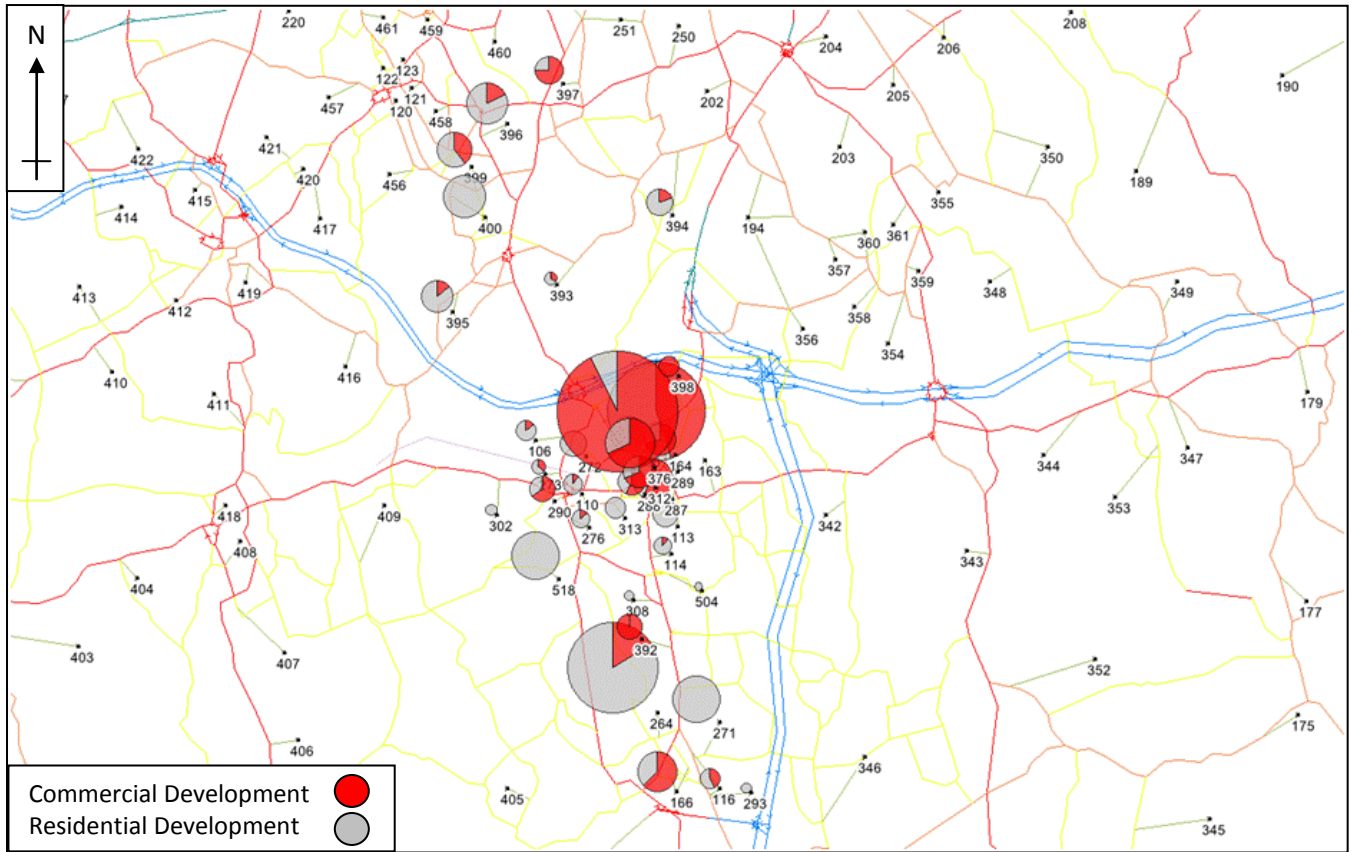
Figure 6.7: 2026 Scenario 3 dispositions of estimated additional departure trips
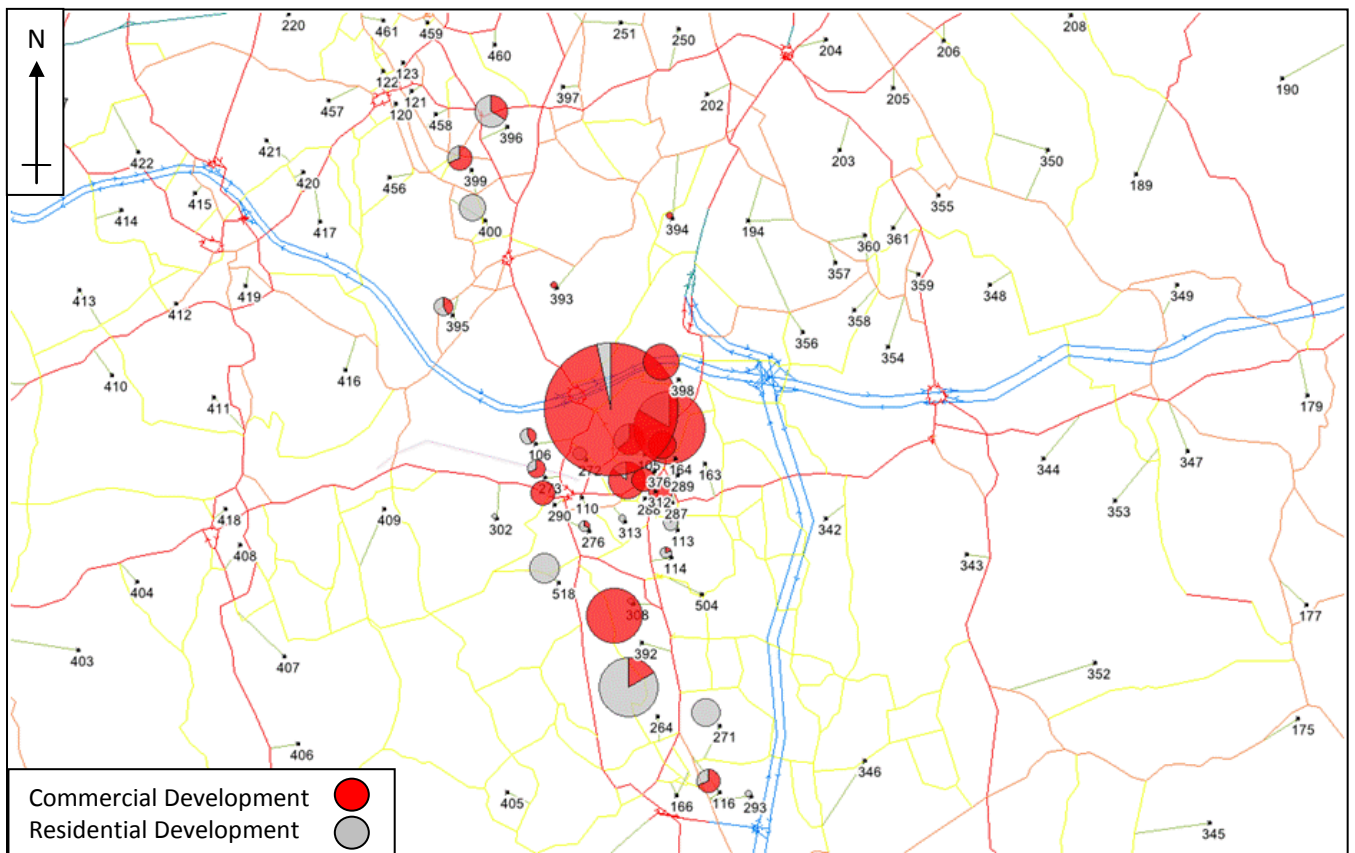
Figure 6.8: 2026 Scenario 3 dispositions of estimated additional arrival trips

6.3.9   By making comparisons between Figures 6.1 to 6.8, scenario 1a has the least amount of additional trips (departures and arrivals) and scenario 3 has the greatest amount of additional trips (departures and arrivals). The greatest amount of growth between two scenarios is present between scenario 1a and scenario 1b.

6.3.10   Figures 6.1 and 6.2 indicate the size and distribution of estimated additional trips in Scenario 1a. The greatest amount of additional departure trips in scenario 1a are located in Redhill (zones 163 – Holmethorpe East and 376 – Redhill Town Centre), Horley (zones 264 – Horley Meath Green and 271 – Horley (N) East) and Banstead (zones 396 – Nork and 397 – Banstead). These greatest areas of additional departure trips are generated from a combination of commercial and residential developments. The quantity and distribution of additional arrival trips in scenario 1a follows a similar pattern to that of the departure trips.

6.3.11   Figures 6.3 and 6.4 indicate that the greatest amount of additional departure trips in Scenario 1b are located in Redhill and Horley. In Redhill the greatest amount of departures is primarily generated by commercial development in zone 289 – Redhill Station. Whereas the greatest amount of departure trips in Horley is mainly produced from residential development in zone 264 – Horley Meath Green. These zones also generate the greatest amount of additional arrival trips in scenario 1b as well as zone 392 - Salfords, although in zone 289 the arrival trips are completely generated from commercial developments.

6.3.12   The distribution of additional trips in scenario 2 is presented in Figures 6.5 and 6.6. When comparing these figures to figures for scenario 1a (Figures 6.3 and 6.4), there appears to be more growth in the (N) of the borough for departure trips, specifically zone 400 – Burgh Heath & Preston and zone 397 – Banstead. Zone 163 in Redhill (Holmethorpe East) also incurs an increase in departure trips, predominantly sourced from commercial developments. In relation to arrival trips in scenario 2, there appears to be general growth throughout the borough (when compared to scenario 1b) but the distribution related to this growth is relatively similar to that in scenario 1b.

6.3.13   The only difference between scenario 2 and scenario 3 is the inclusion of additional residential development in part of the green belt land of the borough. Therefore when comparing the pie chart plots for scenarios 2 (Figure 6.5 and 6.6) and 3 (Figures 6.7 and 6.8) there is not much growth, apart from in a few zones covering the green belt land. Of such zones, zone 518- Reigate Doversgreen & South Park and zone 400 – Burgh Heath & Preston incur the greatest increases in residential trips.

6.4   Trip Ends

6.4.1   Trip ends are the total number of trips that either have an origin (origin (departure) trip ends) or destination (destination (arrival) trip ends) within the defined modelled zone.

6.4.2   The model base year is 2009. Trip ends from the 2009 matrix (reference 2009_syn_vehC1K) were extracted from the zones within the borough of Reigate & Banstead. These were combined with the DfT's **T**rip **E**nd **M**odel **Pro**gramme (TEMPRO) forecast of 2009 to 2026 'full development' (all planned development including background growth) and 'background growth' (changes in demographics and car ownership only) growth factors. The 2009 to 2026 'full development' growth factors were applied to all 2009 trip ends for zones outside of this assessments study area i.e.

every zone but those in Reigate & Banstead. The 2009 to 2026 'background growth' growth factors were applied to the 2009 trip ends only for zones in the borough of Reigate & Banstead. This resulted in the creation of the 2026 Do-Minimum matrix.

6.4.3   2026 Development scenario forecast matrices (scenarios 1a, 1b, 2 and 3), were created using the Reigate & Banstead 2026 Do-Minimum matrix and combining this matrix with the new estimated trip ends generated from the boroughs planning data (see Tables 6.4 to 6.7). The development trip ends were distributed using a growth factor method. This process was initially performed for scenario 1a and again, separately, for Scenarios 1b, 2 and 3. However, to create scenario 1b Scenario 1a was used as a starting point to the process, Scenario 1b was used as a starting point for Scenario 2 and Scenario 2 was used as a starting point for the creation of scenario 3 (refer to Section 7 for more detail). The creation of multiple scenarios enables comparisons and reference cases to be used, providing the model outputs with more relevance. The 2026 Do-Minimum acts as a reference case for scenario 1a, scenario 1a acts as a reference for scenario 1b, scenario 1b acts as a reference for scenario 2 and scenario 2 acts as a reference for scenario 3.

6.4.4   Table 6.9 and 6.10 display origin and destination trip ends, separately, for the 2009 base, 2026 Do-Minimum and the four development scenario scenarios (scenarios 1a, 1b, 2 and 3), i.e. the outcome of adding the additional trips to the model and incorporating them in a trip matrix.

Zone No.	Zone Name	2009	2026 Do-Minimum	2026 Scenario 1a	2026 Scenario 1b	2026 Scenario 2	2026 Scenario 3	2026 Do-Minimum less 2009	2026 Scenario 1a less 2026 Do-Minimum	2026 Scenario 1b less 2026 Scenario 1a	2026 Scenario 2 less 2026 Scenario 1b	2026 Scenario 3 less 2026 Scenario 2
105	Redhill - Marketfield Way	915	921	936	973	1,003	1,006	6	15	37	30	3
106	Reigate - Reigate Hill	448	449	456	475	495	497	1	7	19	21	1
110	Reigate - Reigate Rd / Linkfield Corner	438	441	452	468	487	488	3	12	15	19	1
113	Redhill - Earlswood	558	562	564	574	588	614	4	2	9	14	26
114	Redhill - Earlswood Common	154	155	160	162	169	169	1	5	2	7	0
116	Horley - East	193	193	193	200	216	216	-0	1	7	16	1
163	Redhill - Holmethorpe East	193	194	270	279	400	529	1	76	8	122	128
164	Redhill - Town Centre	682	686	693	744	759	761	4	7	50	15	2
166	Horley - Town Centre	882	879	892	921	981	984	-3	13	28	61	3
264	Horley - Meath Green	1,622	1,618	1,656	2,049	2,104	2,110	-4	39	392	55	6
271	Horley - (N) East	393	392	531	549	569	570	-1	139	18	20	2
272	Reigate - Gatton Park & Wray Park	375	375	402	415	439	440	0	27	13	24	1
273	Nutley Ln Area & Reigate Business Pk	494	497	502	509	521	522	3	5	8	11	1
276	Reigate - Woodhatch	843	848	852	881	908	911	6	4	29	27	3
287	Redstone Hill & Kingswood Business Pk	558	562	563	613	615	649	4	0	51	2	34
288	Redhill - Brighton Rd	429	432	426	434	459	460	3	-6	8	25	1
289	Redhill - Station	58	58	60	883	953	956	0	1	824	69	3
290	Reigate - Town Centre	137	138	139	161	169	169	1	1	23	7	0
293	Horley - Haroldslea	88	87	84	87	91	91	-0	-3	3	3	0
302	Reigate - Reigate Heath	134	134	136	141	150	150	0	2	5	8	0
308	South Earlswood	265	266	265	272	281	282	0	-0	7	9	1
312	Redhill - Marketfield Way	204	205	210	249	255	256	1	4	39	6	1
313	Redhill - St. Johns	301	303	308	314	338	339	2	5	6	23	1
376	Redhill - Town Centre	105	106	143	198	207	208	1	37	55	10	1
392	Salfords	800	798	807	827	850	852	-2	10	19	23	2
393	Kingswood	424	420	452	358	440	442	-4	32	-94	83	1
394	Chipstead & Hooley	695	684	689	699	738	740	-11	5	10	39	2
395	Tadworth & Walton on the Hill	956	943	961	985	1,036	1,039	-12	17	25	51	3
396	Nork	1,076	1,066	1,114	1,105	1,156	1,159	-10	48	-9	51	3
397	Banstead	1,078	1,091	1,116	1,122	1,174	1,177	13	25	6	51	3
398	Merstham	2,191	2,187	2,207	2,271	2,315	2,322	-4	19	64	44	7
399	Tattenham	1,161	1,141	1,157	1,186	1,234	1,237	-20	15	29	48	4
400	Burgh Heath & Preston	350	344	348	472	482	483	-6	4	125	9	1
504	East Surrey Hospital & Whitebushes	228	228	227	231	240	240	0	-1	4	9	1
518	Reigate - Doversgreen & South Park	1,267	1,266	1,252	1,296	1,331	1,485	-1	-14	44	35	155
		20,693	20,668	21,223	23,102	24,148	24,553	-26	555	1,879	1,047	405

Table 6.9: Origin (departure) trip ends for the average AM peak period (0700 – 1000)

Zone No.	Zone Name	2009	2026 Do-Minimum	2026 Scenario 1a	2026 Scenario 1b	2026 Scenario 2	2026 Scenario 3	2026 Do-Minimum less 2009	2026 Scenario 1a less 2026 Do-Minimum	2026 Scenario 1b less 2026 Scenario 1a	2026 Scenario 2 less 2026 Scenario 1b	2026 Scenario 3 less 2026 Scenario 2
105	Redhill - Marketfield Way	1,271	1,297	1,329	1,400	1,437	1,450	26	32	71	37	13
106	Reigate - Reigate Hill	253	260	265	275	285	287	7	6	10	10	2
110	Reigate - Reigate Rd / Linkfield Corner	648	661	656	668	686	692	13	-5	12	19	6
113	Redhill - Earlswood	428	437	446	467	482	496	9	8	22	15	14
114	Redhill - Earlswood Common	248	252	260	273	281	284	4	8	13	8	3
116	Horley - East	169	172	174	177	200	202	3	3	2	23	2
163	Redhill - Holmethorpe East	201	207	236	230	430	479	5	29	-5	199	49
164	Redhill - Town Centre	545	555	494	493	505	510	11	-61	-1	13	5
166	Horley - Town Centre	1,076	1,096	1,105	1,078	1,103	1,111	20	9	-27	25	8
264	Horley - Meath Green	1,715	1,745	1,778	1,976	2,019	2,033	30	32	199	43	14
271	Horley - (N) East	527	536	593	616	632	638	9	57	23	16	5
272	Reigate - Gatton Park & Wray Park	525	539	554	565	585	590	14	14	12	19	6
273	Nutley Ln Area & Reigate Business Pk	504	514	532	549	563	568	10	17	17	14	5
276	Reigate - Woodhatch	804	820	827	851	871	877	16	7	24	20	6
287	Redstone Hill & Kingswood Business Pk	325	332	338	353	355	370	6	6	16	1	15
288	Redhill - Brighton Rd	598	610	620	650	732	740	12	10	30	82	8
289	Redhill - Station	98	100	100	1,198	1,281	1,292	2	1	1,097	83	11
290	Reigate - Town Centre	264	270	270	317	325	327	5	0	47	8	2
293	Horley - Haroldslea	118	122	117	122	125	126	3	-4	4	3	1
302	Reigate - Reigate Heath	397	408	414	430	441	444	11	6	16	11	4
308	South Earlswood	278	282	285	294	301	303	4	3	9	7	2
312	Redhill - Marketfield Way	445	453	455	516	529	535	9	2	60	14	5
313	Redhill - St. Johns	403	411	420	417	434	438	8	9	-3	17	4
376	Redhill - Town Centre	157	160	182	145	152	154	3	22	-37	7	1
392	Salfords	860	882	936	1,008	1,032	1,039	22	54	72	24	7
393	Kingswood	719	749	757	598	636	641	30	8	-159	38	5
394	Chipstead & Hooley	713	739	733	749	769	774	26	-6	16	21	4
395	Tadworth & Walton on the Hill	1,291	1,344	1,358	1,380	1,418	1,428	53	13	22	38	10
396	Nork	894	937	965	984	1,015	1,020	43	28	19	30	5
397	Banstead	1,139	1,200	1,238	1,192	1,216	1,225	61	38	-46	25	8
398	Merstham	2,002	2,056	2,091	2,121	2,162	2,177	54	35	30	41	15
399	Tattenham	952	996	1,005	1,036	1,081	1,090	44	9	31	45	8
400	Burgh Heath & Preston	426	446	451	501	509	513	20	5	50	8	3
504	East Surrey Hospital & Whitebushes	273	277	278	290	298	301	4	1	12	8	3
518	Reigate - Doversgreen & South Park	1,450	1,489	1,508	1,561	1,596	1,664	39	19	53	35	68
		22,714	23,352	23,768	25,478	26,486	26,815	638	416	1,710	1,008	329

Table 6.10: Destination (arrival) trip ends for the average AM peak period (0700 – 1000)

7   FORECAST MATRICES

7.1   Do-Minimum Forecast

7.1.1   In order to assess the effects of the additional planned commercial and residential development between 2009 and 2026, it is useful to have a reference case, which for this assessment is provided by the 2026 Do-Minimum.

7.1.2   The 2026 Do-Minimum modelled highway network includes the highway alterations of the HA's Hindhead Improvement Scheme and M25 widening between junctions 16 to 23 and junctions 27 to 30. The main outcome of the Hindhead Improvement Scheme is conversion of the single carriageway section of the A3 between the Thursley junction and Hammer Lane, to dual carriageway in both directions. The widening of the M25 entails an additional lane in each direction, converting the existing specified sections of the M25 from dual three lanes to dual four lane carriageway. The widening is to be undertaken around the (N) side of London between junctions 16 (M40) and 23 and between junctions 27 and 30 (A13 Interchange). Works commenced on widening between junctions 16 and 18 in May 2009 and it is projected to take three years to complete. Therefore both the Hindhead Improvement Scheme and M25 widening has been incorporated into the 2026 modelled highway network for the purpose of creating a realistic future traffic flows and interactions. HA documents and maps were used to incorporate the schemes into the modelled network. Therefore the only differences between the 2009 and 2026 network is the Hindhead Improvement Scheme and M25 widening.

7.1.3   The 2026 Do-Minimum trip matrix was created with use of the 2009 base matrix. The 2026 Do-Minimum matrix was created with use of TEMPRO version 5.4 trip end forecasts. 2009 to 2026 growth factors for 'full development' (all planned development including background growth) and 'background growth' (changes in demographics and car ownership only) growth factors were extracted from TEMPRO. The 2009 to 2026 'full development' growth factors were combined with the 2009 trip ends in all modelled zones, apart from those in the borough of Reigate & Banstead. The 2009 trip ends in the modelled zones of the borough of Reigate & Banstead were combined with the 2009 to 2026 'background growth' growth factors only. All trips in the 2026 Do-Minimum matrix were applied using the furness method.

7.1.4   The creation of a 2026 Do-Minimum allows a comparison to be made to the 2009 base, which can illustrate the impact of growth in traffic from the 'Rest of Britain,' while growth within the borough is constrained to represent background growth only.

7.1.5   The ratio difference in trips, in the borough of Reigate & Banstead between the 2009 base matrix and the 2026 Do-Minimum matrix is 0.999 for origin trips and 1.028 for destination trips. This is a minimal amount and justifies the reasoning for deciding not to include background growth in the trip rates extracted from the TRICS database for the 2009 to 2026 planning data.

7.1.6   *Figure 7.1* shows a diagrammatic view of the trip ends incorporated in the resulting 2026 Do-Minimum matrix.

Key
2026 Background Growth
2026 Full Development

Rest of Britain trip ends contain 2026 'full development'. Trip ends created by sourcing 2009 to 2026 'full development' growth factors from TEMPRO and applying to 2009 trip ends.

Rest of Britain

StudyArea

Study area trip ends contain 2026 'background growth'. Trips ends created by sourcing 2009 to 2026 'background growth' growth factors from TEMRO and applying to 2009 trip ends.

Figure 7.1: Diagram showing trip ends incorporated in 2026 Do-Minimum matrix

7.2   2026 Development Scenario Forecasts

7.2.1   The 2026 development scenario matrices (scenarios 1a, 1b, 2 and 3) were created by using the 2026 Do-Minimum matrix and incrementally adding each development scenario planning data. Hence, the scenario 1a planning data was added to the 2026 Do-Minimum matrix, resulting in the scenario 1a matrix. This process was repeated again for the other scenarios but using the previous scenario matrix as the starting point.

7.2.2   The planning data for each forecast scenario were incorporated into the matrices using the 'growth factor method', based on a row then column balance (that ends on a row balance). Use of a row balance in the growth factor method was thought preferable to a column balance as departure trips can be assumed to be more reliable in the AM time period. A row balance causes additional departure trips (origins) to be applied accurately to the desired zones, whereas the additional arrival trips (destinations) will be applied in a more random fashion, with a purpose of balancing the column total to the row total, hence a row balance. Therefore the assessment is more reliable in terms of projected additional departure (origin) trips in the 2026 development scenario forecasts, as these trips have been incorporated with greater accuracy.

7.2.3   *Figure 7.2* outlines the procedure used to create scenario 1a. It is important to note that the same process shown in *Figure 7.2* was used to create scenarios 1b, 2 and 3 but using scenario 1a, then scenario 1b and then scenario 2 matrix as the starting point. (See Appendix D for similar diagrams but for scenarios 1b, 2 and 3).

A

2026_R&B_Do-Minimum

Lumpy matrix in terms of distribution but validates well.

Taken from 2009_syn_vehC1K matrix and factored to 2026 but all trips in Reigate & Banstead only has 2009 – 2026 background growth.

B

2026_R&B_Smoothed~TLD

Copy of 2026_R&B_Do-Minimum.

Smooth all zones in Reigate & Banstead at once so averages the trip length distribution of all zones in the study area.

Trip distribution more representative but may not validate well.

C
2026_R&B_Smoothed_New1a_P

Create copy of 2026_R&B_Smoothed~TLD. Add the Scenario 1a trips that cause **positive growth only** to growth factor trip ends section of matrix. Will produce new 2026 trip ends following a smoothed distribution for **positive growth only**. Output of running job "Scenario_Matrix_growth_old" will create new matrix: 2026_R&B_Smoothed_New1a__P _growth.

E =A + Negative Trips
2026_R&B_New1a_N_growth

Copy 2026_R&B_Do-Minimum & rename to 2026_R&B_New1a_N. Add trip ends that cause **negative growth only** in Scenario 1a. Run the job "Scenario_Matrix_growth_old" using growth factor method. Will result in the negative trips being deducted from the lumpy matrix. Possible as know where deductions will occur.

D = C – B
2026_R&B_New Developments1a_P

Subtract the 2026_R&B_Smoothed~TLD matrix from the 2026_R&B_Smoothed_New1a_P _growth matrix. Will result in only the trip ends produced by new development causing **positive growth** from Scenario 1a left in matrix, but following smoothed distribution.

F = E + D
2026_R&B_Scenario1a

By combining the matrix containing the positive growth trips (2026_R&B_NewDevelopments1a_ P) and negative growth trips (2026_R&B_New1a_N_growth) allows all trips to be summed to generate the 2026_R&B_Scenario1a matrix. Will allow all development outside Reigate & Banstead to be distributed to allow validation but new development in Reigate & Banstead zones will follow a more representative distribution, but may not validate as well.

Jobs to use at each step of creating a forecast scenario are:

Step B: Smooth TLD
Step C / E: Scenario_Matrix_growth_old
Step D: Subtract_Matrices
Step E: Add_Matrices

Figure 7.2: Processes undertaken to create the forecast matrix for Scenario 1a

7.2.4   The trip ends in the Reigate & Banstead zones are smoothed in the 2026 Do-Minimum matrix to allow the new trip ends to follow a more representative distribution. Where significant land use changes occur between the existing and proposed land uses, the trip distribution pattern is not likely to remain representative. In order to account for this all additional trips generated from the planning data follows a smoothed distribution. A smoothed distribution refers to the origin and destination trip ends being averaged for a selected area (i.e. the borough of Reigate & Banstead).

7.2.5   The additional trips generated from Reigate & Banstead's 2009 to 2026 planning data follows this 'smoothed' distribution but has been added to the original 'raw' distribution of the SINTRAM model. The original 'raw' distribution tends to have less variation in terms of distribution, in individual zones, but validates well in terms of modelled flows replicating observed flows. Combining the two types of distribution enables a more robust forecast by allowing trips to be averaged over a selected area as the trip length changes accordingly.

7.2.6   Figure 7.3 shows a diagrammatic view of the trip ends incorporated in the resulting 2026 development scenario matrices.
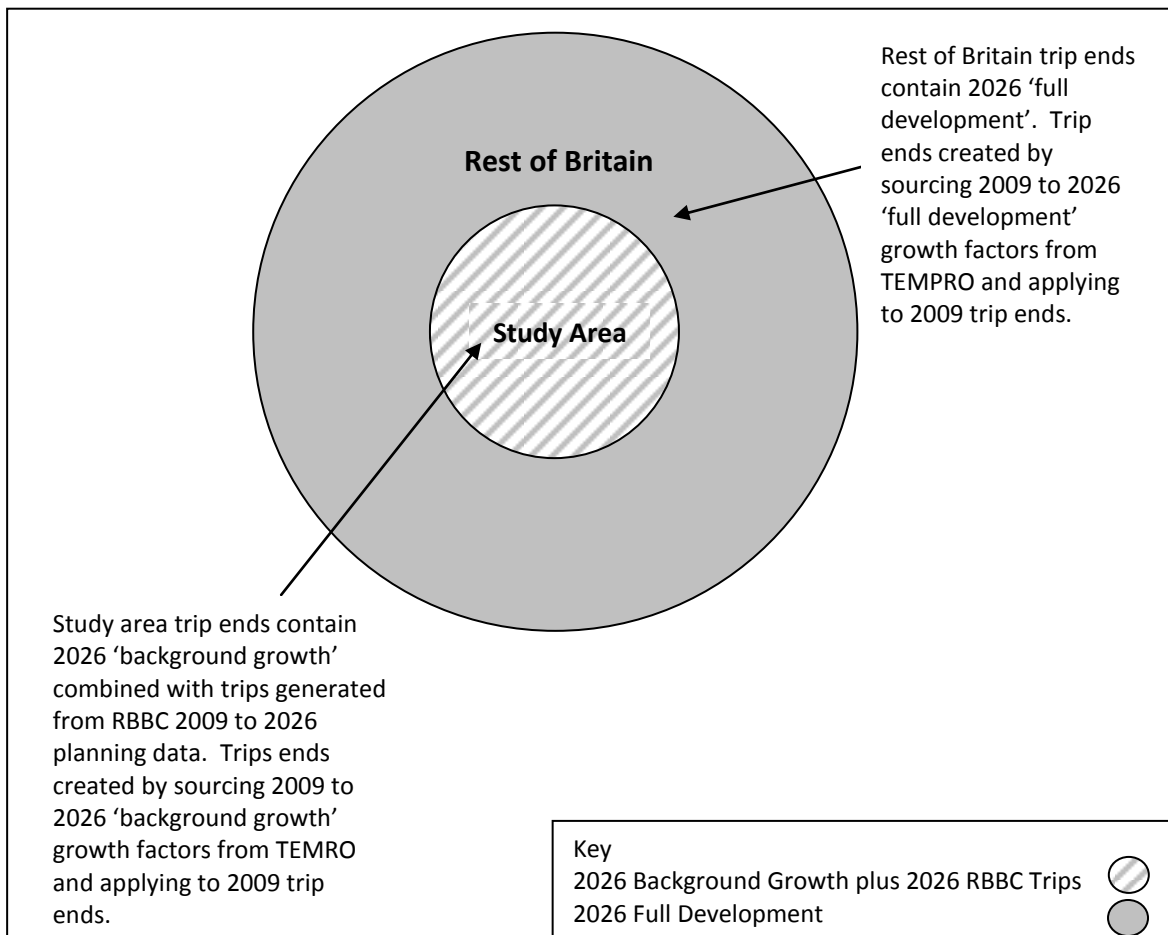
Figure 7.3: Diagram showing trip ends incorporated in the 2026 Development scenario matrices

7.2.7   Tables 7.1 to 7.2 shows the totals as well as absolute and percentage differences between the modelled 2009 base, 2026 Do-Minimum and 2026 development scenario matrices.

7.2.8   Table 7.1 shows a small reduction in borough internal trips between the 2026 Do-Minimum and 2009 base. This is explained by some zones in the borough being forecast a reduction in trips by TEMPRO, specifically Car 'background growth' growth factors. For example the average 'background growth' growth factor for origin Car trips was 0.996 (a minimal reduction) whereas destination car trips had a 'background growth' growth factor of 1.027 (a minimal increase). Due to the 2009 to 2026 background growth factors being incorporated into the matrix by use of the 'furness method', the matrix will have balanced by taking into account the reduction of Car origin trips, thus inferring that Car destination trips may have also incurred a small reduction in certain zones, to allow the matrix to balance.

Scenario	Borough Internal Trips	Absolute Difference (from base)	Percentage Difference (from base)	Matrix Total	Absolute Difference (from base)	Percentage Difference (from base)
2009 Base	12,795			5,757,127		
2026 Do-Minimum	12,535	-260	-2.0%	6,657,899	900,772	15.6%
2026 Scenario 1a	12,887	92	0.7%	6,658,513	901,386	15.7%
2026 Scenario 1b	14,246	1,451	11.3%	6,660,737	903,610	15.7%
2026 Scenario 2	15,012	2,217	17.3%	6,662,021	904,894	15.7%
2026 Scenario 3	15,291	2,496	19.5%	6,662,477	905,350	15.7%

Table 7.1: Average AM Peak Period (0700 – 1000) Matrix Totals

Vehicle Trips	2009 Base	2026 Do-Minimum	2026 Scenario 1a	2026 Scenario 1b	2026 Scenario 2	2026 Scenario 3
RBBC Intra Borough Trips	12,795	20,668	21,223	23,102	24,148	24,553
External to Borough Trips	9,919	10,817	10,881	11,232	11,474	11,524
Borough to External Trips	7,898	8,133	8,336	8,856	9,136	9,262

Table 7.2: Average AM Peak Period (0700 – 1000) Borough Matrix Totals

7.2.9   Tables 7.3 to 7.8 show the aggregated matrices for each modelled scenario, representing all modelled vehicles. The matrices have been aggregated into seven sectors covering geographic areas of Surrey, neighbouring counties and other areas of the country.

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	12,795	2,075	456	2,991	2,083	137	156	20,693
East Surrey	2,162	30,869	4,378	6,544	2,331	1,535	1,793	49,612
West Surrey	816	4,126	61,763	6,025	1,366	11,410	482	85,989
London	3,447	9,781	7,488	594,510	20,443	18,952	8,354	662,974
Kent / Sussex	3,124	5,497	2,974	20,062	300,451	9,472	6,248	347,828
Home Counties	204	598	11,026	64,871	2,406	502,099	109,051	690,255
Rest of Britain	166	659	803	63,212	9,341	248,182	3,577,413	3,899,775
{All}	22,714	53,605	88,888	758,214	338,421	791,788	3,703,497	**5,757,127**

Table 7.3: 2009 Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 12,795
External to Borough Trips = 22,714 – 12,795 = 9,919
Borough to External Trips = 20,693 – 12,795 = 7,898
Total = 5,757,127

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	12,535	2,302	497	2,929	2,133	128	144	20,668
East Surrey	2,218	35,717	4,939	6,879	2,462	1,604	1,805	55,625
West Surrey	844	4,734	70,203	6,370	1,493	12,649	496	96,787
London	3,832	12,461	9,022	715,246	26,335	23,025	11,367	801,288
Kent / Sussex	3,510	6,829	3,543	22,083	353,908	10,681	7,398	407,952
Home Counties	225	738	12,881	72,072	2,955	582,236	129,035	800,143
Rest of Britain	188	859	1,020	71,150	11,576	288,994	4,101,648	4,475,436
{All}	23,352	63,640	102,105	896,729	400,863	919,317	4,251,893	**6,657,899**

Table 7.4: 2026 Do-Minimum Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 12,535
External to Borough Trips = 23,352 – 12,535 = 10,817
Borough to External Trips = 20,668 – 12,535 = 8,133
Total = 6,657,899

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	12,887	2,359	510	3,001	2,186	131	148	21,223
East Surrey	2,229	35,717	4,939	6,879	2,462	1,604	1,805	55,635
West Surrey	848	4,734	70,203	6,370	1,493	12,649	496	96,791
London	3,852	12,461	9,022	715,245	26,335	23,025	11,367	801,307
Kent / Sussex	3,536	6,829	3,543	22,083	353,908	10,681	7,398	407,978
Home Counties	227	738	12,881	72,071	2,955	582,236	129,035	800,144
Rest of Britain	189	859	1,020	71,150	11,576	288,993	4,101,647	4,475,435
{All}	23,768	63,697	102,117	896,800	400,916	919,319	4,251,895	**6,658,513**

Table 7.5: 2026 Scenario 1a Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 12,887
External to Borough Trips = 23,768 – 12,887 = 10,881
Borough to External Trips = 21,223 – 12,887 = 8,336
Total = 6,658,513

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	14,246	2,499	545	3,192	2,321	140	158	23,102
East Surrey	2,300	35,717	4,939	6,879	2,462	1,604	1,805	55,707
West Surrey	880	4,734	70,203	6,370	1,493	12,649	496	96,824
London	3,973	12,461	9,022	715,244	26,335	23,025	11,367	801,427
Kent / Sussex	3,687	6,829	3,543	22,083	353,907	10,681	7,398	408,128
Home Counties	193	738	12,881	72,071	2,955	582,235	129,035	800,109
Rest of Britain	198	859	1,020	71,150	11,576	288,993	4,101,645	4,475,441
{All}	25,478	63,837	102,152	896,990	401,051	919,327	4,251,903	**6,660,737**

Table 7.6: 2026 Scenario 1b Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 14,246
External to Borough Trips = 25,478 – 14,246 = 11,232
Borough to External Trips = 23,102 – 14,246 = 8,856
Total = 6,660,737

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	15,012	2,579	563	3,293	2,392	145	164	24,148
East Surrey	2,350	35,717	4,939	6,879	2,462	1,604	1,805	55,756
West Surrey	900	4,734	70,202	6,370	1,493	12,649	496	96,843
London	4,059	12,461	9,022	715,244	26,335	23,025	11,367	801,512
Kent / Sussex	3,765	6,829	3,543	22,083	353,907	10,681	7,398	408,206
Home Counties	197	738	12,881	72,071	2,955	582,234	129,035	800,112
Rest of Britain	202	859	1,020	71,150	11,576	288,992	4,101,643	4,475,443
{All}	26,486	63,918	102,170	897,090	401,121	919,330	4,251,906	**6,662,021**

Table 7.7: 2026 Scenario 2 Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 15,012
External to Borough Trips = 26,486 – 15,012 = 11,474
Borough to External Trips = 24,148 – 15,012 = 9,136
Total = 6,662,021

	Reigate & Banstead	East Surrey	West Surrey	London	Kent / Sussex	Home Counties	Rest of Britain	{All}
Reigate & Banstead	15,291	2,615	571	3,338	2,424	147	166	24,553
East Surrey	2,360	35,717	4,939	6,879	2,462	1,604	1,805	55,767
West Surrey	904	4,734	70,202	6,370	1,493	12,649	496	96,848
London	4,077	12,461	9,022	715,244	26,335	23,025	11,367	801,530
Kent / Sussex	3,782	6,829	3,543	22,083	353,907	10,681	7,398	408,222
Home Counties	198	738	12,881	72,071	2,955	582,234	129,035	800,113
Rest of Britain	203	859	1,020	71,150	11,576	288,992	4,101,643	4,475,444
{All}	26,815	63,953	102,178	897,135	401,153	919,332	4,251,909	**6,662,477**

Table 7.8: 2026 Scenario 3 Aggregated Matrix Totals

Reigate & Banstead Intra Borough Trips = 15,291
External to Borough Trips = 26,815 – 15,291 = 11,524
Borough to External Trips = 24,553 – 15,291 = 9,262
Total = 6,662,477

APPENDICES

APPENDIX A – DMRB MERGE/DIVERGE GUIDELINES

Example of use of Figure 2/3MW
Given an upstream main line flow 4000vph and merge flow 2000vph.

1 strike a perpendicular from 4000vph on the horizontal axis
2 strike a perpendicular from 2000vph on the vertical axis
3 the intersection point gives layout type F which also requires a lane gain (see Downstream Mainline axis above)

Downstream Mainline
Lane 2
Lane 3
Lane 4
Lane 5

Merge Flow VPH

3500
3000
2500
2000
1500
1000
500
0

Connector Road Lane 2
Connector Road Lane 1

G G
F F F
* * *
C C C
B E B E B E B
E
E
E
A or D   A or D   A or D   A or D

Upstream Mainline
Lane 1   Lane 2   Lane 3   Lane 4   Lane 5

Motorway

0   1000   2000   3000   4000   5000   6000   7000   8000   9000

Mainline Flow VPH

Notes:

* If Layout F Option 2 is used consider extended Auxiliary Lane (see paragraph 4.23).

\# Area of uncertainty – In this area the choice will depend on the downstream provision. If there is a lane gain then use Layout E or F.

See paragraph 2.29 and example above, for explanation of the usage of this diagram.

Figure 2/3 MW   Motorway Merging Diagram

Nose

(2) & (3)

Taper

(1)

Single Lane

A – Taper Merge

Nose

(2) & (3)

Auxiliary Lane

(4)

Taper

(5)

Single Lane

B – Parallel Merge

Overlap

50m

Nose

(2) & (3)

Taper
(Slip Road Right
Hand Lane)

(1)

Ghost Island Tail

(6)

Taper

(1)

ghost island width 2m min.
at widest point
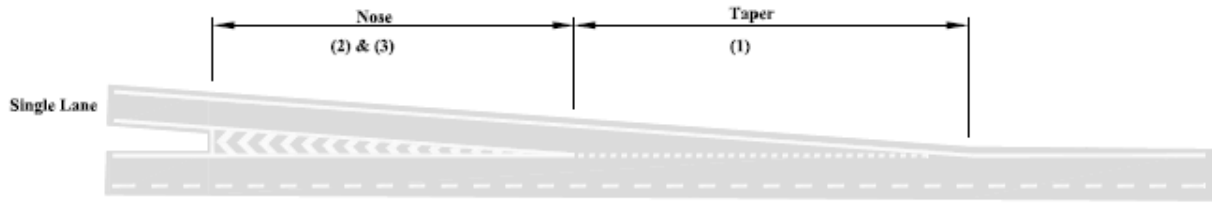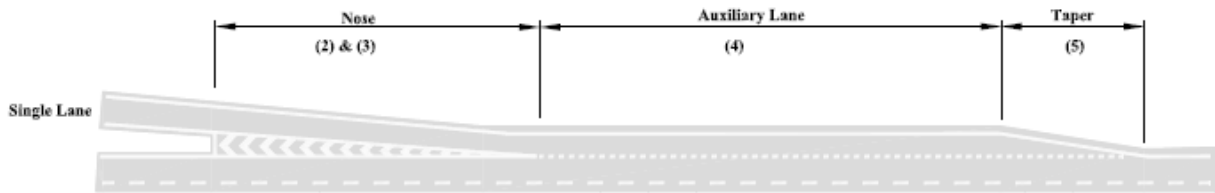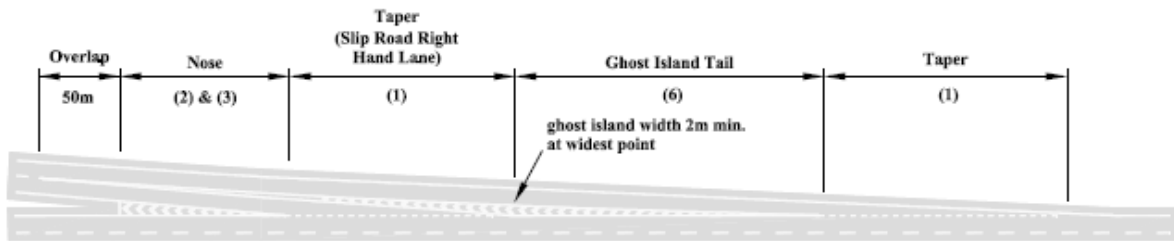
C – Ghost Island Merge
(Only used where design flows on mainline are light, there are 3 lanes or more on mainline
and merging flow is over one lane capacity, see paragraph 2.30).

Nose

(2) & (3)
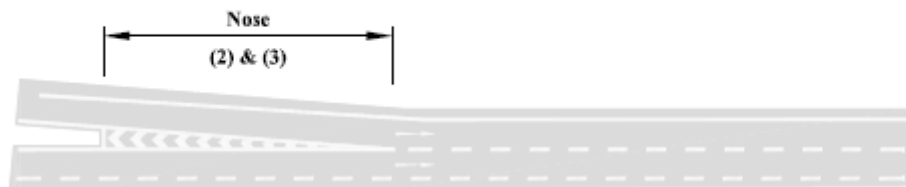
E – Lane Gain
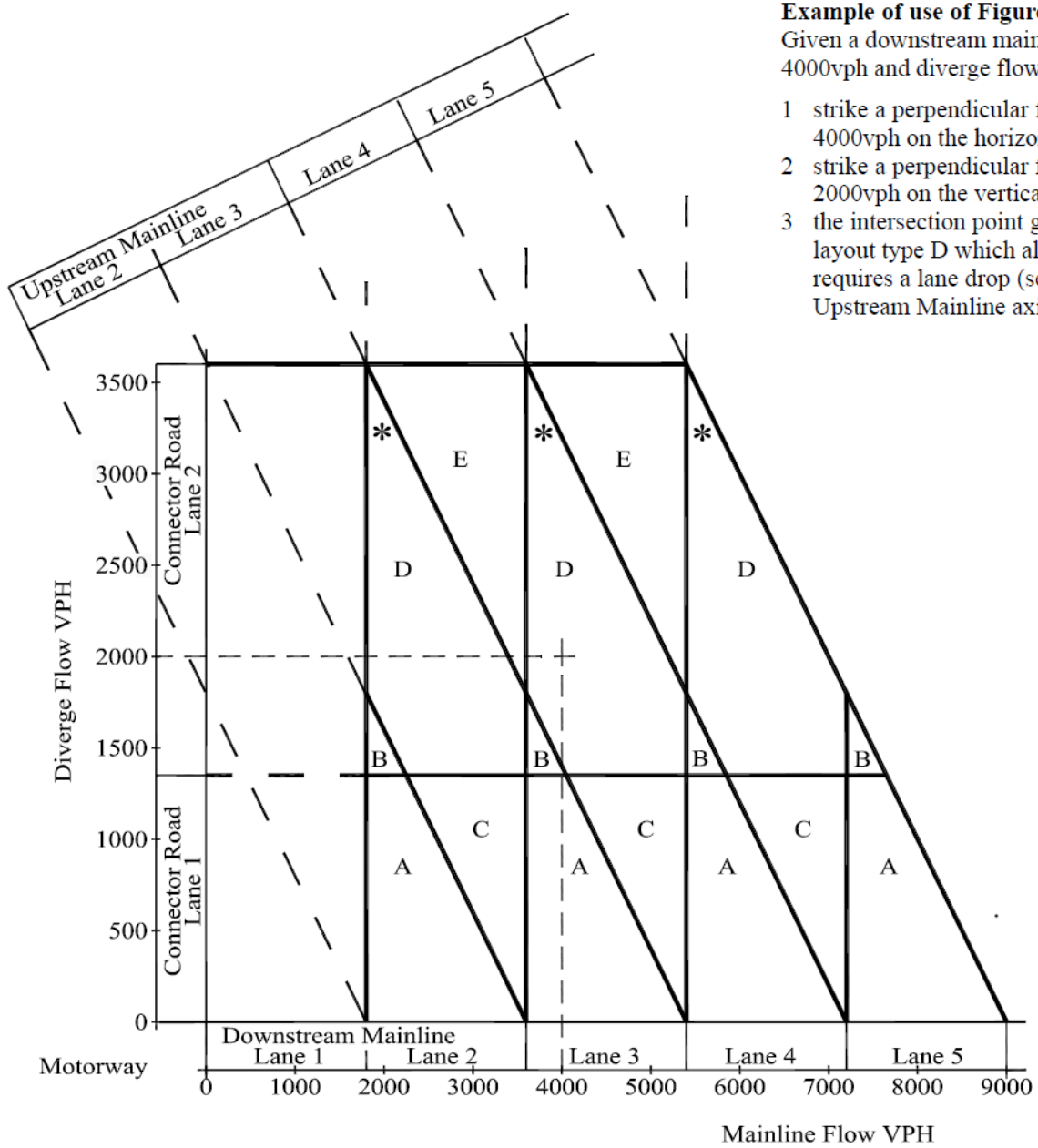
Example of use of Figure
Given a downstream main l
4000vph and diverge flow 2

1 strike a perpendicular fr
   4000vph on the horizont
2 strike a perpendicular fr
   2000vph on the vertical
3 the intersection point giv
   layout type D which also
   requires a lane drop (see
   Upstream Mainline axis

Notes:

* If Layout D Option 2 is used consider extended Auxiliary Lane (see paragraph 4.24).

   See paragraph 2.43 and the example above, for explanation of the usage of this diagram.

Figure 2/5 MW   Motorway Diverging Diagram

Taper

(1) or (2)

Nose

(3) & (4)

Radius
approx
1000m

1 or 2 lanes

A – Taper Diverge

Taper

(1)

Radius
approx
1000m

Nose

(3) & (4)

Radius
approx
1000m
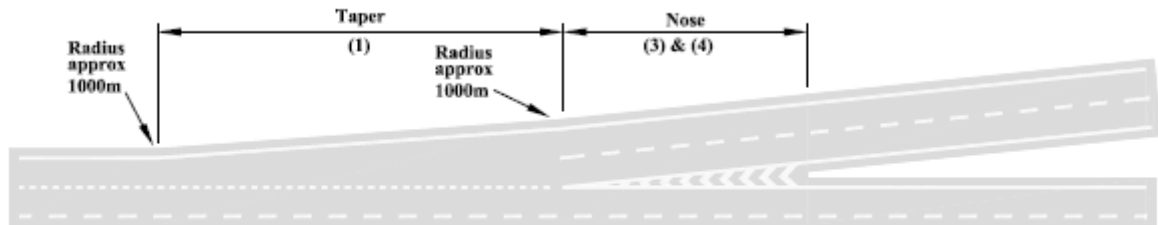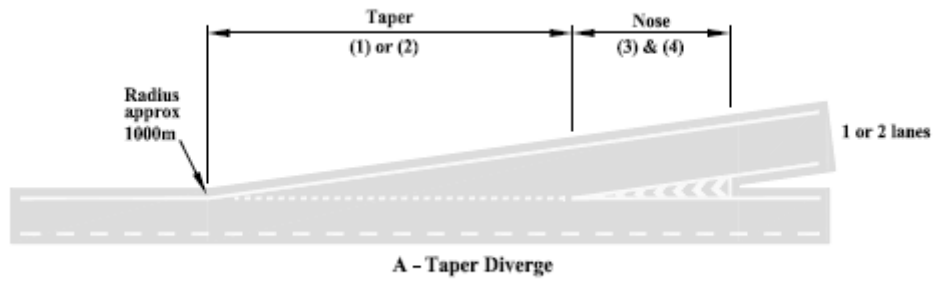
The edge line must be laid to the radii indicated

C – Lane Drop at Taper Diverge

Taper

(6)

Radius approx 1000m

Auxiliary Lane

(5)

Radius
approx
1000m

Nose

(3) & (4)

Radius
approx
1000m
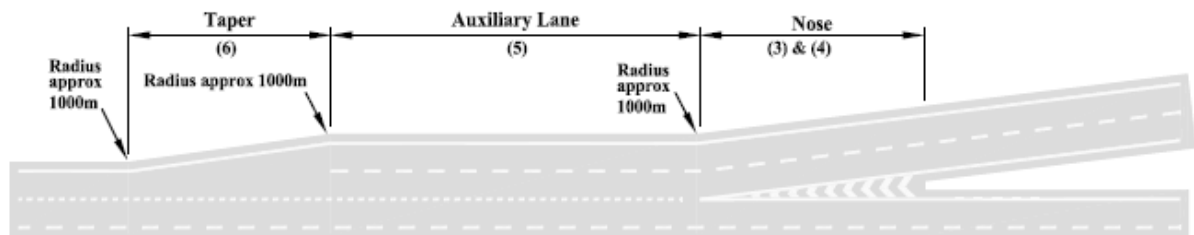
D (Option 2 Not Preferred) – Lane Drop at Parallel Diverge
See paragraph 2.49

M25 J8 EXSTING LAYOUT
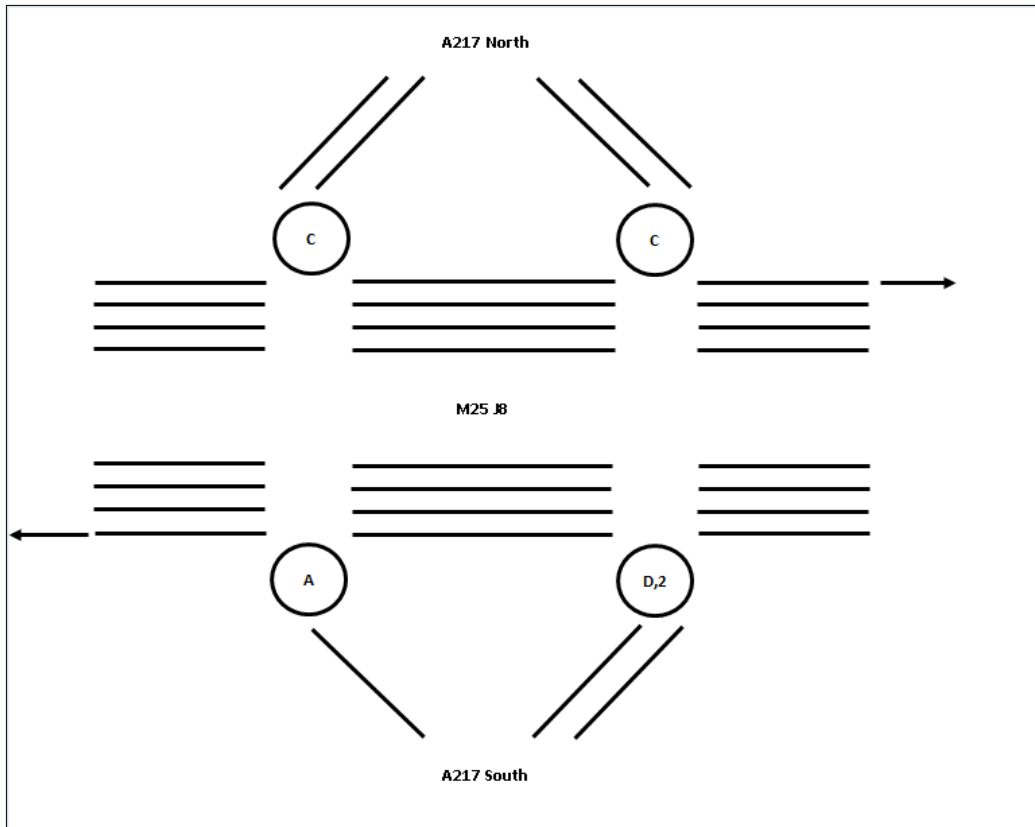
M25 J8 2009 LAYOUT
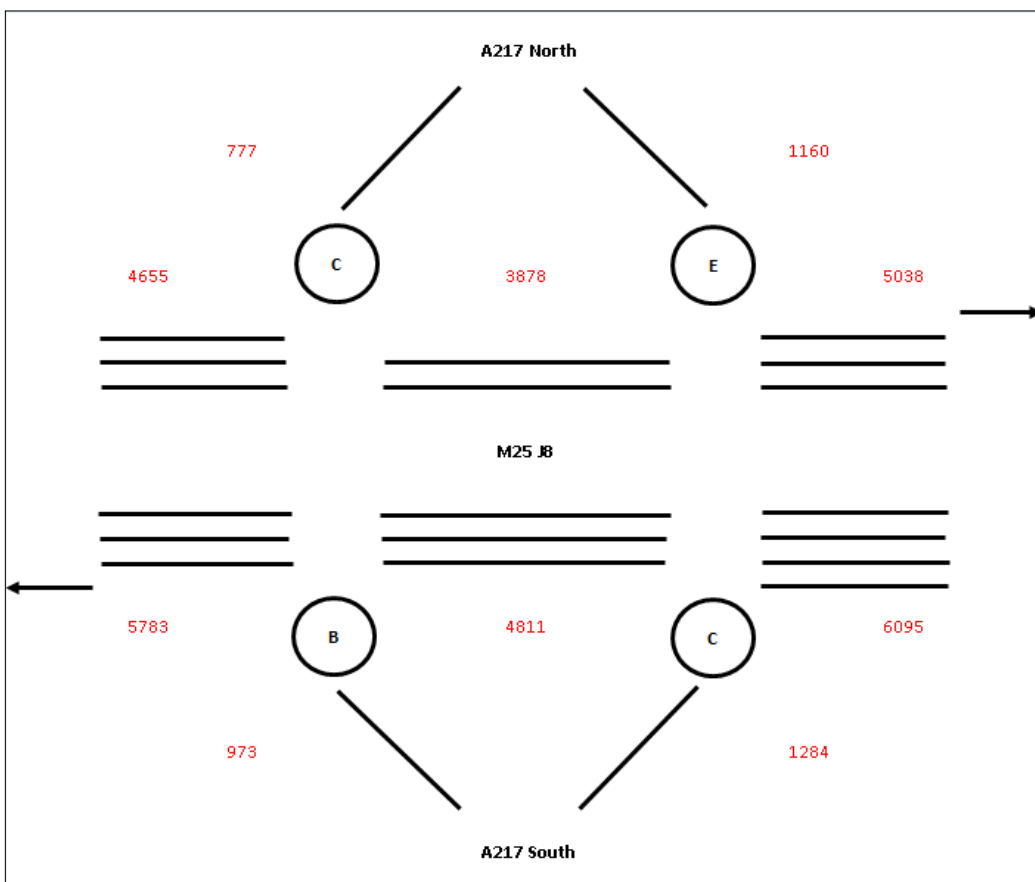
M25 J8 2026 DO-MINIMUM LAYOUT
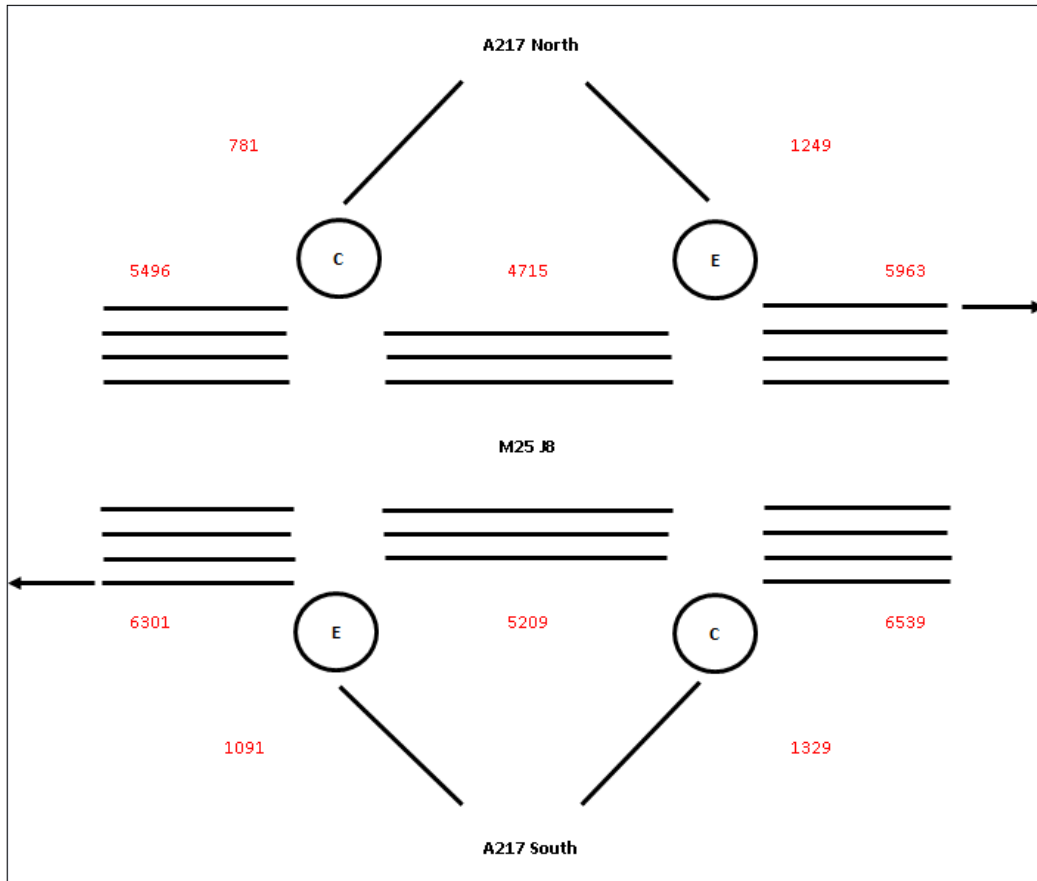
M25 J8 SCENARIO 1A LAYOUT
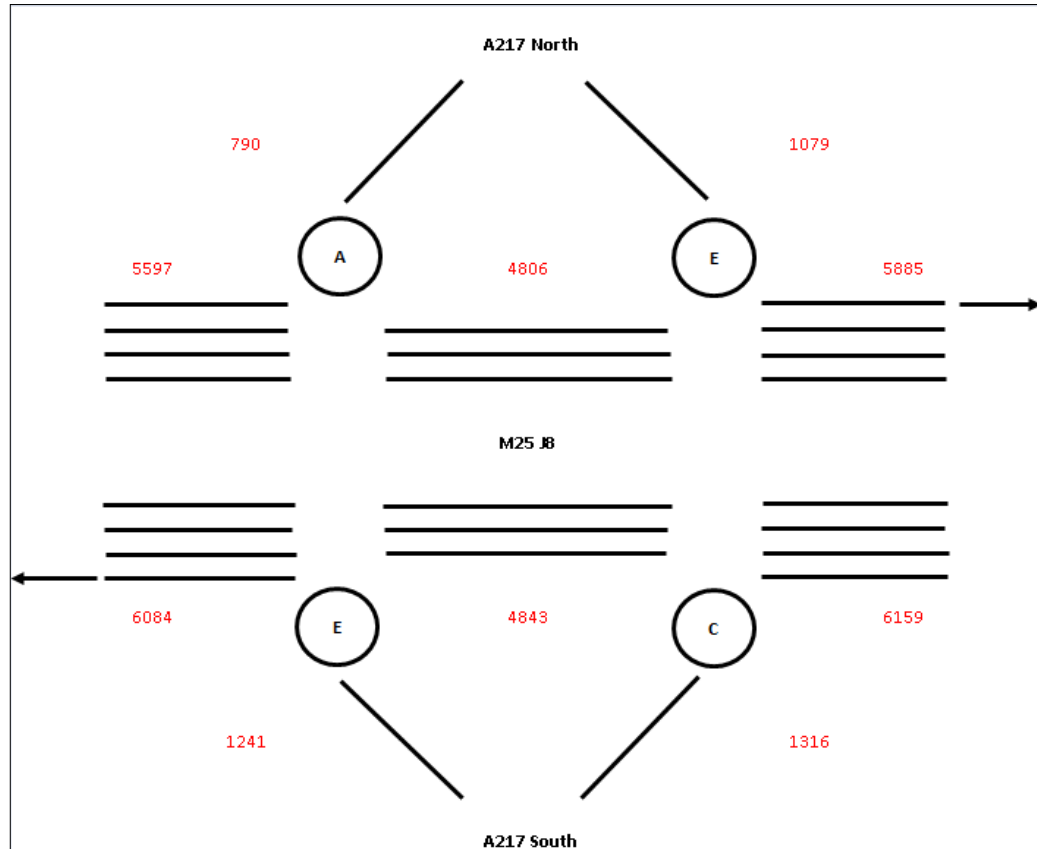
M25 J8 SCENARIO 1B LAYOUT
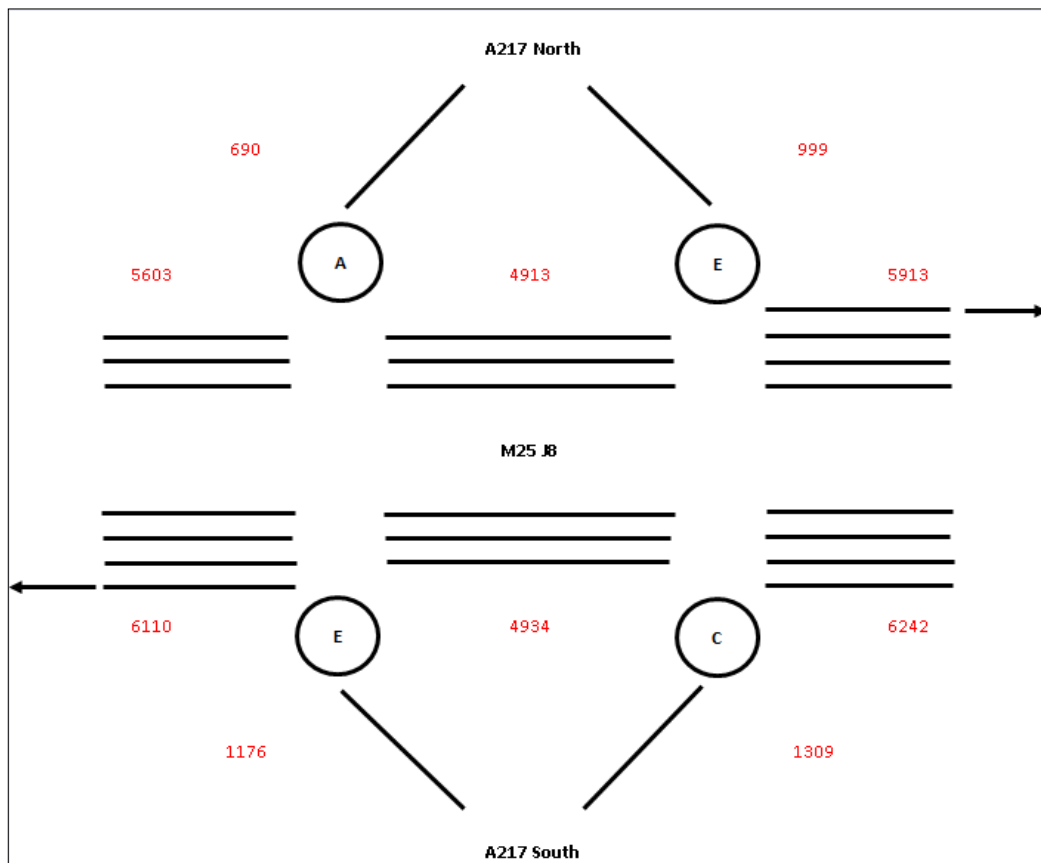
M25 J8 SCENARIO 2 LAYOUT
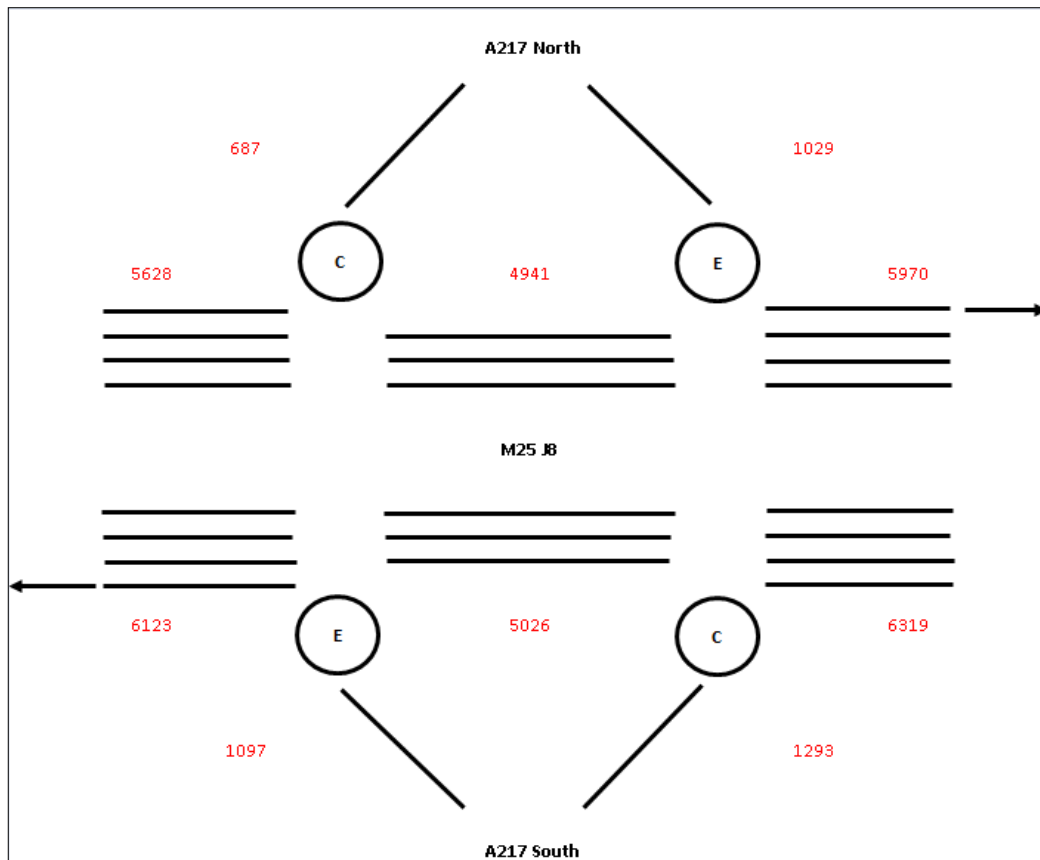
M25 J8 SCENARIO 3 LAYOUT
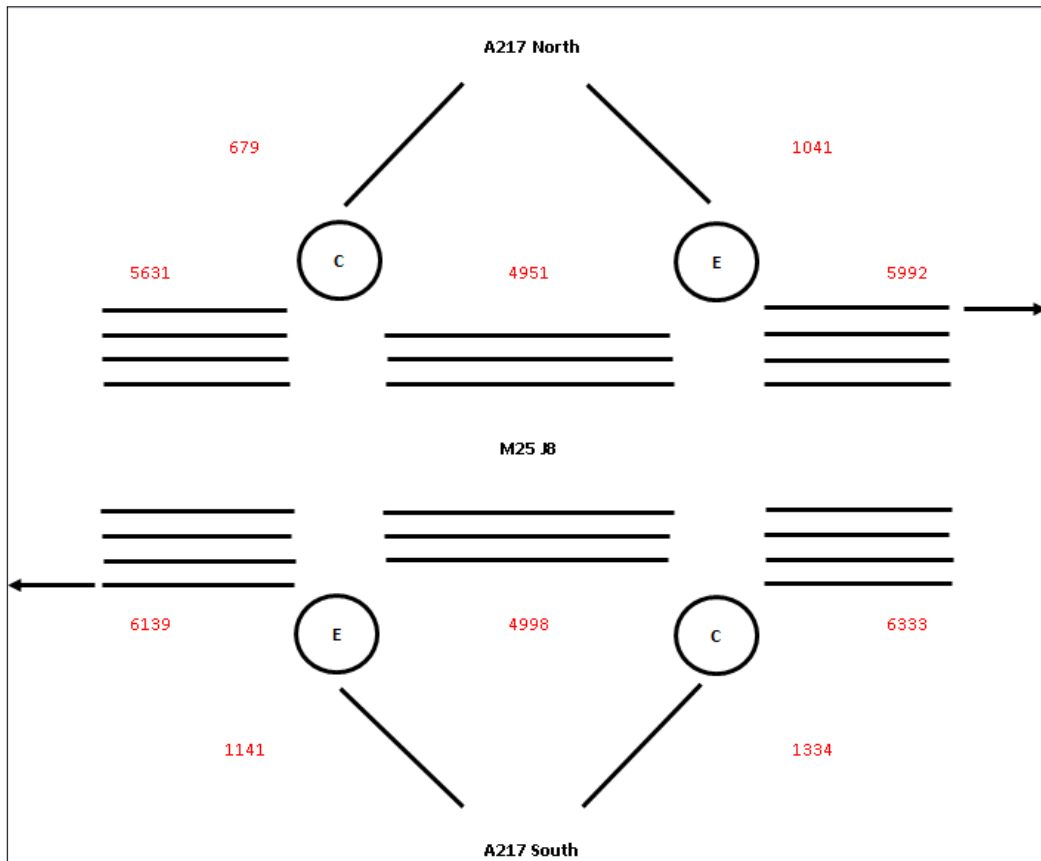
APPENDIX C – TRICS LOCATIONS DEFINITIONS

(Source: TRICS database 2010 (a) V6.5.1 Dec 2009)

Town Centre
Within the central core area of the heart of the town/city (e.g. the primary shopping area), as defined in the local development (if appropriate).

Edge of Town Centre
For retail, a location within easy walking distance (i.e. up to 300 metres) from the central primary shopping area, often providing parking facilities that serve the centre as well as the site, thus enabling one trip to serve several purposes. For other uses, the edge-of-centre radius from the town/city may be more extensive, based on how far people would be prepared to walk. For offices this may be outside the town centre but in the urban area within 500 metres of a public transport interchange. Local topography and barriers will affect pedestrians' perception of easy walking distance. Examples of barriers include crossing major roads and car parks. The perceived safety of the route and strength of the attraction of the town centre are also relevant.

Neighbourhood Centre
Predominantly residential area, but with additional amenities like local shops, schools etc. Could be described as a small "district" or "village" within the town/city itself. Would also apply to actual villages. The local shops serve a small catchment. These may include a general grocery store, a newsagent, a sub-post office and pharmacy, as well as others. These centres provide accessible shopping for people's day-to-day needs.

Suburban Area
An area outside the edge of the town/city centre, but not at the town/city's physical edge. This can encompass a wide range of physical locations within a town/city. Suburban Area sites can range from busy built up areas near the centre of town (but outside the Edge of Town Centre radius), to leafy suburbs far from the centre.

Edge of Town
At the physical edge of the town/city, where the town/city meets the countryside. The actual physical distance from the site to the beginning of the countryside can vary proportionately to the size of the town/city.

Free Standing (Out of Town)
Just beyond the physical edge of the nearest town/city, or in an isolated rural location (sites in villages within the Neighbourhood Centre category). The distance from the edge of the town/city, which qualifies a site as Free Standing, is not set, and is instead judged on a site-by-site basis, proportional to the size of the town/city.

APPENDIX D – FORECAST MATRIX METHODOLOGY – SCENARIO 1B

A

2026_R&B_Scenario1a

Lumpy matrix in terms of distribution but validates well.

Scenario 1a trips added but these additional trips follow a smooth distribution.

B

2026_R&B_Smoothed1a~TLD

Copy of 2026_R&B_Scenario1a.

Smooth all zones in Reigate & Banstead at once so averages the trip length distribution of all zones in the study area.

Trip distribution more representative but may not validate well.

C

2026_R&B_Smoothed1a_New1a_P

Create copy of 2026_R&B_Smoothed1a~TLD.
Add the Scenario 1b trips that cause **positive growth only** to growth factor trip ends section of matrix.
Will produce new 2026 trip ends following a smoothed distribution for **positive growth only**. Output of running job "Scenario_Matrix_growth_old" will create new matrix: 2026_R&B_Smoothed1a_New1b

E =A + Negative Trips
2026_R&B_New1b_N_growth

Copy 2026_R&B_Scenario1a & rename to 2026_R&B_New1b_N. Add trip ends that cause **negative growth only** in Scenario 1b.
Run the job "Scenario_Matrix_growth_old" using growth factor method. Will result in the negative trips being deducted from the lumpy matrix. Possible as know where deductions will occur.

D = C – B
2026_R&B_New Developments1b_P

Subtract the 2026_R&B_Smoothed1a~TLD matrix from the 2026_R&B_Smoothed1a_New1b _P_growth matrix.
Will result in only the trip ends produced by new development causing **positive growth** from Scenario 1b left in matrix, but following smoothed distribution.

F = E + D
2026_R&B_Scenario1b

By combining the matrix containing the positive growth trips (2026_R&B_NewDevelopments1b_ P) and negative growth trips (2026_R&B_New1b_N_growth) allows all trips to be summed to generate the 2026_R&B_Scenario1b matrix.
Will allow all development outside Reigate & Banstead to be distributed to allow validation but new development in Reigate & Banstead zones will follow a more representative distribution, but may not validate as well.

Jobs to use at each step of creating a forecast scenario are:

Step B: Smooth TLD
Step C / E: Scenario_Matrix_growth_old
Step D: Subtract_Matrices
Step E: Add_Matrices

FORECAST MATRIX METHODOLOGY – SCENARIO 2

C
2026_R&B_Smoothed1b_New2_P

Create copy of 2026_R&B_Smoothed1b~TLD.
Add the Scenario 2 trips that cause **positive growth only** to growth factor trip ends section of matrix.
Will produce new 2026 trip ends following a smoothed distribution for **positive growth only**. Output of running job "Scenario_Matrix_growth_old" will create new matrix: 2026_R&B_Smoothed1b_New2_

B
2026_R&B_Smoothed1b~TLD

Copy of 2026_R&B_Scenario1b.

Smooth all zones in Reigate & Banstead at once so averages the trip length distribution of all zones in the study area.

Trip distribution more representative but may not validate well.

A
2026_R&B_Scenario1b

Lumpy matrix in terms of distribution but validates well.

Scenario 1b trips added but these additional trips follow a smooth distribution.

E =A + Negative Trips
2026_R&B_New2_N_growth

Copy 2026_R&B_Scenario1b & rename to 2026_R&B_New2_N. Add trip ends that cause **negative growth only** in Scenario 2.
Run the job "Scenario_Matrix_growth_old" using growth factor method. Will result in the negative trips being deducted from the lumpy matrix. Possible as know where deductions will occur.

D = C – B
2026_R&B_New Developments2_P

Subtract the 2026_R&B_Smoothed1b~TLD matrix from the 2026_R&B_Smoothed1b_New2_P_growth matrix.
Will result in only the trip ends produced by new development causing **positive growth** from Scenario 2 left in matrix, but following smoothed distribution.

F = E + D
2026_R&B_Scenario2

By combining the matrix containing the positive growth trips (2026_R&B_NewDevelopments2_P) and negative growth trips (2026_R&B_New2_N_growth) allows all trips to be summed to generate the 2026_R&B_Scenario2 matrix.
Will allow all development outside Reigate & Banstead to be distributed to allow validation but new development in Reigate & Banstead zones will follow a more representative distribution, but may not validate as well.

Jobs to use at each step of creating a forecast scenario are:

Step B: Smooth TLD
Step C / E: Scenario_Matrix_growth_old
Step D: Subtract Matrices
Step E: Add Matrices

FORECAST MATRIX METHODOLOGY – SCENARIO 3

A

2026_R&B_Scenario2

Lumpy matrix in terms of distribution but validates well.

Scenario 2 trips added but these additional trips follow a smooth distribution.

B

2026_R&B_Smoothed2~TLD

Copy of 2026_R&B_Scenario2.

Smooth all zones in Reigate & Banstead at once so averages the trip length distribution of all zones in the study area.

Trip distribution more representative but may not validate well.

C
2026_R&B_Smoothed2_New3_P

Create copy of 2026_R&B_Smoothed2~TLD.
Add the Scenario 3 trips that cause **positive growth only** to growth factor trip ends section of matrix.
Will produce new 2026 trip ends following a smoothed distribution for **positive growth only**. __P_growth. Output of running job "Scenario_Matrix_growth_old" will create new matrix: 2026_R&B_Smoothed2_New3

E =A + Negative Trips
2026_R&B_New3_N_growth

Copy 2026_R&B_Scenario2 & rename to 2026_R&B_New3_N. Add trip ends that cause **negative growth only** in Scenario 3.
Run the job "Scenario_Matrix_growth_old" using growth factor method. Will result in the negative trips being deducted from the lumpy matrix. Possible as know where deductions will occur.

D = C – B
2026_R&B_New Developments3_P

Subtract the 2026_R&B_Smoothed2~TLD matrix from the 2026_R&B_Smoothed2_New3_P _growth matrix.
Will result in only the trip ends produced by new development causing **positive growth** from Scenario 3 left in matrix, but following smoothed distribution.

F = E + D
2026_R&B_Scenario3

By combining the matrix containing the positive growth trips (2026_R&B_NewDevelopment3_P) and negative growth trips (2026_R&B_New3_N_growth) allows all trips to be summed to generate the 2026_R&B_Scenario3 matrix.
Will allow all development outside Reigate & Banstead to be distributed to allow validation but new development in Reigate & Banstead zones will follow a more representative distribution, but may not validate as well.

Jobs to use at each step of creating a forecast scenario are:

Step B: Smooth TLD
Step C / E: Scenario_Matrix_growth_old
Step D: Subtract Matrices
Step E: Add Matrices