Sevenoaks Local Plan

Forecast Baseline Report

June 2026

Sevenoaks District Council

SDC

Document history and status

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Sevenoaks Local Plan

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Contents

Appendix A – List of Committed Developments in Sevenoaks

Limitation Statement

The sole purpose of this technical report is to describe the processes by which 2042 demand forecasts have been carried out using the Sevenoaks Local Transport Model. It should be noted that this report has been prepared for use of Sevenoaks District Council (SDC). This report should be read in full with no excerpts out of context deemed to be representative of the report and its findings as a whole. This report has been prepared exclusively for Jacobs and Jacobs' end client (SDC) and no liability is accepted for any use or reliance on the report by third parties.

Several of the figures within this report have been generated in the PTV VISUM software using OpenStreetMap® open source data, licensed under the Open Data Commons Open Database License (ODbL) by the OpenStreetMap Foundation (OSMF). The data is available under the ODbL. For more information see:

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1. Introduction

1.1 Background

Sevenoaks District Council (SDC) is undertaking a Local Plan Review (LPR) for the district to address the latest Government standard methodology for calculating authorities' future housing numbers and extend the Plan period to at least 2042.

The current Sevenoaks District Core Strategy was adopted in 2011 and provides for the housing, employment and retail development needed for 2011-2026. The annual housing requirement will increase from the current Local Plan figure to up to approximately 1,164 homes/year from 2027 to 2042.

SDC needs to consider, and consult on, reasonable, alternative options for meeting housing and other development needs. As part of this process, SDC commissioned Jacobs to undertake transport modelling to gather evidence on the transport implications of the emerging draft LPR options.

The overall project objectives are to:

1. Assess the quality and capacity of transport infrastructure across the district and its ability to meet forecast demands – this can be developed through the traffic modelling proposed here.
2. Assess the cumulative impacts of the LP development options on the district's transport network – this can be developed through the traffic modelling proposed here.
3. Identify proposals and potential measures to mitigate the impacts of development to inform the infrastructure requirements associated with the LP. This should include, but is not limited to:
    a. Identification of potential measures to enable and achieve higher levels of sustainable transport mode share across the district.
    b. Identification of the potential barriers to the utilisation of sustainable transport modes across the district.
    c. Identification of potential intervention measures on the transport network

The Sevenoaks Local Transport Model has been checked and enhanced using available data to prepare it for developing forecast scenarios and undertaking spatial assessments. More information can be found in the local base model report[1].

1.2 Purpose of this Document

This Forecast Report describes the principles, assumptions and methodology employed to develop the future year baseline situation using the Sevenoaks Local Transport Model. The forecast baseline has been developed for a single forecast year of 2042, after the completion of the 2019 local base model. This includes a full identification of committed developments and transport schemes.

It should be noted that this report has been submitted as a draft and is subject to review by Kent County Council and National Highways. Revisions may be expected in the final version, depending on feedback received from both parties.

[1] Stage 2 Tonbridge and Malling and Sevenoaks - Local Model Validation Report v2.docx

1.3 Document Structure

Following this introduction, the structure of this report is as follows:

- **Chapter 2** – provides an overview of the proposed uses of the model and the key model design considerations;
- **Chapter 3** – provides an overview of the 2019 Local Transport Model
- **Chapter 4** - provides an overview of the network and demand forecasting approach;
- **Chapter 5** – presents the forecast results for the future year scenario;
- **Chapter 6** – provides a summary and recommendations

2. Overview of the Model and Key Model Design Considerations

2.1 Study Area

The Kent Transport Model (KTM) has been updated for the development of the Sevenoaks Local Transport Model. As in standard practice, should a model be required for a specific study within the detailed model area (such as a Local Plan review), then an additional review and updates will be needed to refine the validation in the local area. This enables additional focus on model quality in the specific area of interest.

Therefore, the Sevenoaks Local Transport Model network has been developed based on the 2019 KTM using PTV VISUM 2020 software (the same software that was used to develop the 2019 KTM) with necessary updates to check that the local network replicates base conditions. More information can be found in the local model validation report.

The highway assignment model represents a 'neutral' weekday in the following modelled time periods:

- AM peak hour (08:00 – 09:00); and
- PM peak hour (17:00 – 18:00)

These modelled hours were derived from the analysis of traffic counts throughout the study area to ascertain which hours contained the highest overall volume of traffic and the hours where the traffic volume was observed to be the highest at the majority of survey locations.

The 2019 base model was developed for both Sevenoaks District and Tonbridge and Malling Borough. Due to geographical proximity and the similarity of the scope of work, an agreement has been made for joint working. However, in developing the 2042 Forecast Baseline, separate models were prepared for Sevenoaks District and Tonbridge and Malling Borough.

Figure 2-1 shows the detailed model area where it includes Tonbridge and Malling Borough, Sevenoaks District and the key junctions outside their boundaries. The detailed model area is where the VISUM Intersection Capacity Assessment (ICA) has been implemented to capture delays generated at urban junctions. Figure 2-2 shows the locations of the junctions with ICA implemented. For areas outside the detailed model area, junctions were not modelled in detail, but delays were captured through network links. Adjustments to the KTM network, zoning and zone connectors were also applied to simplify the external network that did not impact the study area directly (e.g., in Thanet, Dover, rest of London, Surrey, East Sussex etc).

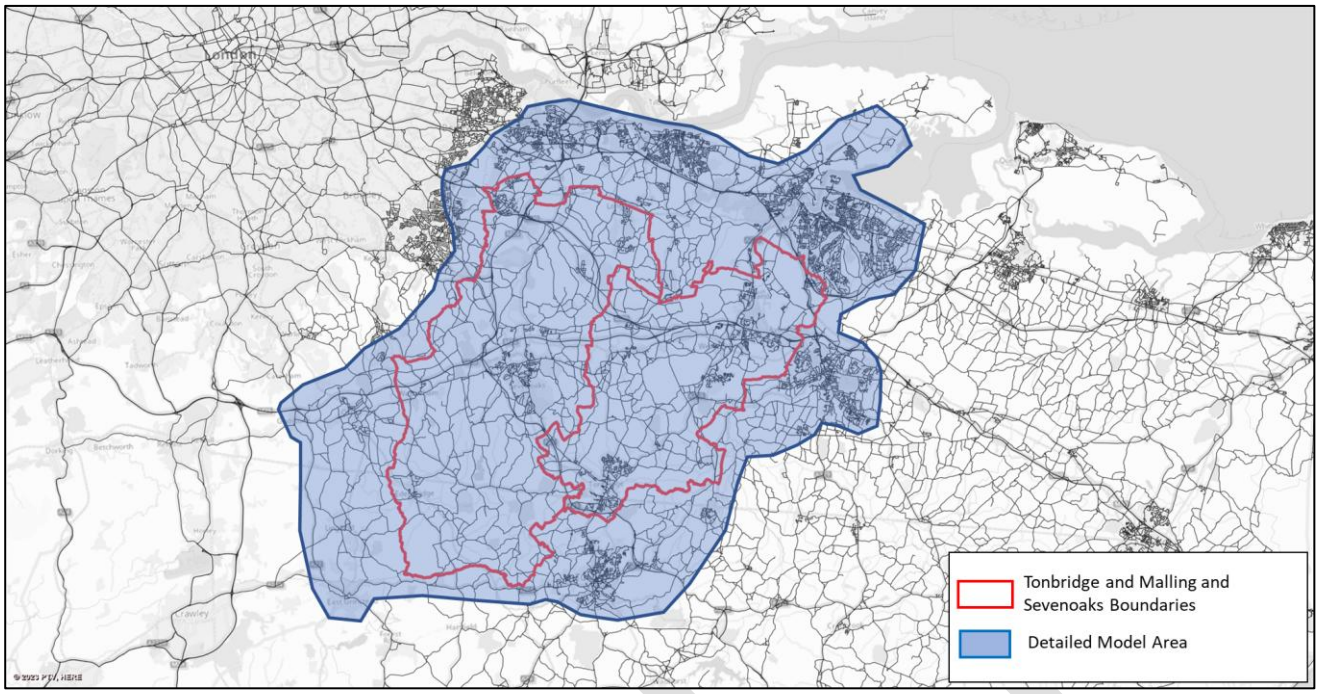

Figure 2-1: Sevenoaks and Tonbridge and Malling Local Model Study Area

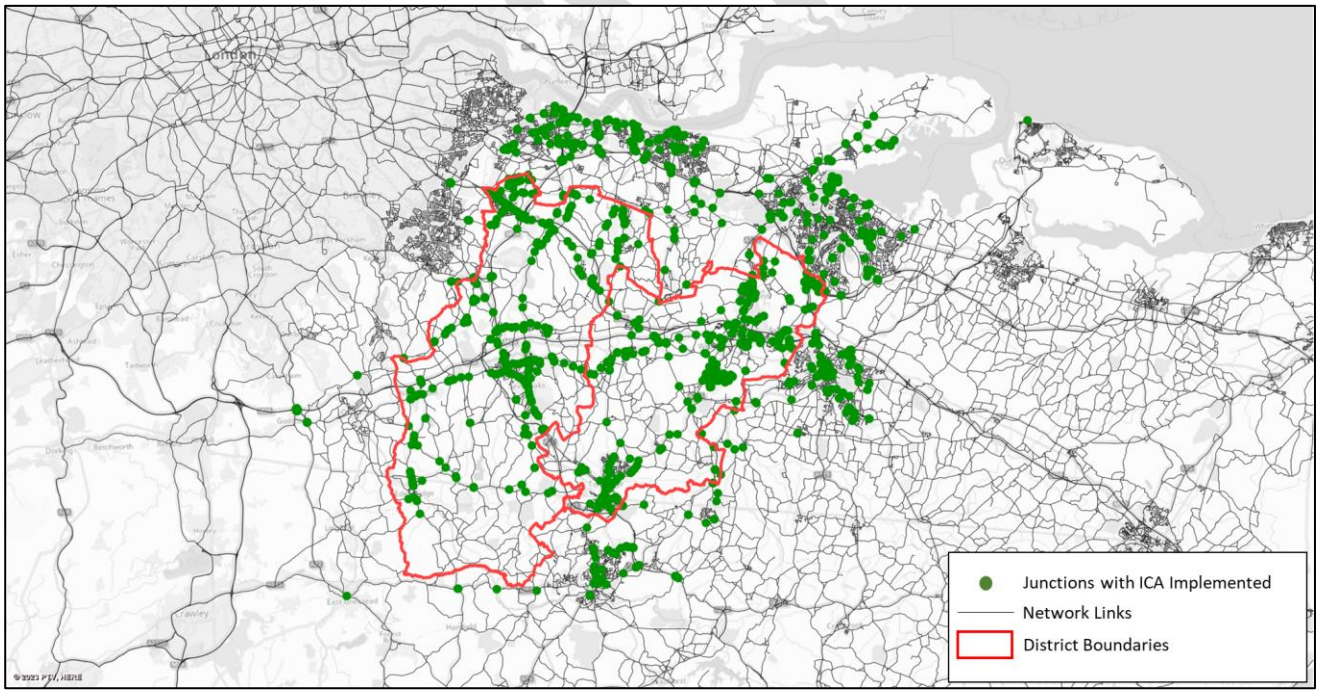

Figure 2-2: Junctions with Intersection Capacity Analysis (ICA) Method Implemented

2.2 2019 Base Year

The Department for Transport (DfT) published daily statistics on road traffic, rail passenger journeys, and bus travel since the start of the pandemic (March 2020). Figure 1 summarises the data, comparing traffic levels from March 2020 onwards with pre-COVID levels. Values below 100% indicate a decline in traffic, while values above 100% represent an increase. The data show a significant downturn in demand across all modes during periods of national lockdown after March 2020 and again in January 2021.

At Great Britain level, it also shows that highway demand from 2022 had returned to pre-pandemic levels, with LGV demand showing growth (green line); the graph also shows that car demand (red line) remained relatively constant throughout 2021 to 2026, with little growth or decline in comparison to pre-covid levels, or those shown when restrictions did not apply.

These trends do not undermine the validity or usefulness of a model set up on the basis of 2019 data (i.e The Kent Transport Model). As shown in Figure 1, whilst an increase in goods vehicle traffic is observed, car traffic—which represents the principal mode associated with local plan development demand—has remained broadly stable over the same period. Given that car-based trips constitute the dominant component of forecast demand and are the primary determinant of network performance in the assessment of development impacts, this observed stability provides confidence in the continued relevance of the model's underlying assumptions.

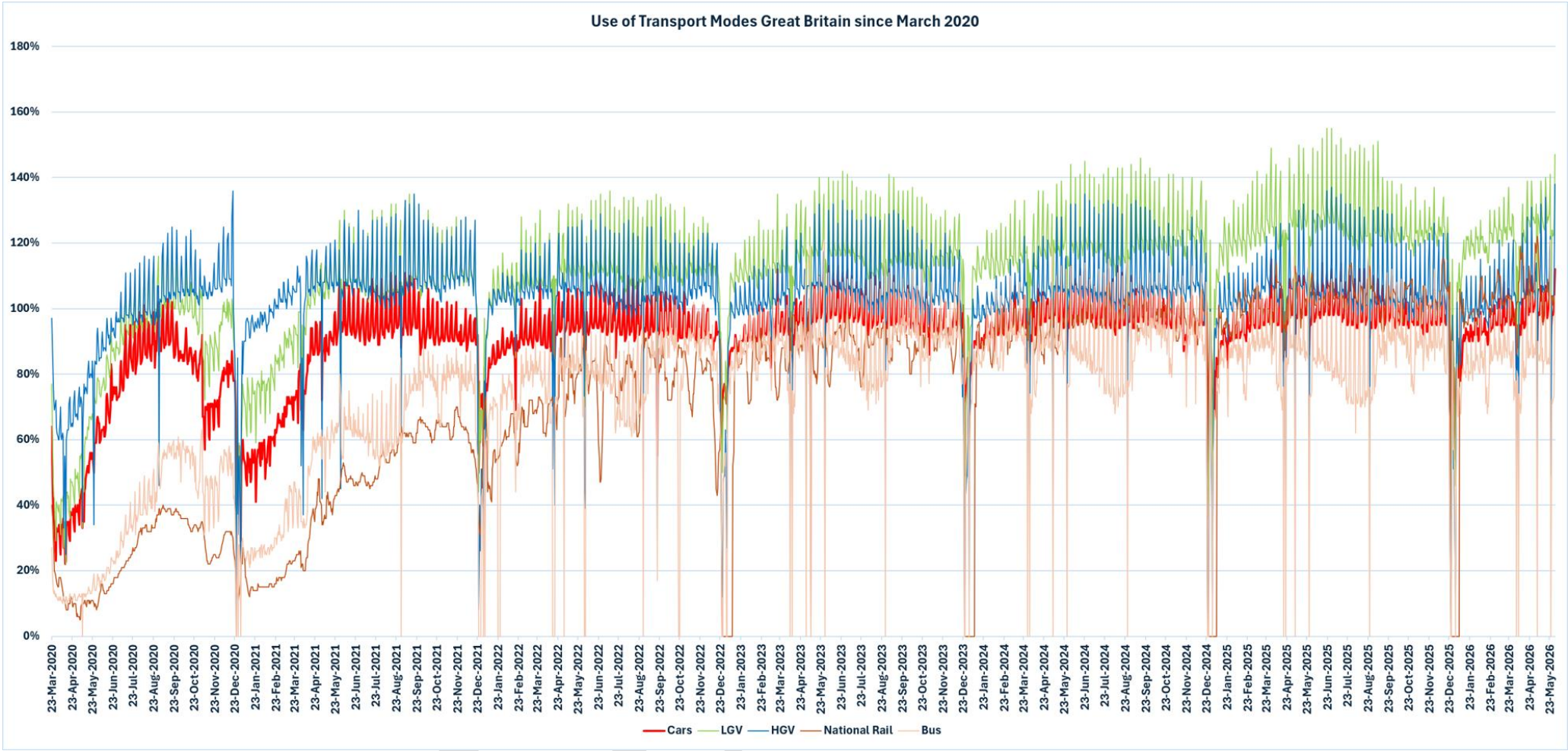

Figure 3: Use of Transport Modes in Great Britain since March 2020[2]

[2] Source: Jacobs analysis of DfT data from https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic, retrieved June 2026

2.3 Key Model Design Considerations

2.3.1 Software

PTV's VISUM 2020 has been used as the software platform for the highway component of the model. This was also the same software used to develop the 2019 KTM. Recognised benefits of using PTV VISUM for this application are:

- The speed with which detailed highway networks can be coded in VISUM;
- The data-handling and visualisation capabilities of VISUM;
- Easy extraction of results to spreadsheet and database formats for analysis and checking;
- The possibility of semi-automatic extraction to interoperable corridor micro-simulation models in the related PTV VISSIM software platform; and
- The possible development of a "real-time" predictive modelling tool based on the VISUM network using the related PTV Optima Software.

2.3.2 Highway Assignment Modelled Responses

The Sevenoaks Local Transport Model is designed to take account of future district and local growth in population and employment and to be capable of predicting likely travel behaviour in terms of trip distribution with one or both trip-ends within Sevenoaks over a temporal scale of a single peak hour. It is intended to allow for the strategic re-routing of the proposed schemes within the study area. No variable demand and public transport models are associated with the Sevenoaks Local Transport Model development, and therefore highway demand remains fixed.

3. 2019 Local Base Transport Model

3.1 Overview

This section summarises the outputs gathered from the 2019 Sevenoaks Local Transport Model for the AM and PM peak periods. The objective of this is to identify existing key junction and link issues. Junction Level of Service (LOS) and link Volume / Capacity (V/C) ratio were extracted from the transport model.

In interpreting the results, it should be noted that, in strategic modelling, issues identified at a particular junction may reflect wider delay or congestion along the surrounding corridor. Furthermore, outputs from the strategic model provide only a high-level indication of where highway capacity constraints are likely to arise.

To confirm these findings and identify appropriate mitigation measures, the development of local junction models—incorporating detailed geometry and visibility data for specific locations—is typically recommended as the next stage of assessment.

3.2 2019 Base Flows

Figures 3-1 and 3-2 illustrate the 2019 baseline traffic flows across the Sevenoaks district and its neighbouring authorities. During both the AM and PM peak periods, the highest traffic volumes are concentrated along the strategic motorway network, including the M25, M20, M26, and A21. These corridors carry significantly higher flows compared to other parts of the network, reflecting their role in accommodating long-distance and strategic movements.

In addition to the motorways, notable traffic flows are observed on the principal A roads that traverse the district and provide connections between key settlements. Elevated volumes are also evident within and around town centres, where localised trip demand and network constraints contribute to increased traffic activity during peak periods.

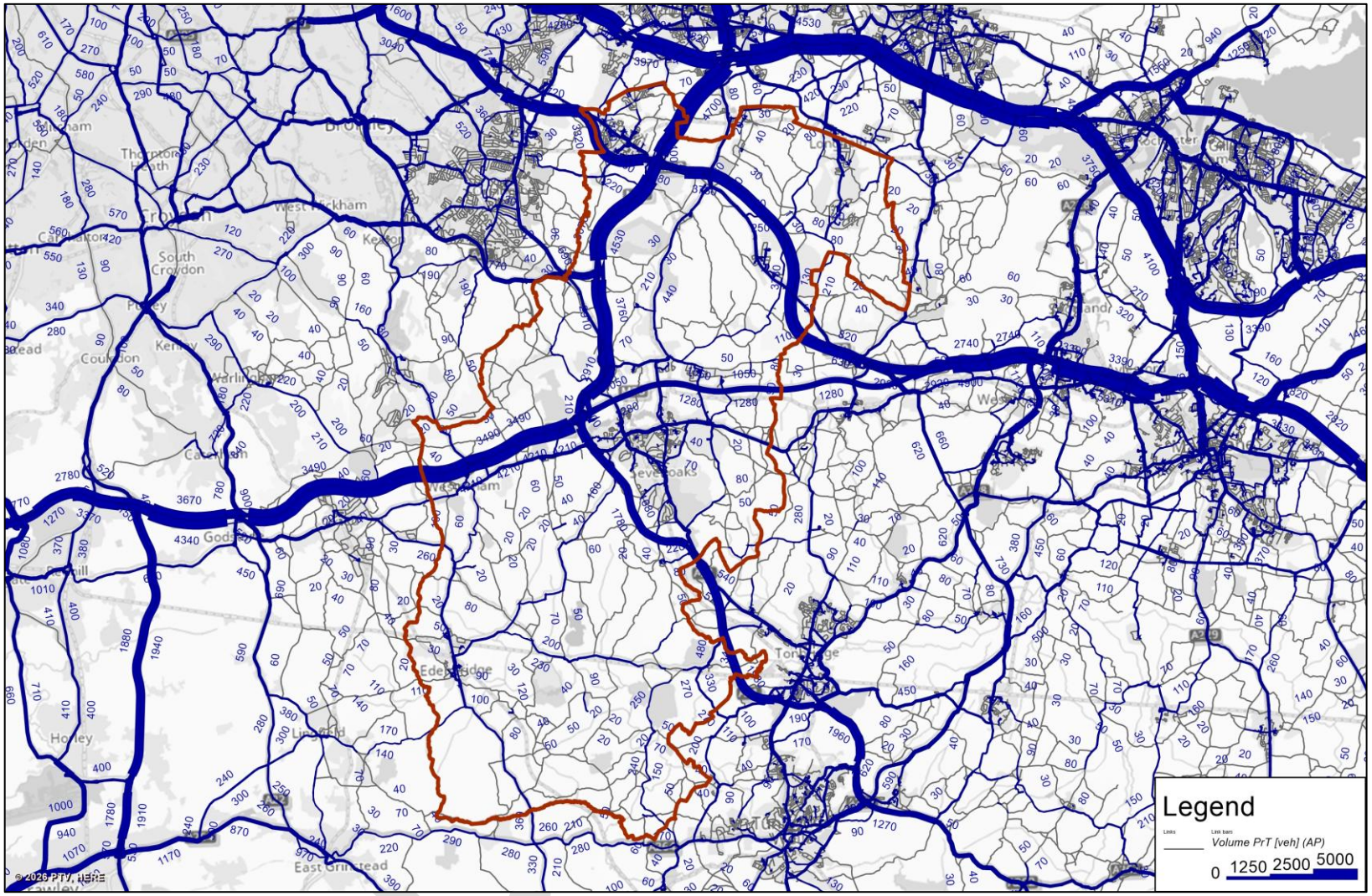

Figure 3-1: 2019 Flows - AM Peak

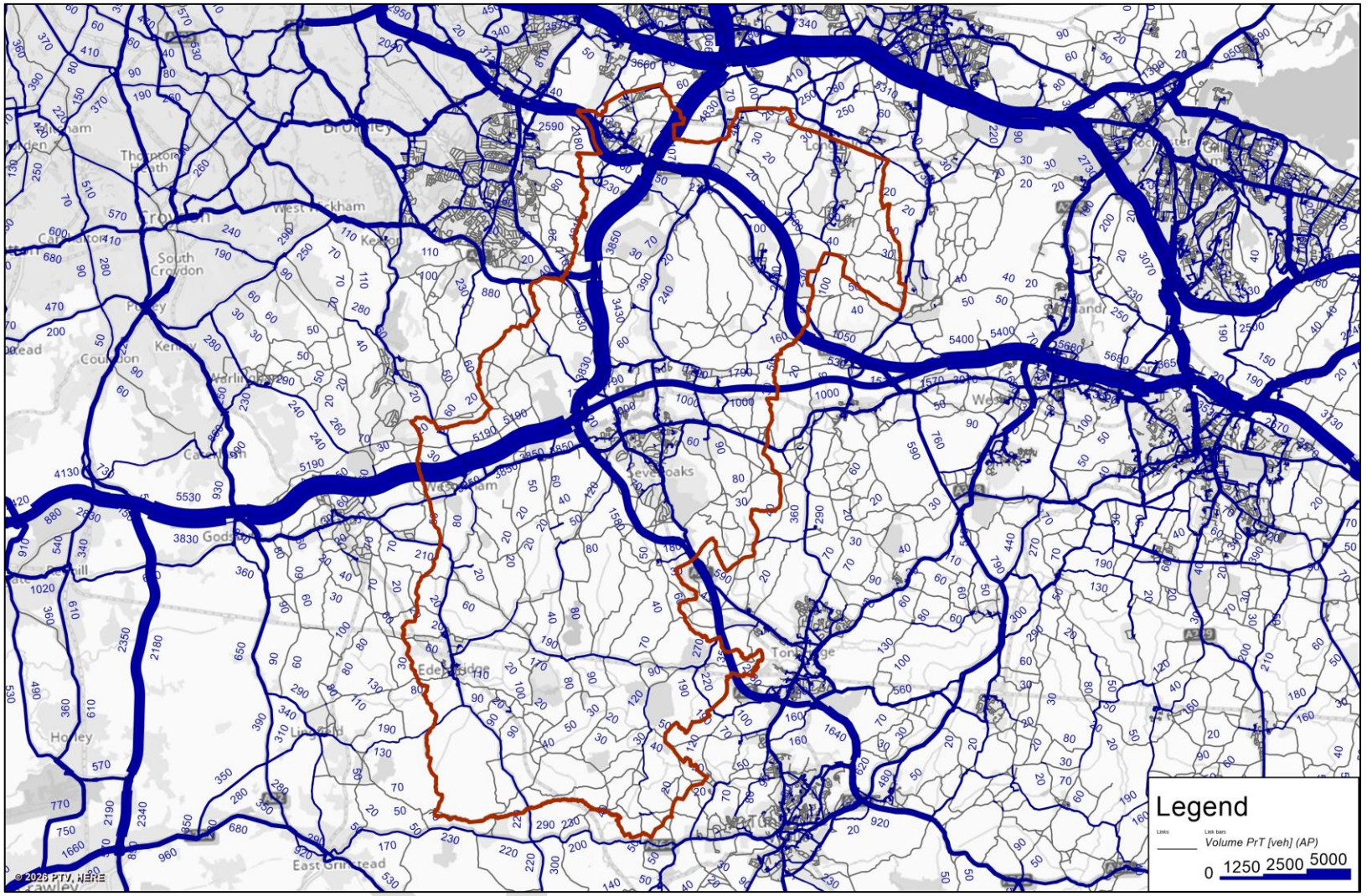

Figure 3-2: 2019 Flows - PM Peak

3.3 Model Outputs Criteria

Junction Level of Service (LOS) and link Volume / Capacity (VOC) ratio indicators were used as criteria to identify the link and junction "hot spots" in the study area.

Level of service plots provide a qualitative measure of how good the present traffic situation is on a given junction. As actual flow will vary for different days and different times in a day, LOS relates the traffic service quality to a given flow rate of traffic. VISUM defines the LOS based on the mean delay experienced by each vehicle. Table 3-1 defines the LOS by six levels ranging from level A to level F.

A	Level A represents the best quality of traffic where the driver has the freedom to drive with free flow speed.
B	Level B represents good traffic quality where driver can reasonably maintain free flow speed and maneuverability within the traffic stream is slightly restricted.
C	Level C represents stable traffic flows, at or near free flow. Ability to manoeuvre through lanes is noticeably restricted and requires awareness.
D	Level D represents almost unstable traffic flows. Speeds slightly decrease as traffic volume slightly increase. On this level driver comfort decreases.
E	Level E represents unstable traffic flows, operating at capacity. Driver's level of comfort becomes poor.
F	Level F represents the worst traffic quality with forced or breakdown traffic flows. Travel time cannot be predicted, with generally more demand than capacity.

Table 3-1: Level of Service Description

On the other hand, volume / capacity is the ratio of assigned traffic volume to the modelled link capacity and the ranges used are set out below.

V/C Ratio	Description
<= 75%	Stable flow with acceptable delay
<= 85%	Approaching unstable flow but with tolerable delay
<= 100%	Unstable flow
> 100%	Over-capacity

Table 3-2: Level of Service Description

3.4 2019 Junction and Link "Hot-Spots"

Figure 3-3 to Figure 3-10 show the junction maximum LOS and link V/C ratio for 2019 AM and PM peak periods.

During the AM and PM peak periods, the majority of junctions and links within Sevenoaks District operate within acceptable capacity conditions, generally experiencing low to moderate levels of delay. This is reflected in LOS ranging from B to D, alongside V/C ratios below 85%, indicating that these parts of the network are functioning with some available capacity and manageable queues.

However, a number of key junctions and links listed in the table below were already experiencing operational stress in the 2019 base year. These locations are characterised by severe levels of delay, with LOS ratings deteriorating to E and F and V/C ratios exceeding 85%. Such conditions indicate that demand is approaching or exceeding available capacity, resulting in increased congestion, longer queue lengths, and reduced journey time reliability. These locations are typically associated with principal routes and junctions near strategic connections or urban centres, where peak-period travel demand is most concentrated.

Area		Road /Junction	2019 Base
Swanley, Eynsford, New Ash Green and Halstead	V/C >85%	Bartholomew Way	>85%
		High Street	>85%
	LOS E or F	High Street/St Georges Road	E
		Gorse Hill Main Road/Donkey Lane	F
		M25 J3	F
		Hewitts Roundabout	F
Sevenoaks Town, and Otford	LOS E or F	A25 / Bradbourne Road	E
		Seal Road/Filmer Lane/ Seal Hollow Road	E
		Westerham Road/Larkfield Road	E
		A25 / Otford Road / St Johns Hill	F
		High Street/Pembroke Road	F
		Westerham Road/ A21 Onslip SB	F
		Station Road / Shoreham Road / Pilgrims Way E	E
Edenbridge	LOS E or F	Mont St Aignan Way/Lingfield Road	F
		Mont St Aignan Way/Stangrove Road	F
		B2026 Station Road/High Street	E

Table 3-3: 2019 List of Junction and Link "Hot Spots"

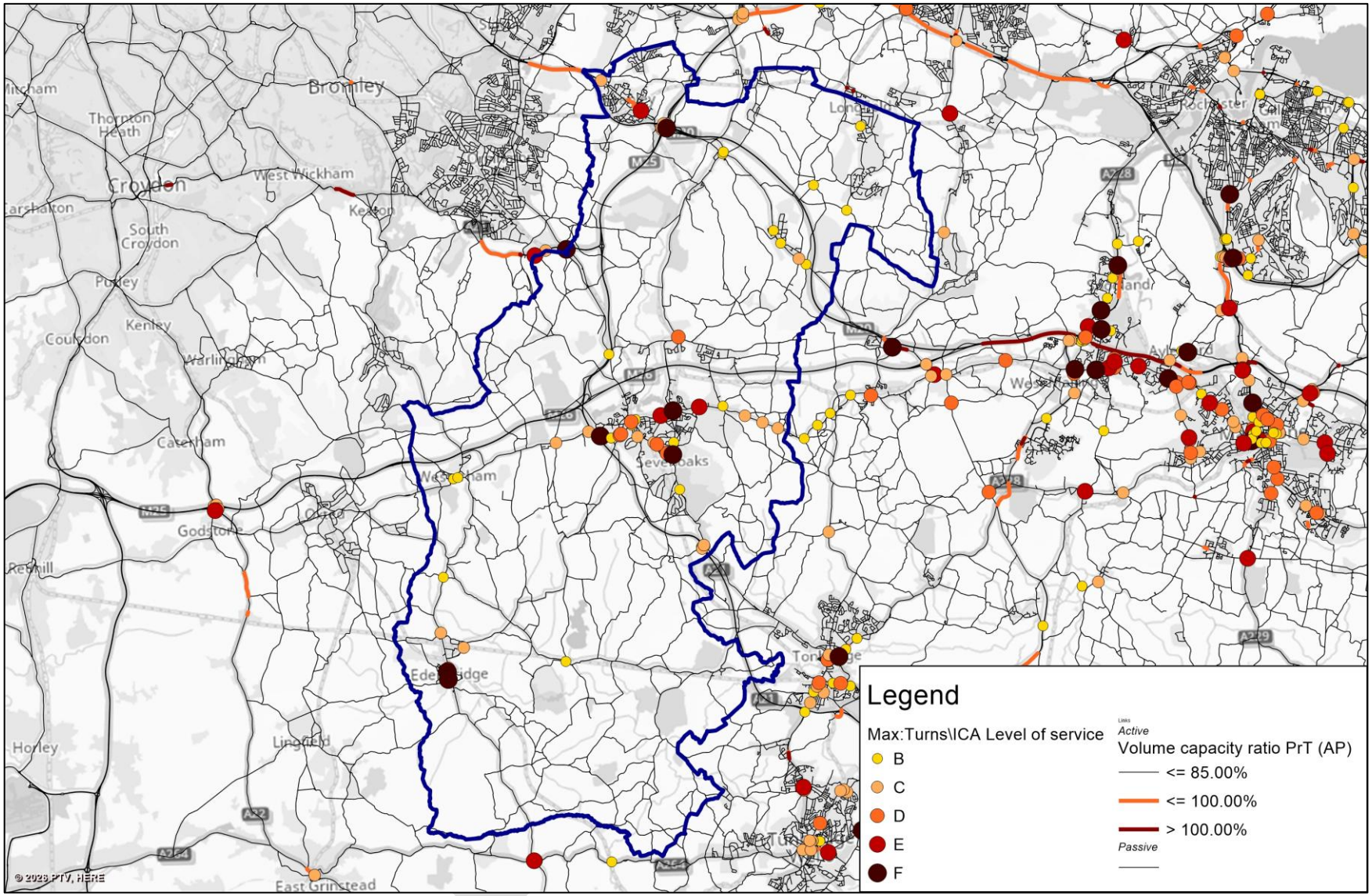

Figure 3-3: 2019 AM Peak Junction and Link "Hot Spots" – Sevenoaks District

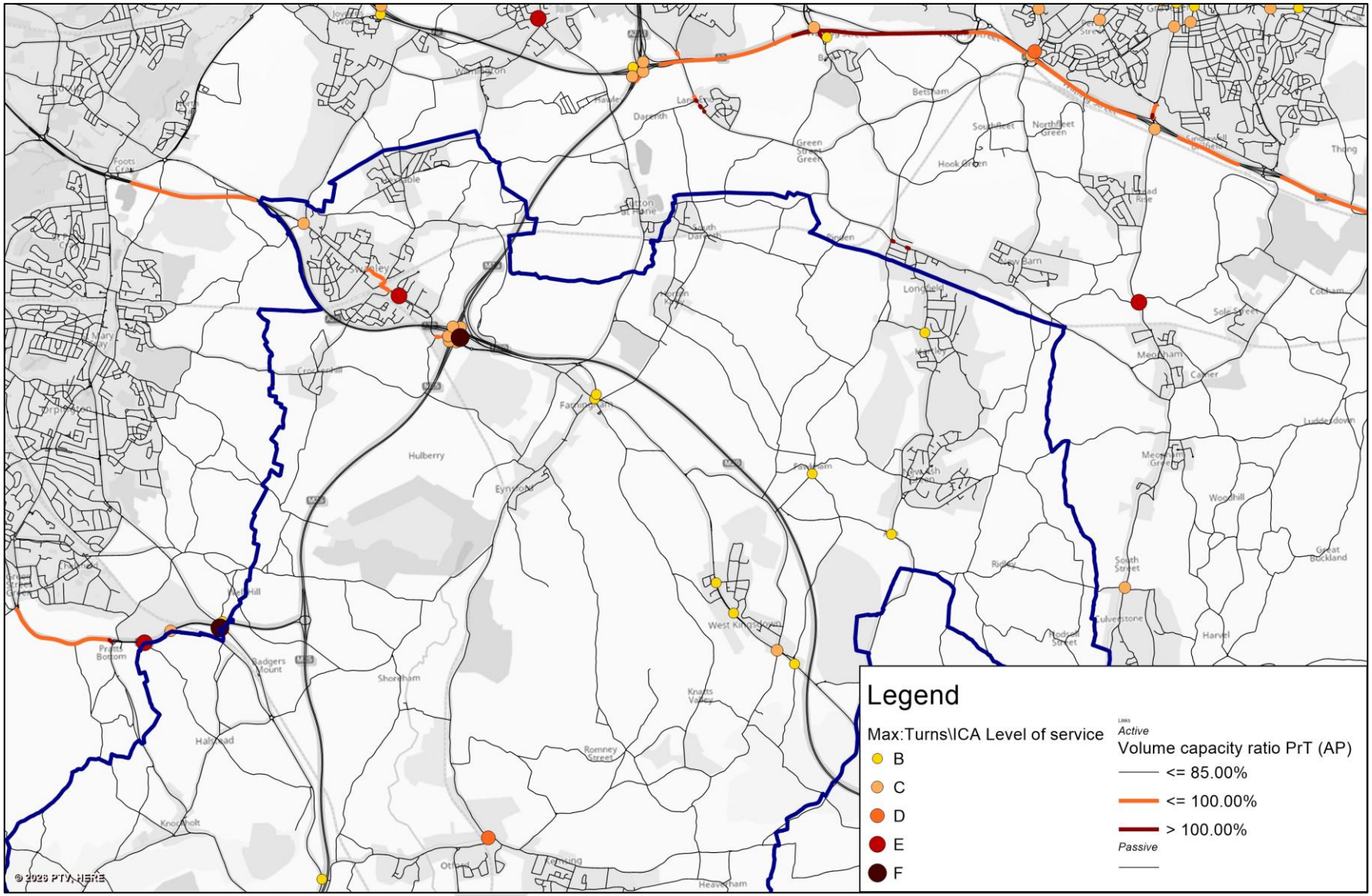

Figure 3-4: 2019 AM Peak Junction and Link "Hot Spots" – Swanley, Eynsford, New Ash Green and Halstead

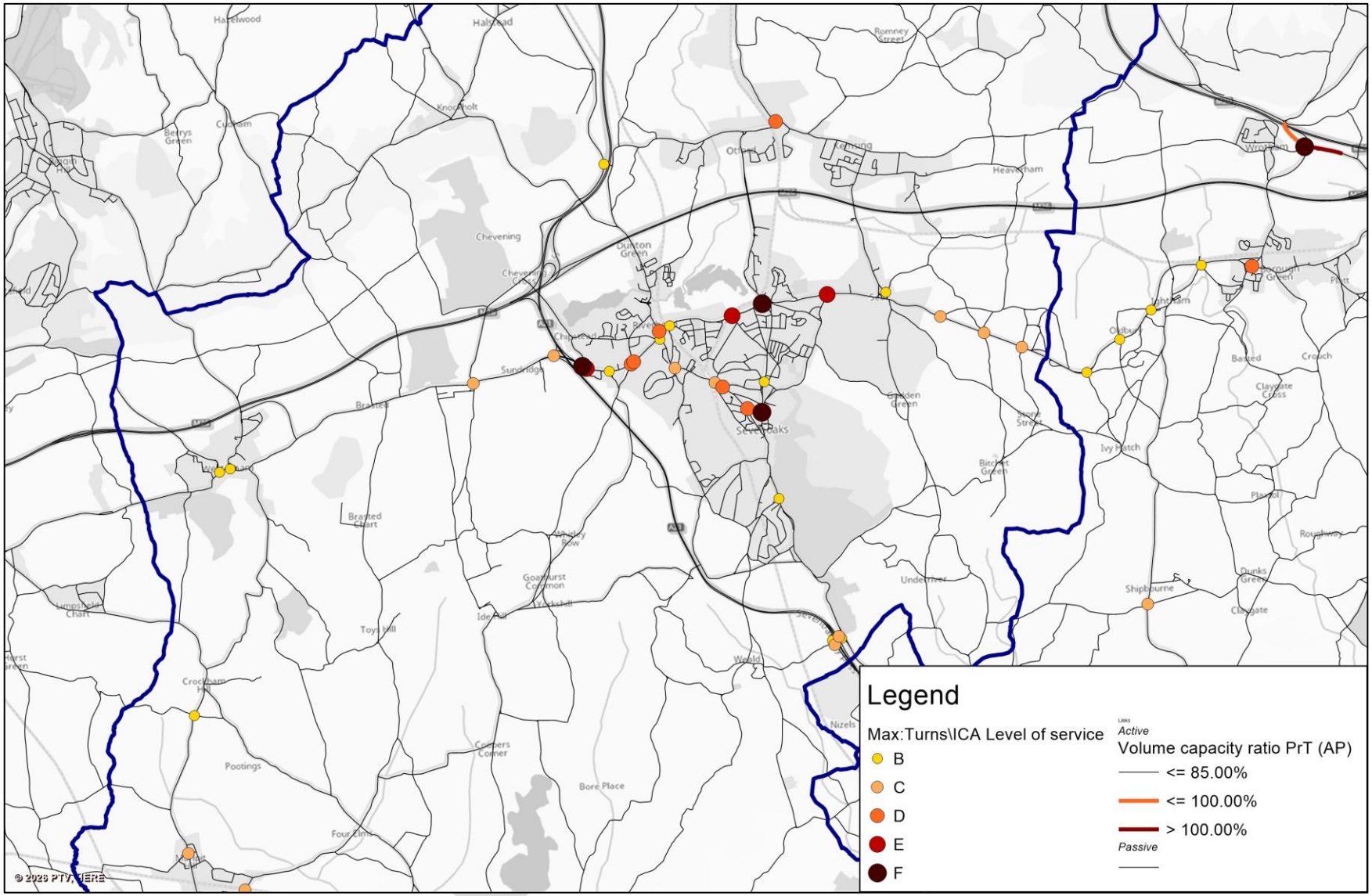

Figure 3-5: 2019 AM Peak Junction and Link "Hot Spots" – Sevenoaks Town and Otford

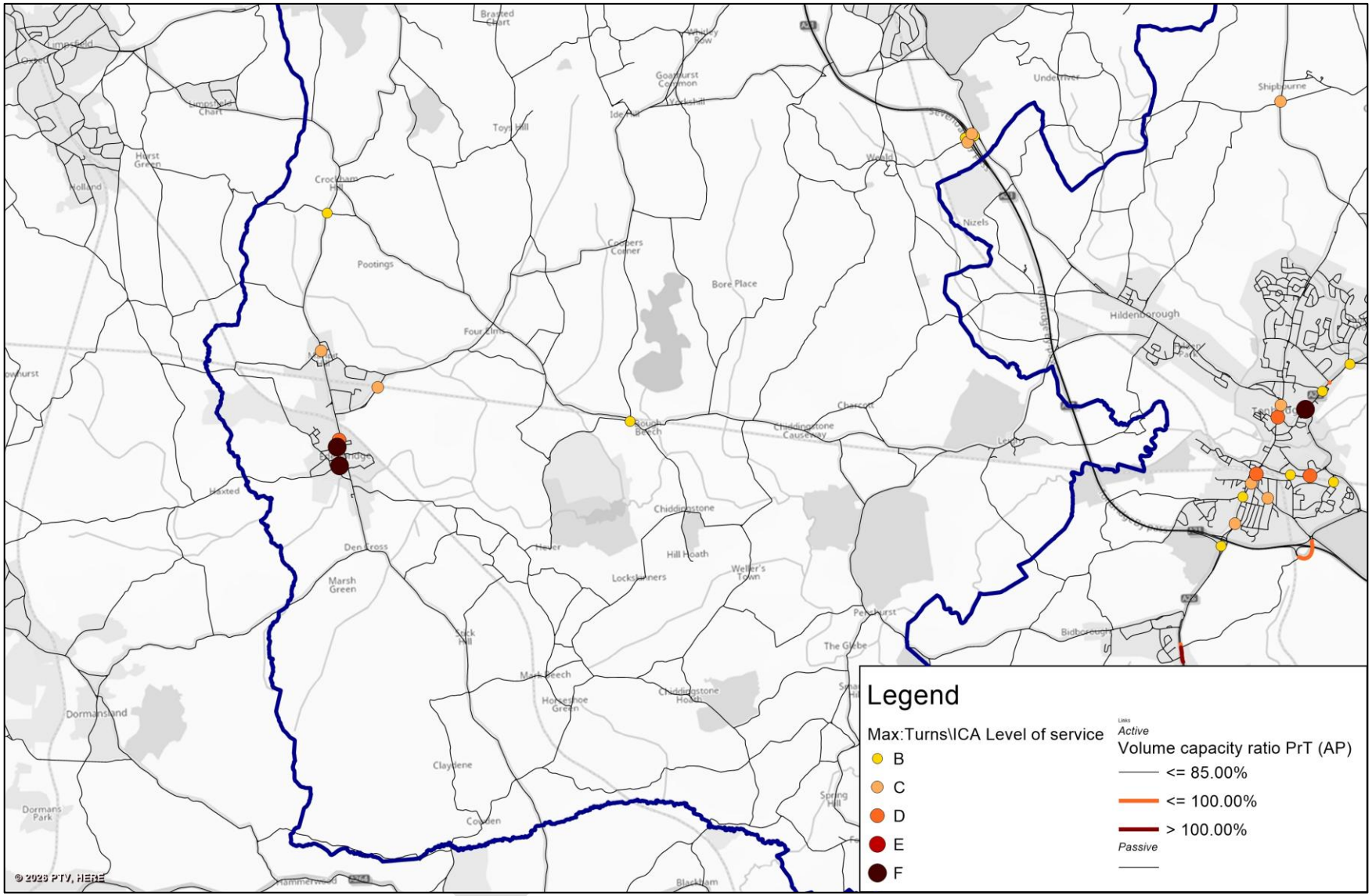

Figure 3-6: 2019 AM Peak Junction and Link "Hot Spots" – Edenbridge

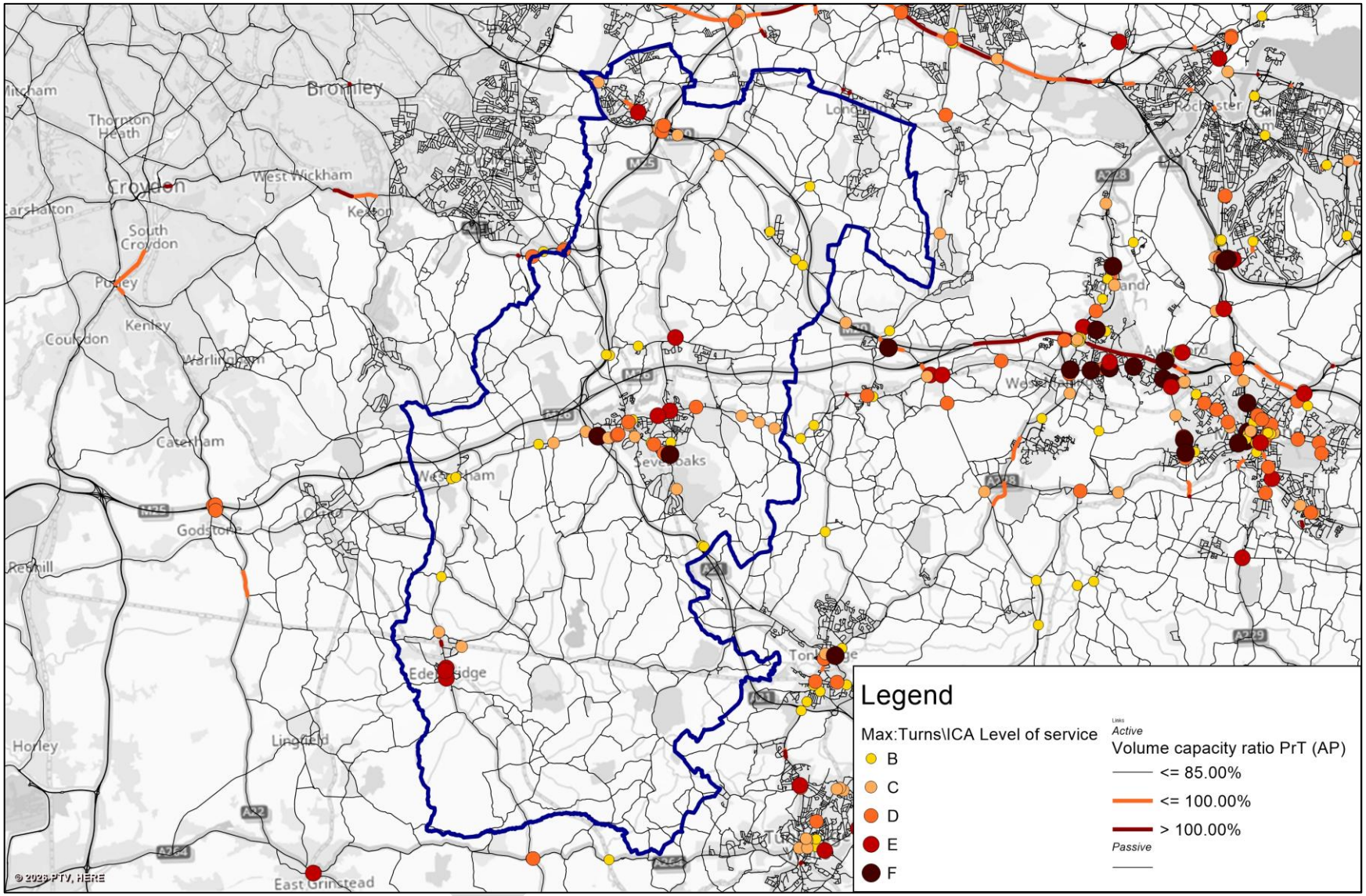

Figure 3-7: 2019 PM Peak Junction and Link "Hot Spots" - Sevenoaks District

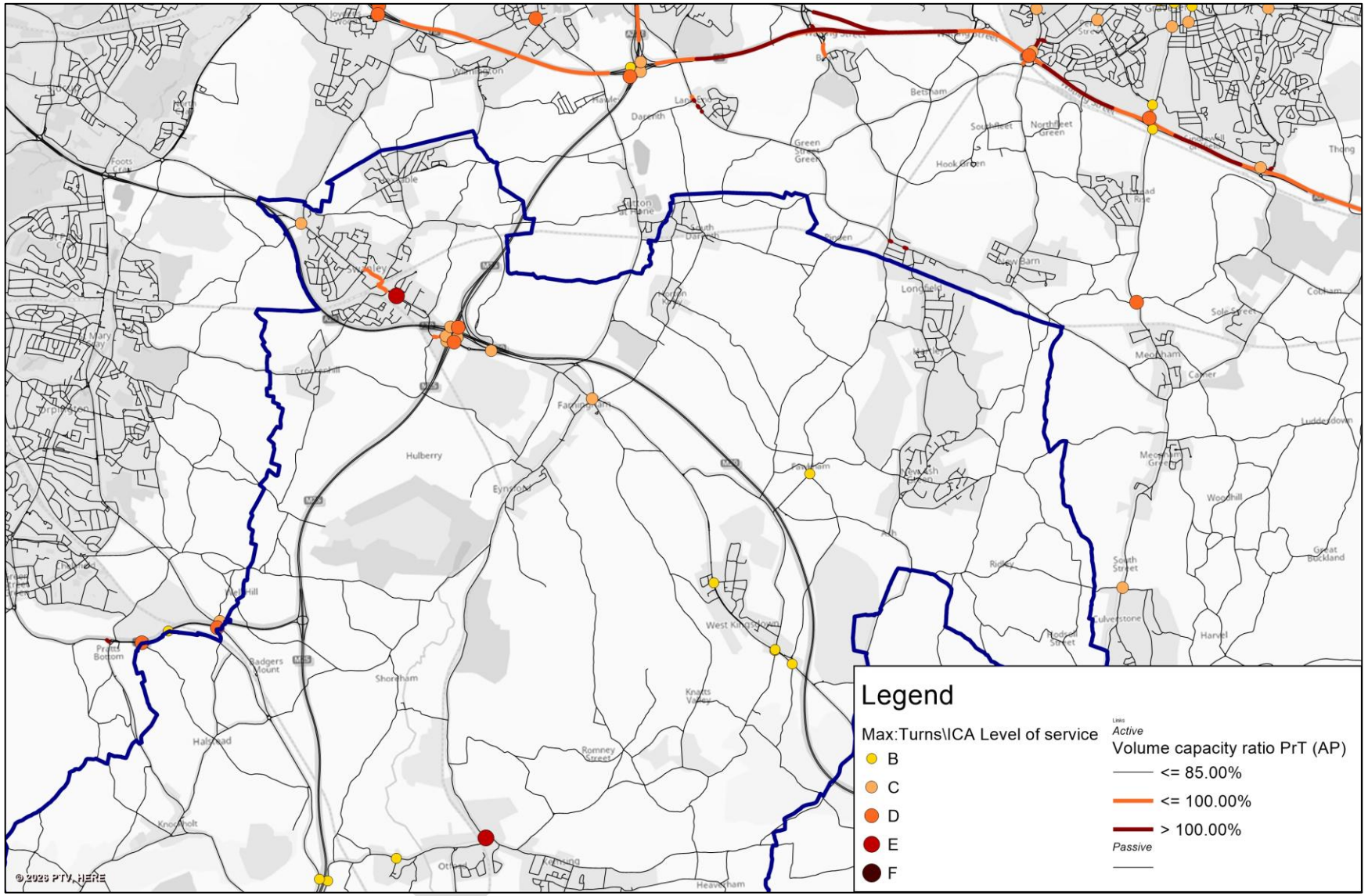

Figure 3-8: 2019 PM Peak Junction and Link "Hot Spots" – Swanley, Eynsford, New Ash Green and Halstead

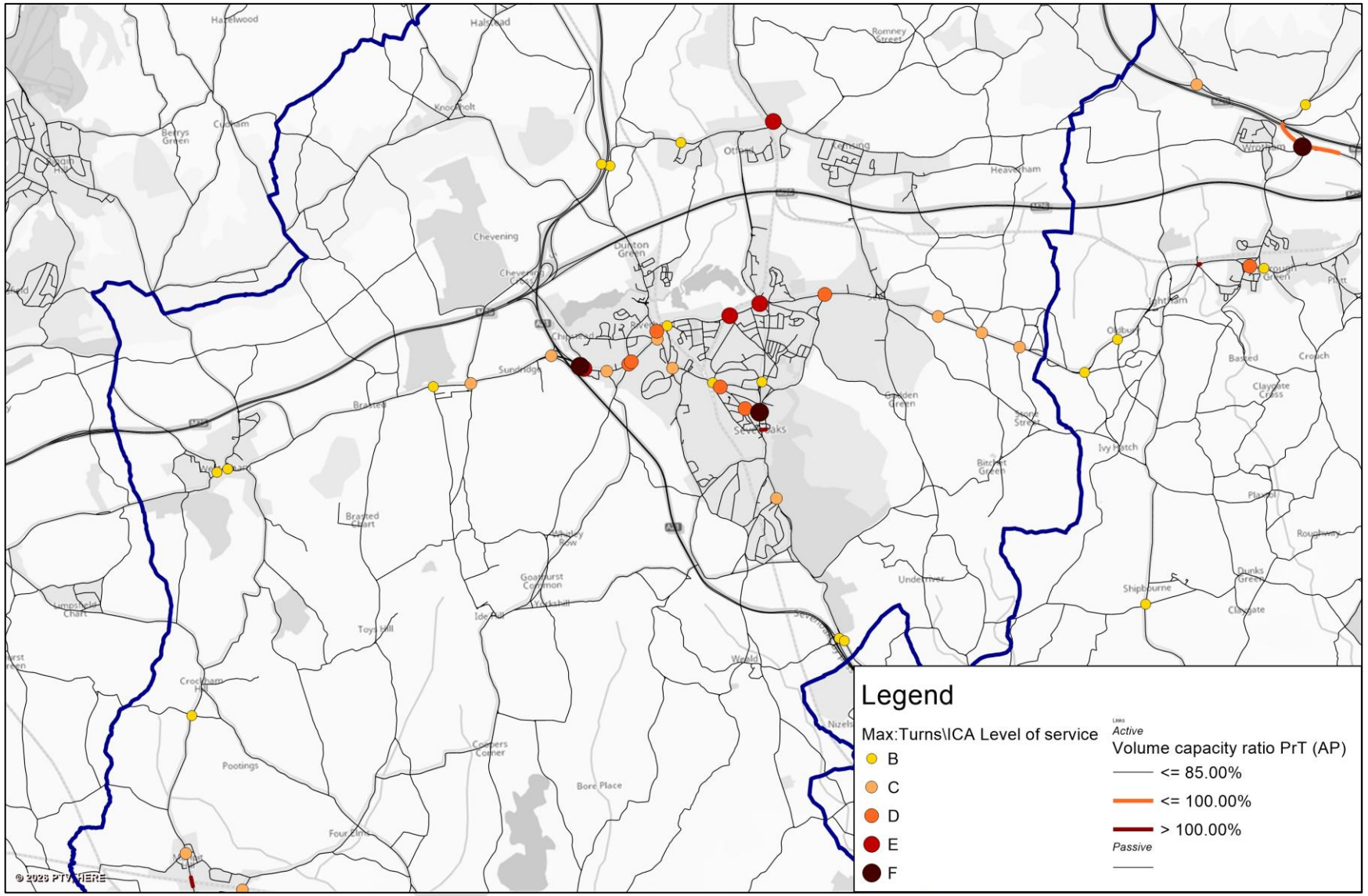

Figure 3-9: 2019 PM Peak Junction and Link "Hot Spots" – Sevenoaks Town and Otford

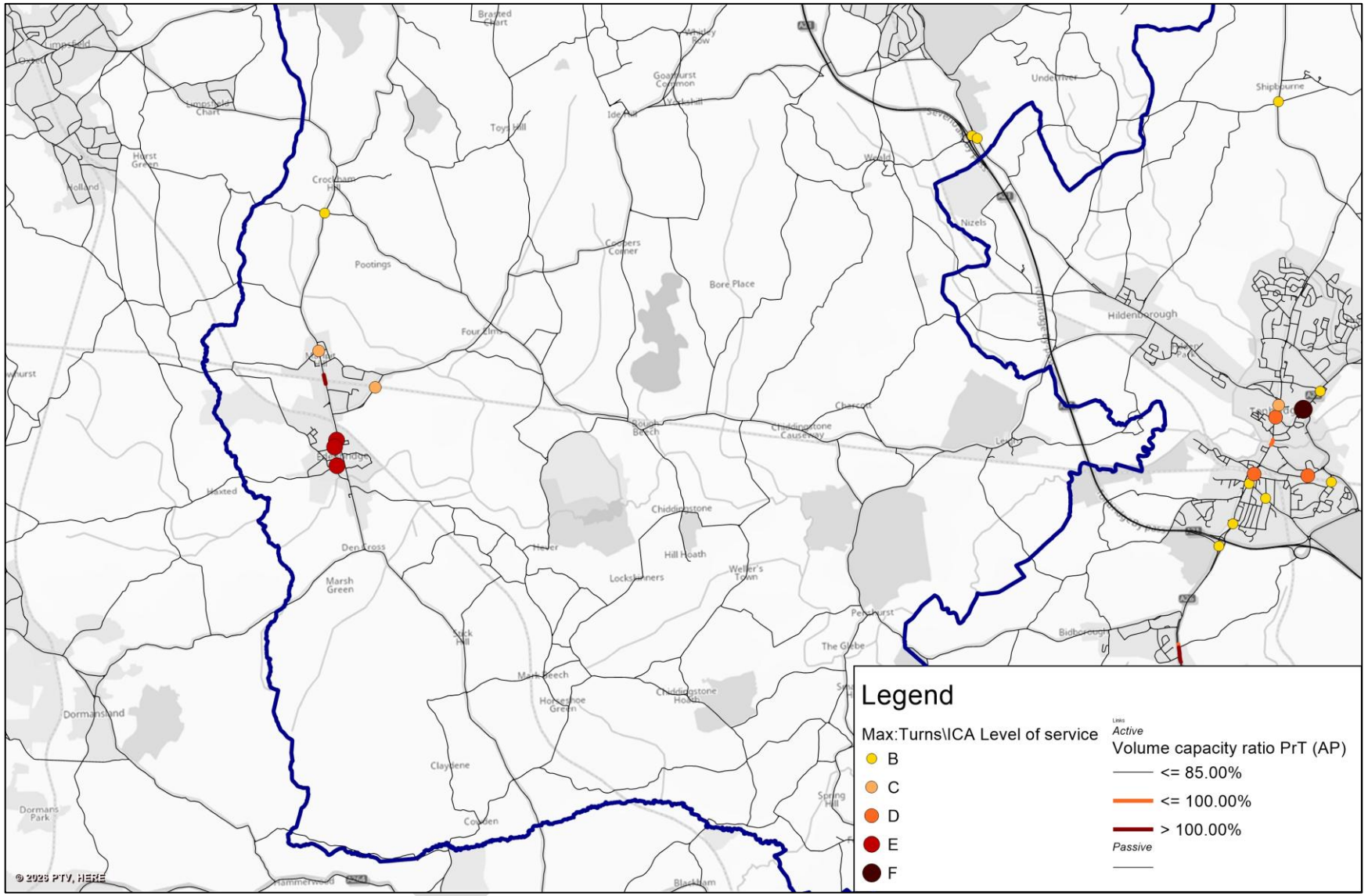

Figure 3-10: 2019 PM Peak Junction and Link "Hot Spots" – Edenbridge

4. Approach to Forecasting

4.1 Overview

In accordance with TAG Unit M3.1 guidance, the forecasting approach for the Sevenoaks Local Transport Model involves three basic elements:

- Development of a future year network;
- Derivation of future year demand; and
- Demand assignment.

4.2 Forecast Baseline Scenario

A 'Forecast Baseline' has been developed using local growth assumptions in Sevenoaks. This includes completions and consented developments and infrastructure planned for the 2019 to 2042 growth period within Sevenoaks District, combined with the growth assumptions in neighbouring authorities and external areas. More details on the highway growth assumptions are discussed in Section 4.4 of this report.

4.3 Forecast Network Development

A 2042 future year network has been prepared for the purposes of Sevenoaks Local Transport Model forecasts. The network for the forecast year was based on the calibrated and validated base year network and includes additional schemes that may be in place by the forecast year.

A list of potential infrastructure projects based on this guidance were collated and confirmed, in consultation with SDC and KCC for inclusion in the transport networks.

4.3.1 Highway Schemes

Within Sevenoaks District, only the roundabout improvement scheme at the A25 Bradbourne Road / A225 Otford Road / A25 Seal Road (Bat and Ball junction) was included. Although there is no direct impact on Sevenoaks District, as a neighbouring authority, the committed highway schemes in Tonbridge and Malling Borough were also coded into the model.

In addition, in March 2025, the Secretary of State for Transport granted development consent for the Lower Thames Crossing (LTC) application. A collaborative decision was made between National Highways (NH), Kent County Council (KCC), and Sevenoaks District Council (SDC) to include the LTC in the transport model, as it is now classified as a committed highway scheme. However, should there be any changes to the status of the LTC, a sensitivity analysis can be carried out to reflect those changes.

Table 4-1 summarises the infrastructure schemes included in the Forecast Baseline, while Figure 4-1 to Figure 4-3 show the location of these schemes.

Local Authority	Scheme Name	Scheme Description
Tonbridge and Malling Borough	1 - Link Road Hermitage Lane	Link Road between B246 Hermitage Lane and A20 London Road.
	2 - A20 New Road junction improvement	Improvement to A20 London Road / New Road / Hotel Access junction in connection with a development site on land to east of Clare Park Estate, New Road, East Malling
	3 - Bellingham Way and Station Rd	Link road between Bellingham Way and Station Road, Aylesford
	4 - Beaver Rd, London Road junction improvement	Junction improvement scheme for the Beaver Road arm of A20 / Bunyard Way / A20 / Beaver Road signalized junction, related to the proposed development of 106 dwelling at Land South of London Road and West of Castor Park, Allington
	5 – Bushey Wood Development	Junction changes in connection with development site. New access arrangement on New Court Road and Bull Lane, junction improvement on New Court Road/Rochester Road and closure of the northern section of Bull Lane
	6 – Lorry Park	Access arrangement for a roundabout on the A20 (near Wrotham Heath Interchange Roundabout/M26) for access to development "Land West of the A20 & North of the M26"
	7 – Coldharbour Roundabout Scheme	Junction improvement scheme in roundabout connecting the A20 and a link road to the M20 junction 5. Considerable growth planned in the area.
Gravesham and Medway	8 – Lower Thames Crossing (LTC)	LTC will be a new road connecting Kent, Thurrock and Essex. The proposed road will be connected to A2/M2 to the M25.
Sevenoaks District	9 – A25 Bradbourne Road / A225 Otford Road / A25 Seal Road Junction	Junction improvement scheme to change from a signalized junction to a roundabout

Table 4-1: Forecast Baseline Scheme Description

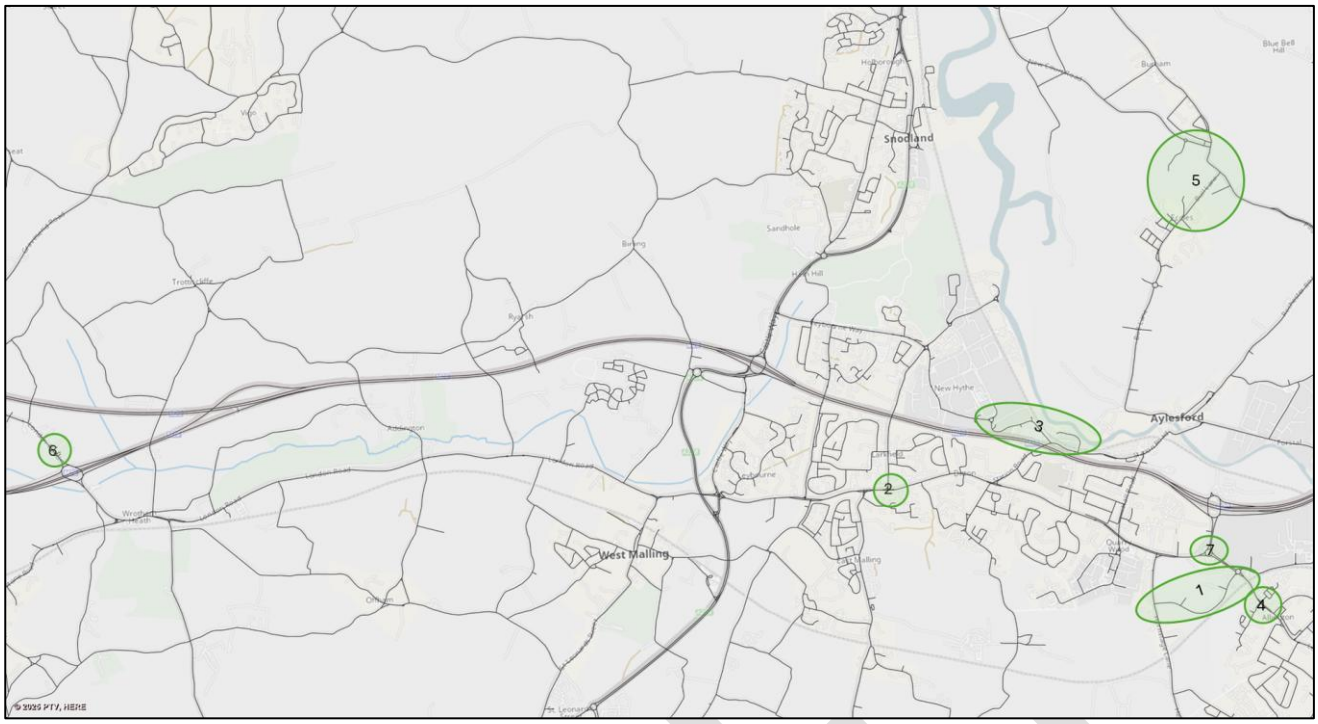

Figure 4-1: Committed and Completed Infrastructure Schemes in Tonbridge and Malling Borough

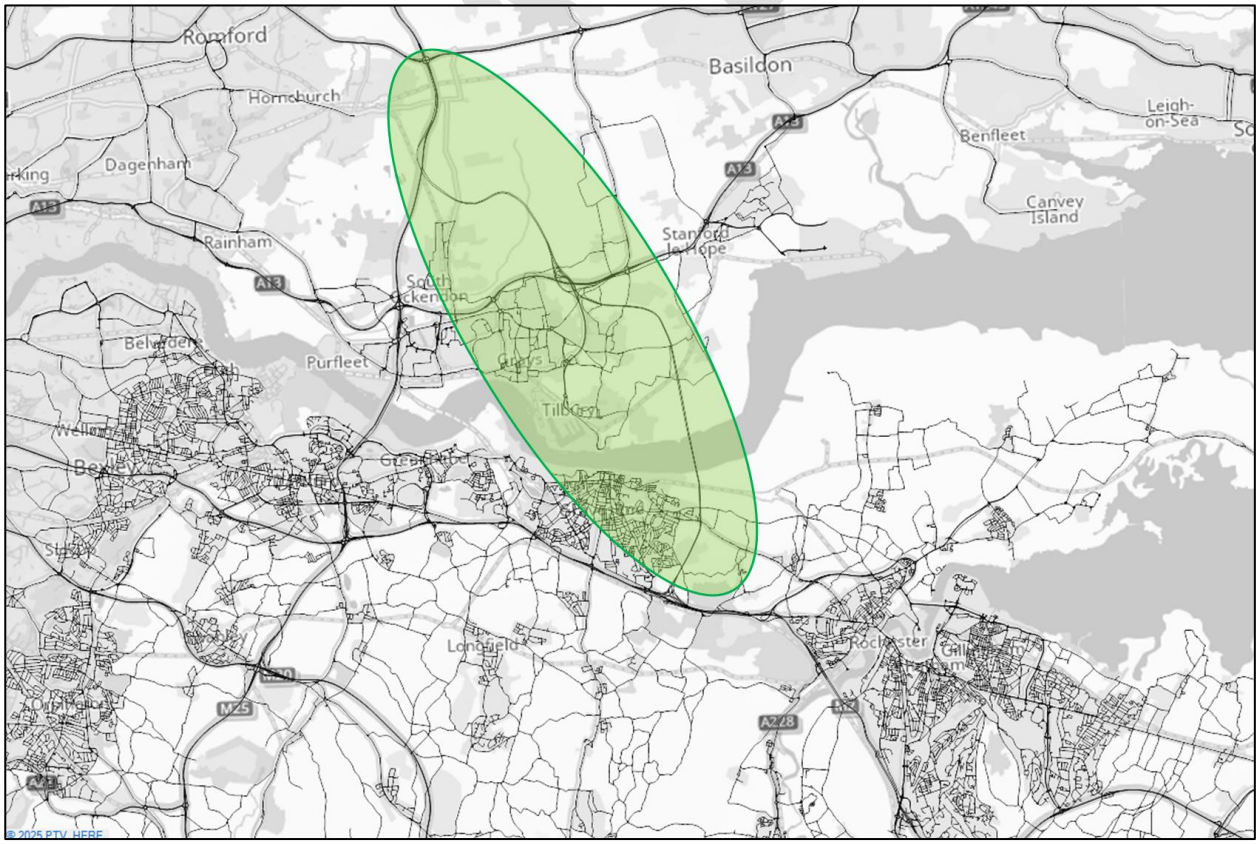

Figure 4-2: Lower Thames Crossing

Figure 4-3: Committed Infrastructure Schemes in Sevenoaks District

4.3.2 Highway Forecast Year Values of Time and Vehicle Operating Costs

The values of the pence per minute (ppm) as Value of Time (VoT) and pence per kilometre (ppk) as Vehicle Operating Costs (VOC) parameters used for the Sevenoaks Local Transport Model highway assignment are based on the latest TAG Unit A1.3 guidance and Data Book available at the time of model development (November 2022 v1.20.1). Network average speed and OGV1/OGV2 proportions were inherited from the base model. The HGV Value of Time (VoT) values are doubled, consistent with the base model.

The final calculated values for highway VoT and VOC for the 2042 forecast year of the Sevenoaks Local Transport Model are provided in Table 4-2.

The final input for implementation in VISUM is also shown in the table; the formats required being a coefficient for pence per metre (ppmetre) for VOC as a weighted ratio of the VoT pence per second (pps).

Time Period	User Class	2042 Base Year TAG Databook Value		2042 Base Year VISUM Units		2042 Base Year Final VISUM Coefficients	
		VoT (ppm)	VOC (ppk)	VoT (pps)	VOC (ppmetre)	VOT	VoT (ppm)
AM	UC1 Car Commute	28.3397	4.2695	0.4723	0.0043	1	0.0043
	UC2 Car Business	42.2587	9.0377	0.7043	0.0090	1	0.0090
	UC3 Car Other	19.5522	4.2695	0.3259	0.0043	1	0.0043
	LGV	30.6254	10.7866	0.5104	0.0108	1	0.0108
	HGV (doubled VoT)	61.0000	38.8785	1.0167	0.0389	1	0.0389
PM	UC1 Car Commute	28.4375	4.2912	0.4740	0.0044	1	0.0044
	UC2 Car Business	42.8685	9.1152	0.7145	0.0093	1	0.0093
	UC3 Car Other	20.4752	4.2912	0.3413	0.0044	1	0.0044
	LGV	30.6254	10.8302	0.5104	0.0111	1	0.0111
	HGV (doubled VoT)	61.0000	39.2332	1.0167	0.0393	1	0.0393

Table 4-2: 2042 Highway Generalised Cost Parameters

4.4 Forecast Demand Development

This section describes how future year fixed demand matrices have been developed. A forecast year of 2042 has been modelled with TEMPro v8 and local growth assumptions.

4.4.1 Overview

Table 4-3 summarises the approach undertaken in developing the future demand for Sevenoaks Local Transport Model forecast baseline. The assumptions used were split into three categories to cover the study area, neighbouring authorities and other/external areas. Each component mentioned below (i.e uncertainty log, TEMPro, trip rates, etc) was also discussed in the succeeding sections in detail.

Area	Assumptions	Purpose
Sevenoaks	Completed and committed developments and infrastructure schemes were assumed in the forecast baseline and no TEMPro uplift was included.	Assumed a situation of no further growth in the District, to establish the baseline for the local plan.
Neighbouring Authorities (Tonbridge and Malling, Maidstone, Tunbridge Wells, Gravesham, Medway, Dartford, Surrey and Southeast London)	TEMPro v8 (with adjustment of the default Housing and Job assumptions to match updated housing need/LP targets where known). In the neighbouring authorities, "Near Certain" developments and potential larger LP sites (which could fall under "More than Likely" or "Reasonably Foreseeable") were included together with background growth from TEMPro v8 using the alternative assumptions tool (subtracted from TEMPro v8 to avoid double-counting).	Takes in to account the likely level of expected growth in the key neighbouring areas.
Other Areas	TEMPro v8 growth was applied.	Takes in to account broader general 'background growth' in area further away from the study area.

Table 4-3: Sevenoaks - 2042 Highway Growth Assumptions

4.4.2 Identification of Planning Data (Uncertainty Log Development)

The primary purpose for developing the Uncertainly Log is to provide spatial distribution of planned developments and transport schemes by using Local Authority planning data for housing and employment.

In order to develop the forecast baseline, Uncertainty Log information has been provided by SDC and includes information on completions/demolitions since the base year and a list of future committed developments and infrastructure schemes within Sevenoaks and key neighbouring areas.

The Uncertainty Log information includes:

- Latest available information at the time of model development on completions/demolitions since 2019, including location and size;
- Committed development locations, land use and size (number of dwellings or floorspace);
- Access arrangements and any changes to the existing network related to developments; and

- Committed infrastructure schemes or network changes (i.e major junction upgrade, new link road or local speed reductions).

The Uncertain Log was prepared in accordance with TAG Unit M4 which provides classifications of probability of a development shown in Table 4-4. Table includes the development status and the assumption to include in core or alternative scenarios.

Probability of the Input	Status	Core Scenario Assumption
Near certain: The outcome will happen or there is a high probability that it will happen.	Intent announced by proponent to regulatory agencies. Approved development proposals. Projects under construction	This should form part of the core scenario.
More than likely: The outcome is likely to happen but there is some uncertainty	Submission of planning or consent application imminent. Development application within the consent process.	This should form part of the core scenario.
Reasonably foreseeable: The outcome may happen, but there is significant uncertainty.	Identified within a development plan. Not directly associated with the transport strategy/ scheme but may occur if the strategy/scheme is implemented. Development conditional upon the transport strategy/scheme proceeding. Or, a committed policy goal, subject to tests (e.g.,of deliverability) whose outcomes are subject to significant uncertainty.	These should be excluded from the core scenario but may form part of the alternative scenarios.
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	Conjecture based upon currently available information. Discussed on a conceptual basis. One of a number of possible inputs in an initial consultation process. Or, a policy aspiration	These should be excluded from the core scenario but may form part of the alternative scenarios.

Table 4-4: Classification of Future Development Inputs from TAG Unit M4, Table A2

In accordance with TAG Unite M4, developments with "Near Certain" within Sevenoaks were included in the forecast baseline, which formed the car growth in the district.

In the neighbouring authorities, "Near Certain" developments and potential larger LP sites (which could fall under "More than Likely" or "Reasonably Foreseeable") were included together with background growth from TEMPro v8 using the alternative assumptions tool to deduct the housing and jobs associated with committed and larger LP sites developments.

Growth outside of Sevenoaks and neighbouring authorities come solely from TEMPro and Road Traffic Forecast (RTF) 22. More details can be found in Sections 4.4.4 and 4.4.5.

4.4.3 Forecast Baseline Developments

As described in the previous section, the Uncertainty Log has been provided by SDC and analysed to understand the committed development to be completed before 2042. The final increase of dwellings and employment space between 2019 and 2042 for Sevenoaks is shown in **Error! Reference source not found.**. The location of these developments is shown in Figure 4-4 and the complete list is presented in Appendix A. This represents the latest available information at the time of model development. For employment, several sites have been proposed to be demolished and replaced by housing or other developments. These changes in the use were taken into consideration to avoid double counting.

	Dwellings Units	Floorspace (sqm)
Completed Developments	2,509	103,231
Extant Developments	3,878	
Windfall Sites	949	

Table 4-5: Sevenoaks Uncertainty Log 2019-2042

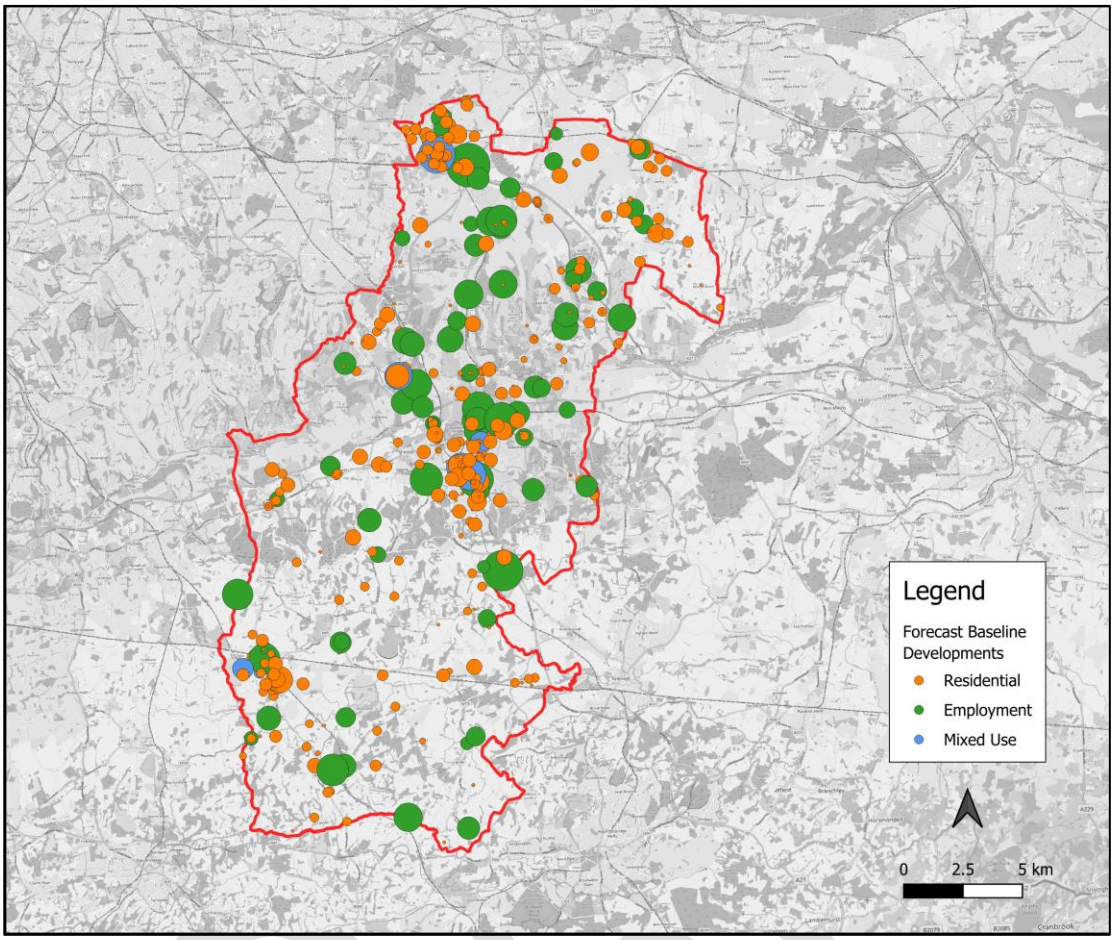

Figure 4-4: Location of Committed Developments in Sevenoaks District

4.4.4 TEMPro and Background Growth Calculation

Trip End Model Presentation Program (TEMPro) is a software that summarises the growth forecast from the National Trip End Model (NTEM). This data takes into account national projections of population, employment, housing, car ownership and trip rates. TEMPro v8 datasets were used to calculate the background growth for 2042 forecast year. The number of households or jobs associated with specific developments in the neighbouring authorities was subtracted from NTEM using the 'alternative planning assumptions' within TEMPro to produce factors for the NTEM-based background growth in trip ends. These factors were used to calculate the reduced background growth to avoid double-counting. For the rest of the areas outside the neighbouring authorities, unadjusted TEMPro growth were applied.

4.4.5 Trip Generation

As discussed with KCC and SDC, trip rates information from TRICS (Trip Rate Information Computer System) were used to calculate the baseline trips, taking into account both proposed and demolished developments as advised by SDC. This included surveys from 2015 (the current default date set in the software in order to cut off old data from the calculation) up to 2025. Manual edits were made to exclude sites surveyed during the pandemic period and on weekends (Saturday and Sunday).

Where possible, the preferred approach was to exclude sites located outside England or within London, however, the opportunity to apply this was constrained to just a handful of site selections, due to the limited number of surveys available in TRICS for the required land uses. This was also the case when looking to adjust the town centre site selections to reflect the impact of proposed sites with no

or low parking provision. With a low number of surveys available when selecting the town centre parameter, this was only able to be applied in one instance (for B1 office land use). In general, where available surveys were limited, it was considered more representative to apply greater number of surveys than to narrow the search selection down to a single survey, and so where possible a minimum of 3 surveys per selection was retained.

For flats and houses, the information from SDC did not specify what proportion were to be private and what proportion were to be affordable, and so a generalised 40% affordable and 60% private split was applied.

Specific trip rates were also used for the developments based on their location (i.e., Town Centre, Edge of Town Centre, Suburban Area, and Neighbourhood area). While there were houses shown to be located in the town centre locations, this parameter selection was unavailable in the TRICS database. It was agreed to apply the assumption that there would be flats only in the town centre, and both flats and houses outside the town centre due to the TRICS survey limitations.

For a number of land uses, there were no surveys available either for the required location or in general, and so alternative trip rates were used. Although not preferable, these substitutions were considered to represent the next best available trip rate for the land uses when no other options were available.

Table 4-6 summarises the updated trip rates used in the forecast demand modelling. Trip rates shown are for hourly AM and PM peak periods.

Land Use	Land Use	Units	Location	Sub-category		Trip Rates					
						AM Peak			PM Peak		
						Arrival	Departure	Total	Arrival	Departure	Total
Residential	C3	per dwelling	Town Centre	Flats	*Private*	0.023	0.056	0.079	0.048	0.02	0.068
Residential	C3	per dwelling	Town Centre	Flats	*Affordable*	0.023	0.056	0.079	0.048	0.02	0.068
Residential	C3	per dwelling	Edge of Town Centre	Flats	*Private*	0.043	0.189	0.232	0.17	0.082	0.252
Residential	C3	per dwelling	Edge of Town Centre	Flats	*Affordable*	0.074	0.105	0.179	0.087	0.087	0.174
Residential	C3	per dwelling	Suburban Area	Flats	*Private*	0.051	0.19	0.241	0.148	0.079	0.227
Residential	C3	per dwelling	Suburban Area	Flats	*Affordable*	0.091	0.155	0.246	0.127	0.182	0.309
Residential	C3	per dwelling	Neighbourhood Centre	Flats	*Private*	0.131	0.37	0.501	0.332	0.166	0.498
Residential	C3	per dwelling	Neighbourhood Centre	Flats	*Affordable*	0.131	0.37	0.501	0.332	0.166	0.498
Residential	C3	per dwelling	Town Centre	Houses	*Private*	unavailable in TRICs					
Residential	C3	per dwelling	Town Centre	Houses	*Affordable*	unavailable in TRICs					
Residential	C3	per dwelling	Edge of Town Centre	Houses	*Private*	0.138	0.291	0.429	0.283	0.17	0.453
Residential	C3	per dwelling	Edge of Town Centre	Houses	*Affordable*	0.078	0.094	0.172	0.133	0.102	0.235
Residential	C3	per dwelling	Suburban Area	Houses	*Private*	0.151	0.409	0.56	0.366	0.22	0.586
Residential	C3	per dwelling	Suburban Area	Houses	*Affordable*	0.186	0.276	0.462	0.436	0.34	0.776
Residential	C3	per dwelling	Neighbourhood Centre	Houses	*Private*	0.139	0.296	0.435	0.271	0.141	0.412
Residential	C3	per dwelling	Neighbourhood Centre	Houses	*Affordable*	0.077	0.219	0.296	0.19	0.116	0.306
Residential	C3-S	per resident	Edge of Town Centre	Student accommodation		0.004	0.002	0.006	0.002	0.007	0.009
Residential	C3-S	per 100sqm	Suburban Area	Student accommodation		2.128	1.064	3.192	1.064	3.191	4.255
Retail	Ea	per 100sqm	Town Centre	Convenience store		3.067	2.8	5.867	3.2	3.067	6.267
Retail	Ea	per 100sqm	Edge of Town Centre	Convenience store		2.941	0.980	3.921	2.451	2.941	5.392
Retail	Ea	per 100sqm	Suburban Area	Convenience store		9.493	9.817	19.31	8.091	8.091	16.182
Retail	Ea	per 100sqm	Neighbourhood Centre	Convenience store		6.406	6.156	12.562	8.108	8.709	16.817
Retail	Ea	per 100sqm	Suburban Area	Food superstore		1.517	1.295	2.812	2.001	2.217	4.218

Land Use	Land Use	Units	Location	Sub-category		Trip Rates					
						AM Peak			PM Peak		
						Arrival	Departure	Total	Arrival	Departure	Total
Retail	Ea	per 100sqm	Town Centre	Food superstore		3.887	3.085	6.972	5.746	5.014	10.760
Retail	Ea	per 100sqm	Neighbourhood Centre	Food superstore		2.508	2.071	4.579	4.563	4.401	8.964
Employment	B1a	per 100sqm	Town Centre	Office		0.637	0.122	0.759	0.061	0.345	0.406
Employment	B1a	per 100sqm	Edge of Town Centre	Office		0.921	0.142	1.063	0.101	0.713	0.814
Employment	B1a	per 100sqm	Suburban Area	Office		1.267	0.124	1.391	0.178	0.746	0.924
Employment	B1a	per 100sqm	Neighbourhood Centre	Office		1.085	0.075	1.16	0.05	1.062	1.112
Employment	B1a	per 100sqm	Suburban Area	Business Park		0.783	0.154	0.937	0.251	0.74	0.991
Employment	B2	per 100sqm	Town Centre	Industrial		0.18	0.024	0.204	0.004	0.085	0.089
Employment	B2	per 100sqm	Edge of Town Centre	Industrial		0.18	0.024	0.204	0.004	0.085	0.089
Employment	B2	per 100sqm	Suburban Area	Industrial		0.18	0.024	0.204	0.004	0.085	0.089
Employment	B2	per 100sqm	Neighbourhood Centre	Industrial		0.103	0.031	0.134	0.036	0.106	0.142
Employment	B8	per 100sqm	Town Centre	Warehouse-Storage		0.062	0.014	0.076	0.053	0.113	0.166
Employment	B8	per 100sqm	Edge of Town Centre	Warehouse-Storage		0.062	0.014	0.076	0.053	0.113	0.166
Employment	B8	per 100sqm	Suburban Area	Warehouse-Storage		0.062	0.014	0.076	0.053	0.113	0.166
Employment	B8	per 100sqm	Neighbourhood Centre	Warehouse-Storage		0.232	0.04	0.272	0.02	0.192	0.212
Employment	B8	per 100sqm	Suburban Area	Commercial Warehouse		0.027	0.018	0.045	0.035	0.021	0.056
Hotel-food-drink	A3	per 100sqm	Town Centre	Cafes		0.636	0	0.636	0	0.5	0.5
Hotel-food-drink	A3	per 100sqm	Suburban Area	Cafes		1.149	0	1.149	0	0	0
Hotel-food-drink	A3	per 100sqm	Neighbourhood Centre	Cafes		1.149	0	1.149	0	0	0
Hotel-food-drink	A3	per 100sqm	Town Centre	Restaurants		0	0	0	1.503	0.347	1.85
Hotel-food-drink	A3	per 100sqm	Edge of Town Centre	Restaurants		0	0	0	0.968	0.261	1.229
Hotel-food-drink	A3	per 100sqm	Suburban Area	Restaurants		0	0	0	1.340	0.515	1.855
Hotel-food-drink	A3	per 100sqm	Neighbourhood Centre	Restaurants		0	0	0	0.894	0.335	1.229

Land Use	Land Use	Units	Location	Sub-category		Trip Rates					
						AM Peak			PM Peak		
						Arrival	Departure	Total	Arrival	Departure	Total
Hotel-food-drink	A3	per 100sqm	Town Centre	Pub/Restaurants		0	0	0	0.824	1.059	1.883
Hotel-food-drink	A3	per 100sqm	Suburban Area	Pub/Restaurants		0.305	0	0.305	2.035	1.319	3.354
Hotel-food-drink	A3	per 100sqm	Neighbourhood Centre	Pub/Restaurants		0	0	0	2.438	1.343	3.781
Hotel-food-drink	A3	per 100sqm	Neighbourhood Centre	Fast food drive through		27.143	28.571	55.714	12.42	14.331	26.751
Hotel-food-drink	A3	per 100sqm	Neighbourhood Centre	Take away shop		0	0	0	3.774	5.66	9.434
Hotel-food-drink	A3	per 100sqm	Suburban Area	Take away shop		0	0	0	5.758	5.438	11.196
Hotel-food-drink	A3	per 100sqm	Edge of Town Centre	Take away shop		0	0	0	2.202	2.385	4.587
Hotel-food-drink	C1	per 100sqm	Suburban Area	Hotel		0.083	0.187	0.27	0.208	0.104	0.312
Hotel-food-drink	C1	per 100sqm	Edge of Town Centre	Hotel		0.349	0.232	0.581	0.211	0.243	0.454
Health	C2	per beds	Suburban Area	Care home		0.066	0.038	0.104	0.019	0.047	0.066
Health	C2	per beds	Neighbourhood Centre	Care home		0.064	0.064	0.128	0.037	0.048	0.085
Health	C2	per bed	Edge of Town Centre	Care home-specific condition		0.093	0.000	0.093	0.023	0.047	0.070
Health	Ee	per 100sqm	Suburban Area	Special doctor		unavailable in TRICs					
Health	Ee	per 100sqm	Town Centre	Dental surgery		1.600	0.800	2.400	0.000	1.600	1.600
Health	Ee	per 100sqm	Neighbourhood Centre	Dental surgery		1.667	0.000	1.667	0.000	0.000	0.000
Health	Ee	per 100sqm	Town Centre	Clinic		unavailable in TRICs					
Health	Ee	per 100sqm	Edge of Town Centre	Clinic		0.565	0.000	0.565	0.452	0.565	1.017
Education	F1a	per 100sqm	Edge of Town Centre	Primary school		4.504	2.832	7.336	0.084	0.212	0.296
Education	F1a	per 100sqm	Suburban Area	Primary school		3.212	2.902	6.114	0.072	0.238	0.31
Education	F1a	per 100sqm	Neighbourhood Centre	Primary school		5.178	4.355	9.533	0.164	0.424	0.588
Education	F1a	per 100sqm	Suburban Area	Nursery		1.896	1.272	3.168	1.387	2.035	3.422
Education	F1a	per 100sqm	Neighbourhood centre	Nursery		4.058	3.01	7.068	2.487	2.786	5.273
Education	F1a	per 100sqm	Edge of Town Centre	Nursery		4.333	5.333	9.666	3.333	3.667	7.000

Land Use	Land Use	Units	Location	Sub-category		Trip Rates					
						AM Peak			PM Peak		
						Arrival	Departure	Total	Arrival	Departure	Total
Leisure	Ed	per 100sqm	Suburban Area	Fitness club		26.966	10.112	37.078	73.034	49.438	122.472
Leisure	Ed	per 100sqm	Neighbourhood Centre	Play centre		unavailable in TRICs					
Leisure	F2c	per hectares	Town Centre	Country Park		0.34	0.062	0.402	0.081	0.195	0.276
Leisure	F2c	per hectares	Neighbourhood Centre	Country Park		0.34	0.062	0.402	0.081	0.195	0.276
Leisure	F2c	per hectares	Edge of Town Centre	Country Park		0.34	0.062	0.402	0.081	0.195	0.276
Leisure	F2c	per hectares	Suburban Area	Country Park		0.34	0.062	0.402	0.081	0.195	0.276
Leisure	Ed	per 100sqm	Edge of Town Centre	Leisure centre		17.957	13.131	31.088	35.915	36.251	72.166
Leisure	Ed	per 100sqm	Neighbourhood Centre	Leisure centre		17.957	13.131	31.088	35.915	36.251	72.166
Leisure	Ed	per 100sqm	Suburban Area	Leisure centre		17.957	13.131	31.088	35.915	36.251	72.166
Leisure	Ed	per 100sqm	Edge of Town Centre	Fitness club		33.333	25.000	58.333	97.222	58.333	155.555
Leisure	Ed	per 100sqm	Neighbourhood Centre	Fitness club		17.978	19.101	37.079	57.303	48.876	106.179
Leisure	F1f	per 100sqm	Suburban Area	Place of worship		unavailable in TRICs					
Leisure	F1f	per 100sqm	Neighbourhood Centre	Place of worship		unavailable in TRICs					
Leisure	F2b	per 100sqm	Edge of Town Centre	Community centre		32.432	0.000	32.432	51.351	21.622	72.973
Car Showroom	SG	per 100sqm	Suburban Area	Car showroom		1.711	0.589	2.300	0.370	1.465	1.835
Car Showroom	SG	per 100sqm	Edge of Town Centre	Car showroom		0.675	0.096	0.771	0.096	0.386	0.482
Vehicle Services		site area	Suburban Area	Car wash		36.066	24.59	60.656	54.098	78.689	132.787
Vehicle Services		no of bays	Suburban Area	Car wash		0.947	0.632	1.579	1.211	1.632	2.843
Petrol Filling Station		site area	Town Centre	Petrol filling station		unavailable in TRICs					
Golf	F2c	per hectares	Suburban Area	Golf		1.272	0.289	1.561	1.618	1.792	3.410

Table 4-6: TRICS Trip Rates per Time Period

4.4.6 Trip Distribution

For each development zone, a donor zone from the base year was chosen to duplicate its trip pattern. The selected donor zone was one that shared the same land use as the proposed development zone, and it was located in reasonable proximity to the zone. This process was undertaken in order to replicate the trip distribution of the developments' zones. This also allowed the future land use of zones to be robustly modelled once the matrix furnessing had been applied. The AM and PM development OD trips developments were divided between purposes based on the donor zone purpose proportion.

4.4.7 Good Vehicle Growth Factors

General growth in LGV and HGV demand has been produced using the growth factors derived from the National Road Traffic Projections (NRTP) 2022 published by DfT. The NRTP22 traffic mileage data for all road types was extracted from the Core scenario for LGV and HGV and then interpolated to derive growth factors for 2042 from 2019. The resulting growth factors are shown in Table 4-7 and applied at an assignment (peak hour) matrix level.

Region	2019 – 2042 Growth Factor	
	LGV	HGV
East Midlands	1.35	1.10
Eastern England	1.34	1.13
London	1.32	1.08
North East	1.37	1.08
North West	1.31	1.11
South East	1.36	1.14
South West	1.31	1.08
West Midlands	1.37	1.11
Yorks & Humber	1.31	1.11
Wales	1.32	1.08
Scotland	-	-

Table 4-7: 2042 LGV and HGV Factors

4.4.8 Forecast Baseline Total Matrix

Table 4-8 provides a summary of highway matrix trip totals at the peak hour level for each highway assignment user class and the percentage change between base and forecast scenarios totals.

Time Period	Segment	Base (2019)	Forecast Baseline (2042)		
		Matrix Total	Matrix Total	Difference to Base	% Difference to Base
AM Peak	Car Commute	136,411	157,340	21,228	15%
	Car Employers' Business	42,159	49,112	7,077	16%
	Car Other	125,705	163,062	37,706	30%
	LGV	225,684	303,378	77,694	34%
	HGV	44,426	50,032	5,606	13%
	Total	574,385	722,924	149,311	26%
PM Peak	Car Commute	118,816	136,821	17,901	15%
	Car Employers' Business	40,842	47,461	6,603	16%
	Car Other	201,015	246,625	45,470	23%
	LGV	189,199	254,458	65,259	34%
	HGV	28,583	32,153	3,570	12%
	Total	578,455	717,518	138,803	24%

Table 4-8: 2019 Base and 2042 Forecast Baseline Matrices Comparison

5. Forecast Results

5.1 Overview

This section describes the forecast results for the Forecast Baseline scenario. A set of output plots have been produced to show the flow difference, junction level of service, and change in travel time in order to help identify key "hot-spot" areas from additional growth and developments in the 2042 Forecast Baseline.

5.2 Forecasts Baseline Results

5.2.1 Flow Difference Plots

Flow difference plots have been produced to show the difference in actual flows between the 2042 Forecast Baseline and 2019 Base models. These are presented in Figure 5-1 to Figure 5-8.

Comparing the 2042 and 2019 models, increase in traffic is predicted along major corridors such as M25, M20, M26 and A21 with a difference of approximately 500 to 1500 vehicles. These are then followed by increases of around 50 to 200 vehicles predicted along A224 London Road, Shoreham Road, A224 Orpington By-Pass, A225 Dartford Road, B262 Station Road A225 Sevenoaks Road, A25 Westerham Road, A25 Bradbourne Vale Road, A25 Seal Road and in local roads around the town centre in Swanley, Sevenoaks and Edenbridge.

The inclusion of the LTC in the forecast baseline increases the flows using M2 as traffic reroutes from M20. The traffic flows have also reduced along A2 as the traffic rerouting from Dartford Crossing to LTC.

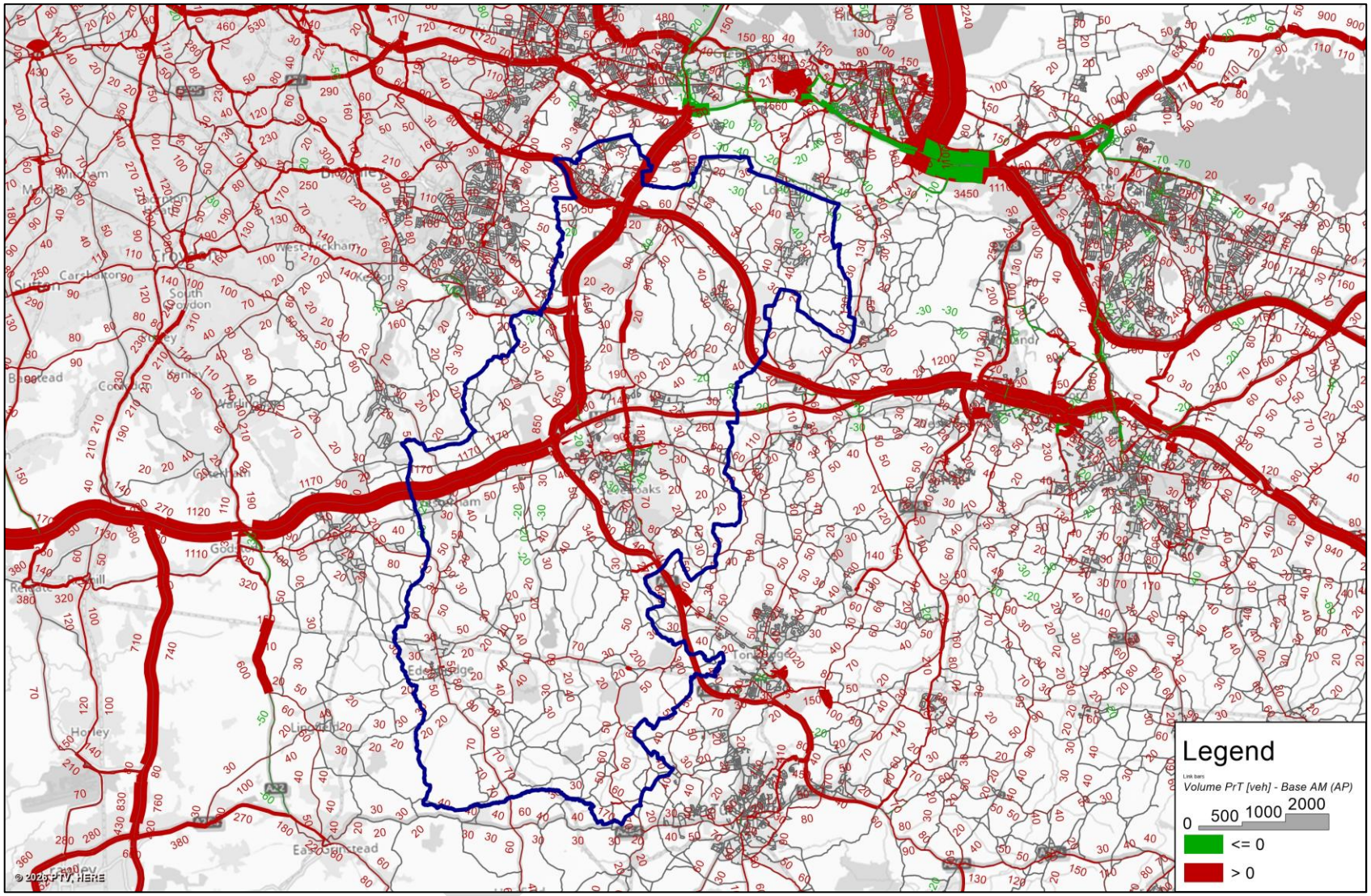

Figure 5-1 – 2042 vs 2019 Flow Difference AM Peak – Sevenoaks District

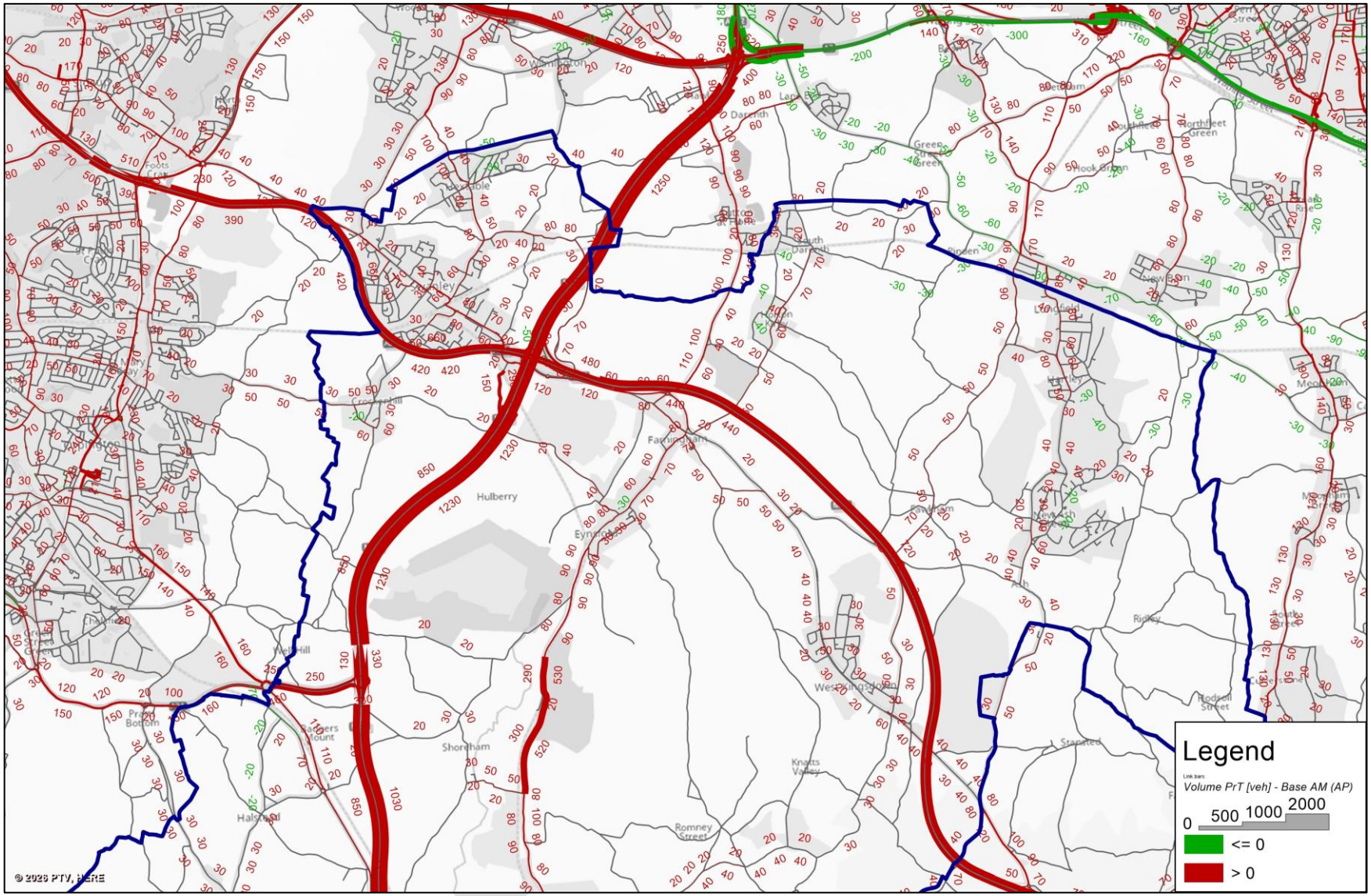

Figure 5-2 – 2042 vs 2019 Flow Difference AM Peak – Swanley, Eynsford, New Ash Green and Halstead

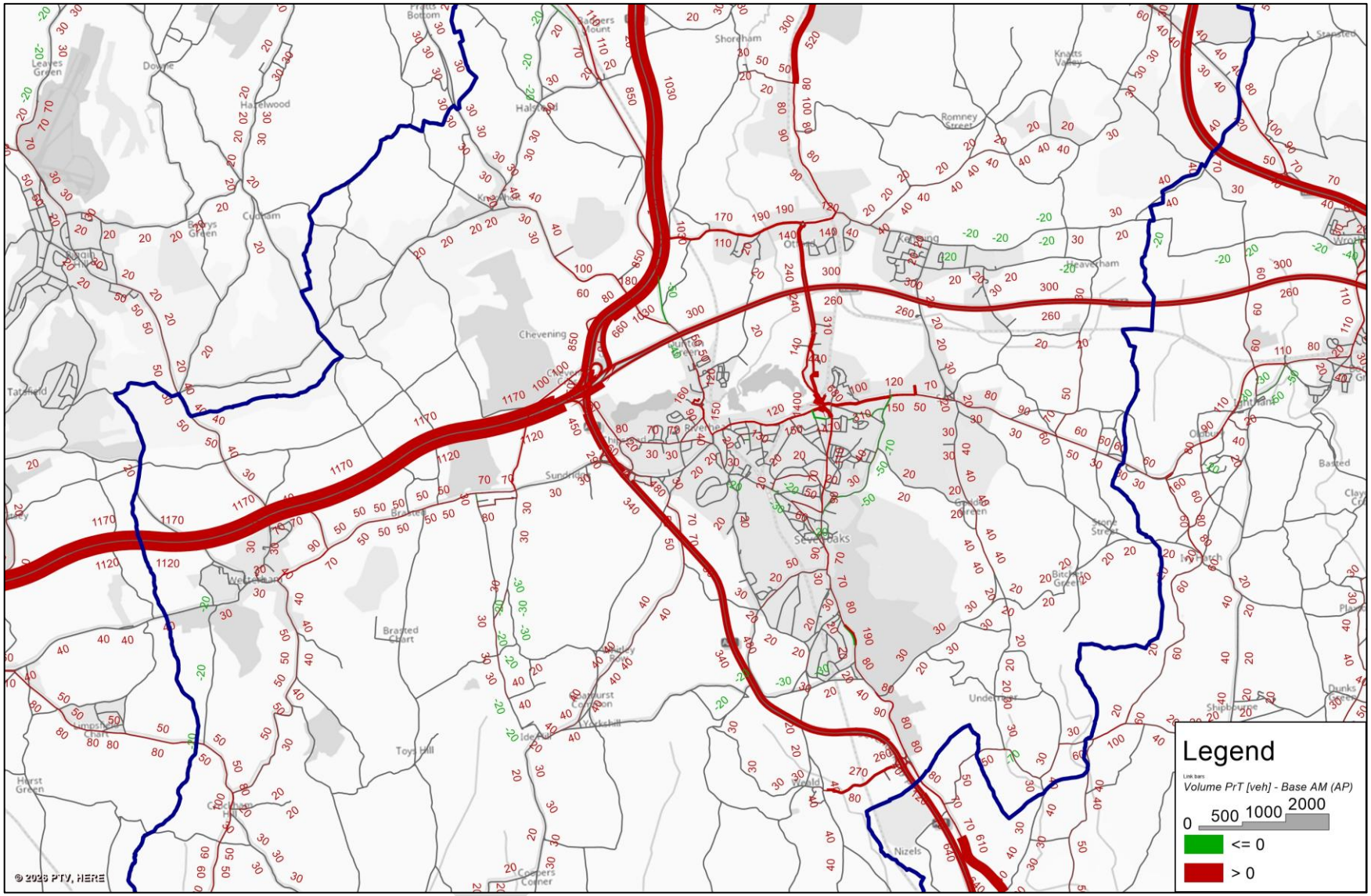

Figure 5-3 – 2042 vs 2019 Flow Difference AM Peak – Sevenoaks Town and Otford

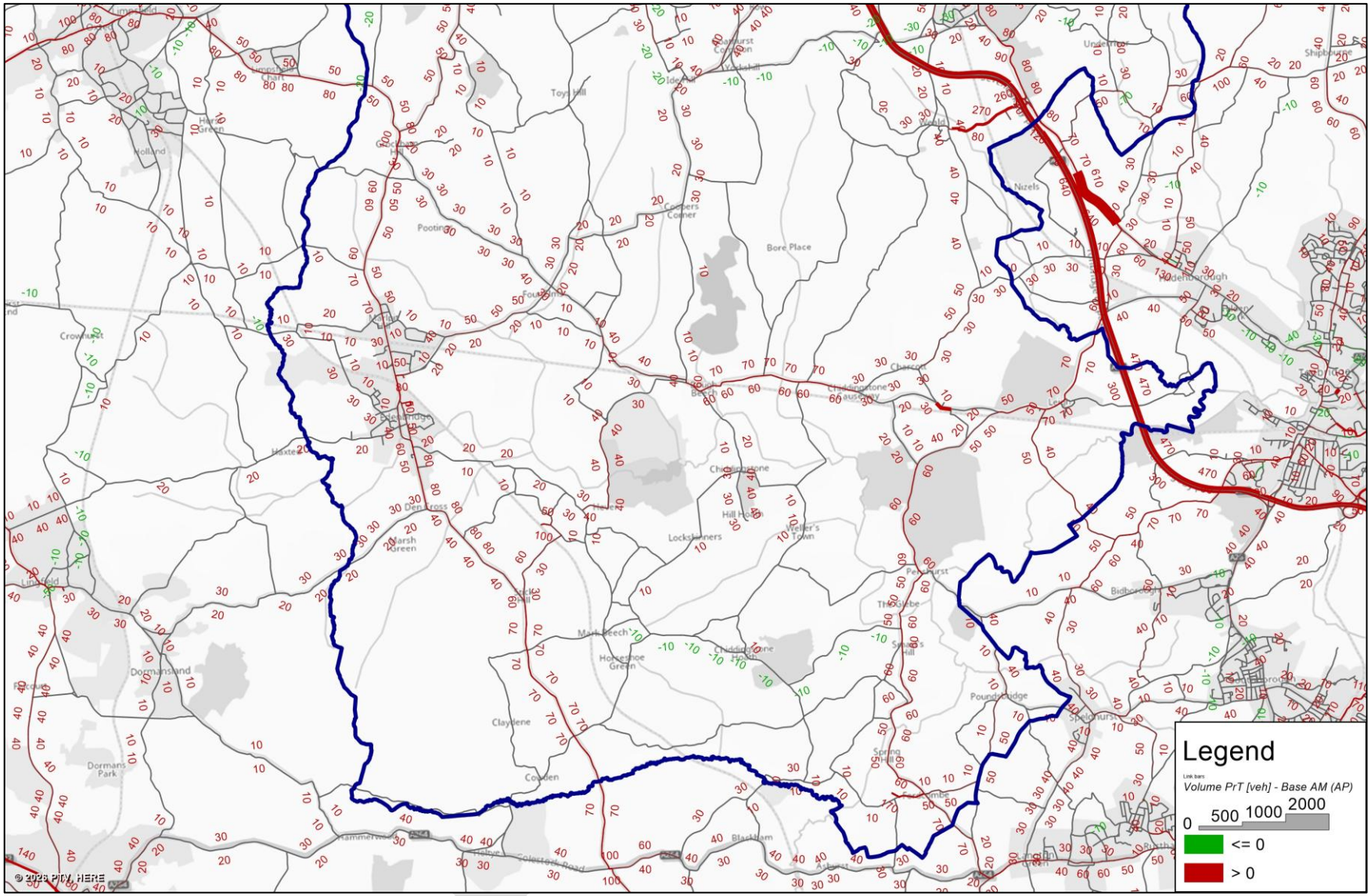

Figure 5-4 – 2042 vs 2019 Flow Difference AM Peak – Edenbridge

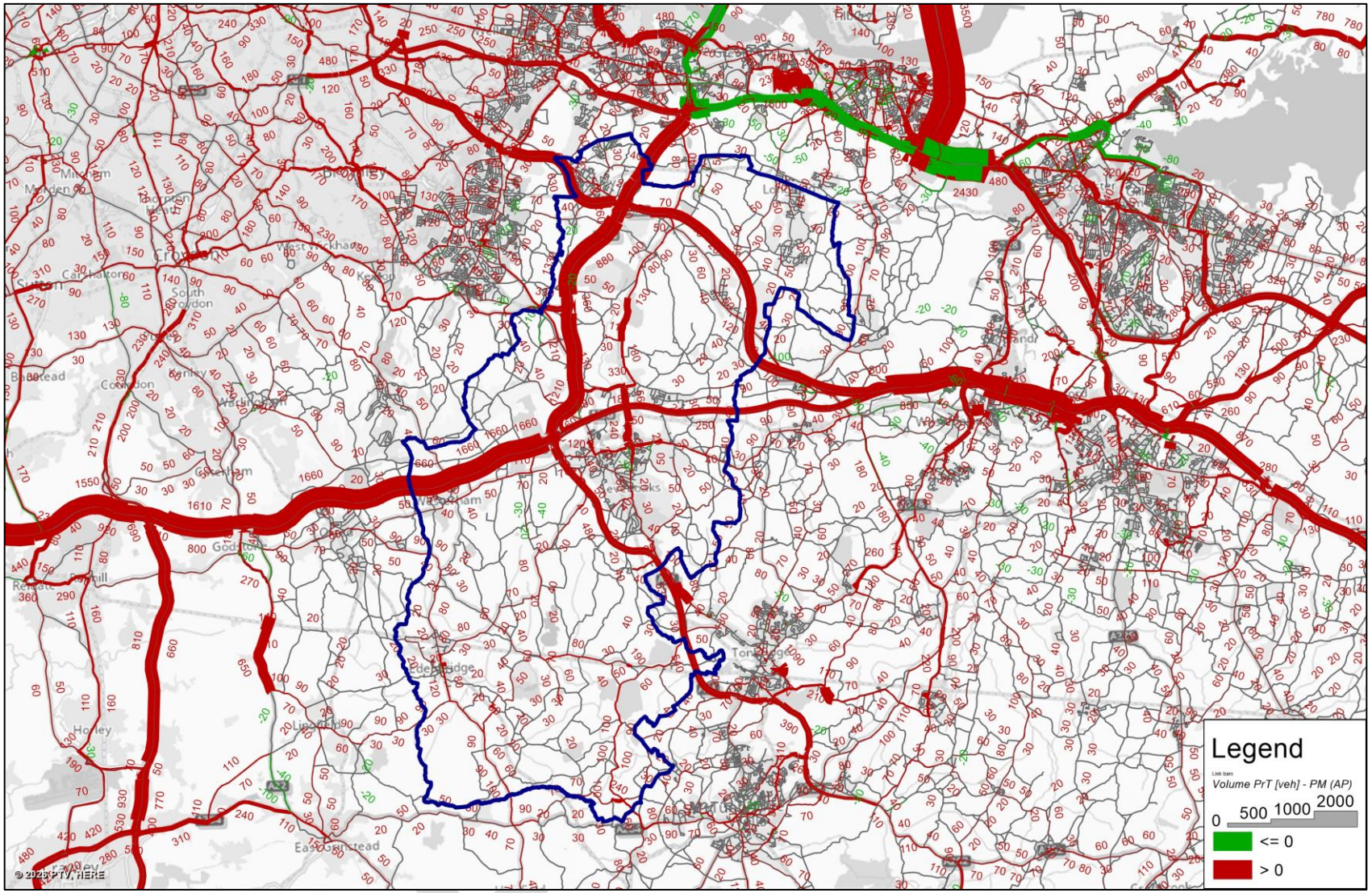

Figure 5-5 – 2042 vs 2019 Flow Difference PM Peak – Sevenoaks District

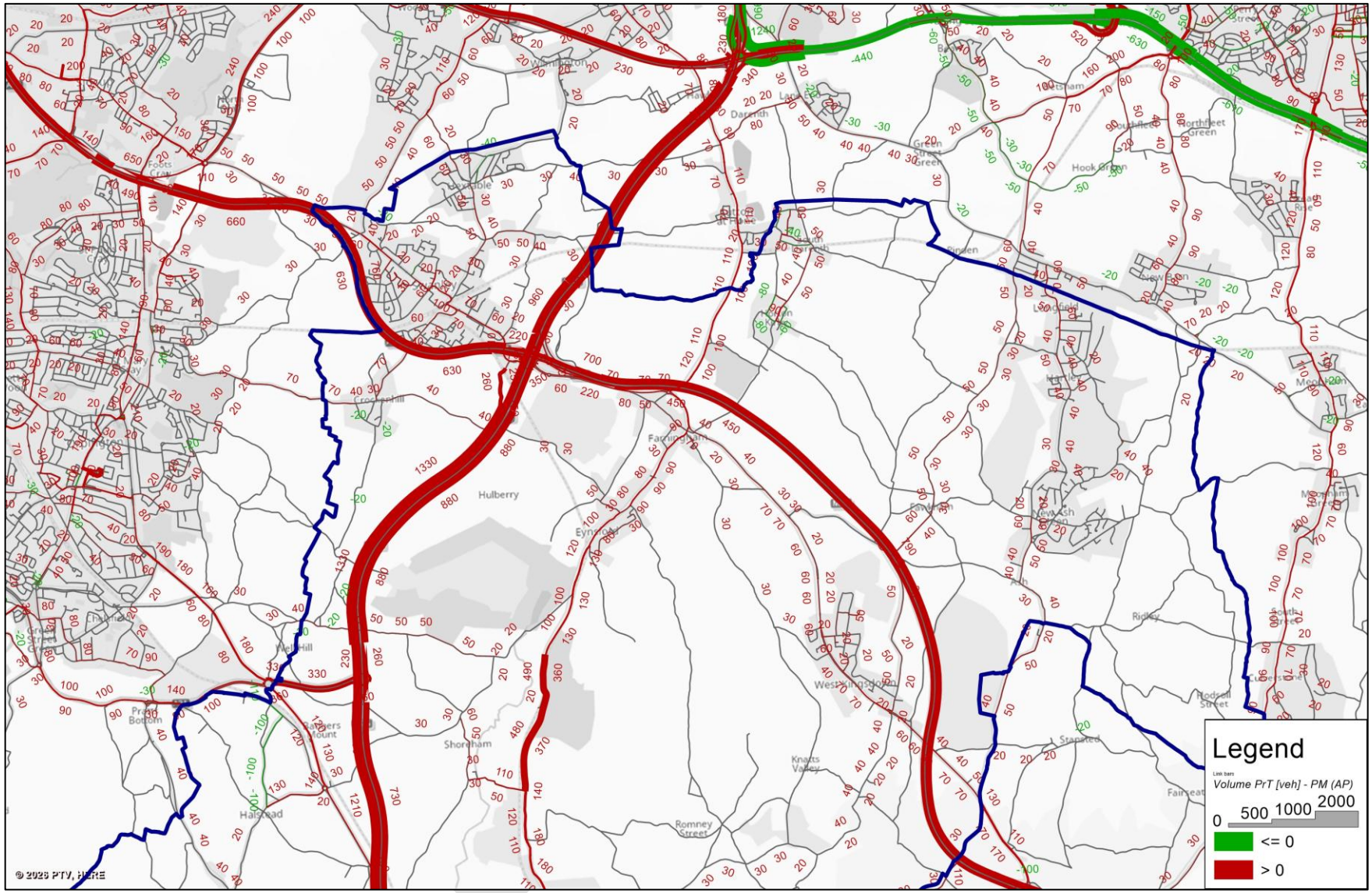

Figure 5-6 – 2042 vs 2019 Flow Difference PM Peak – Swanley, Eynsford, New Ash Green and Halstead

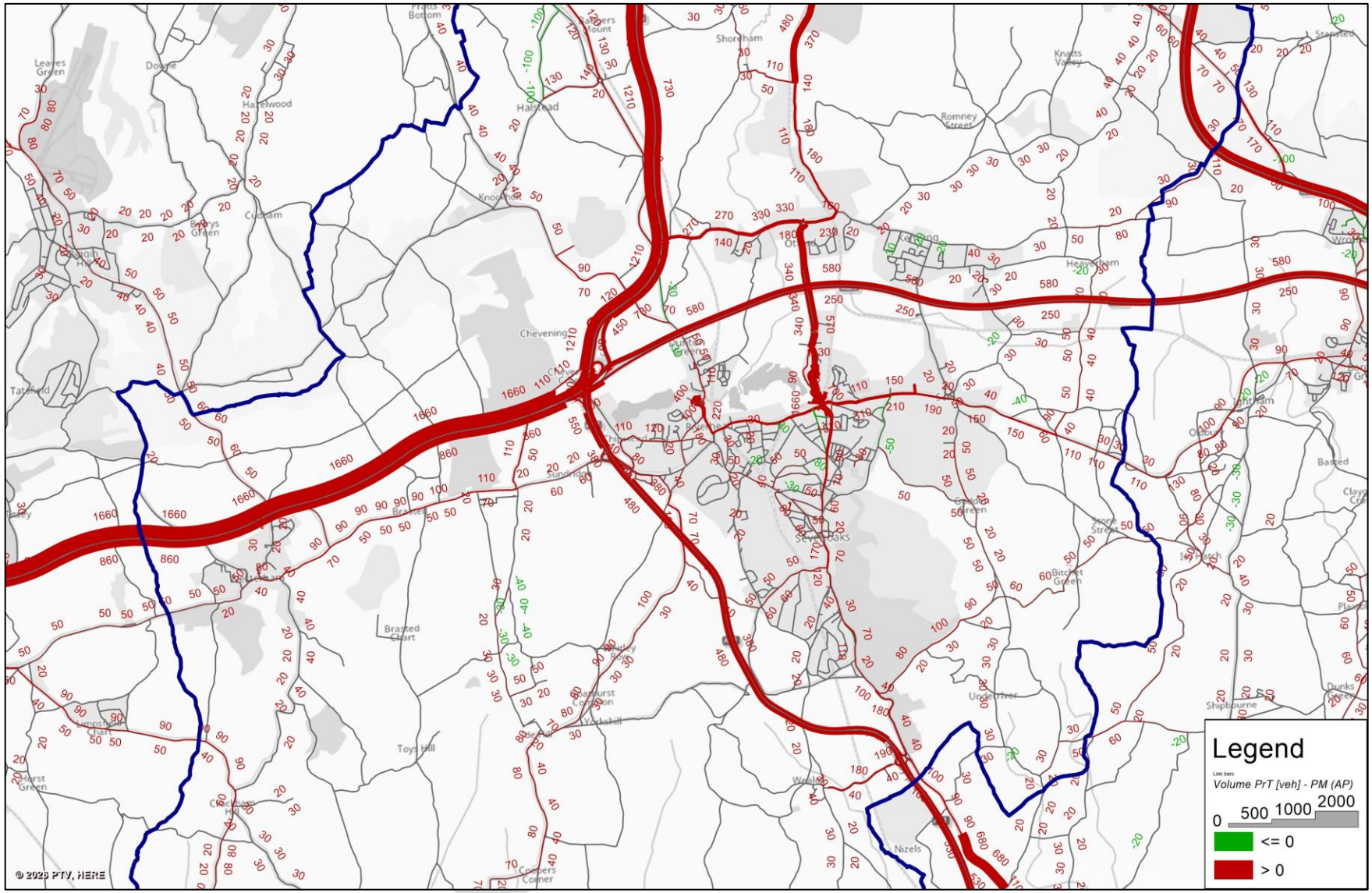

Figure 5-7 – 2042 vs 2019 Flow Difference PM Peak – Sevenoaks Town and Otford

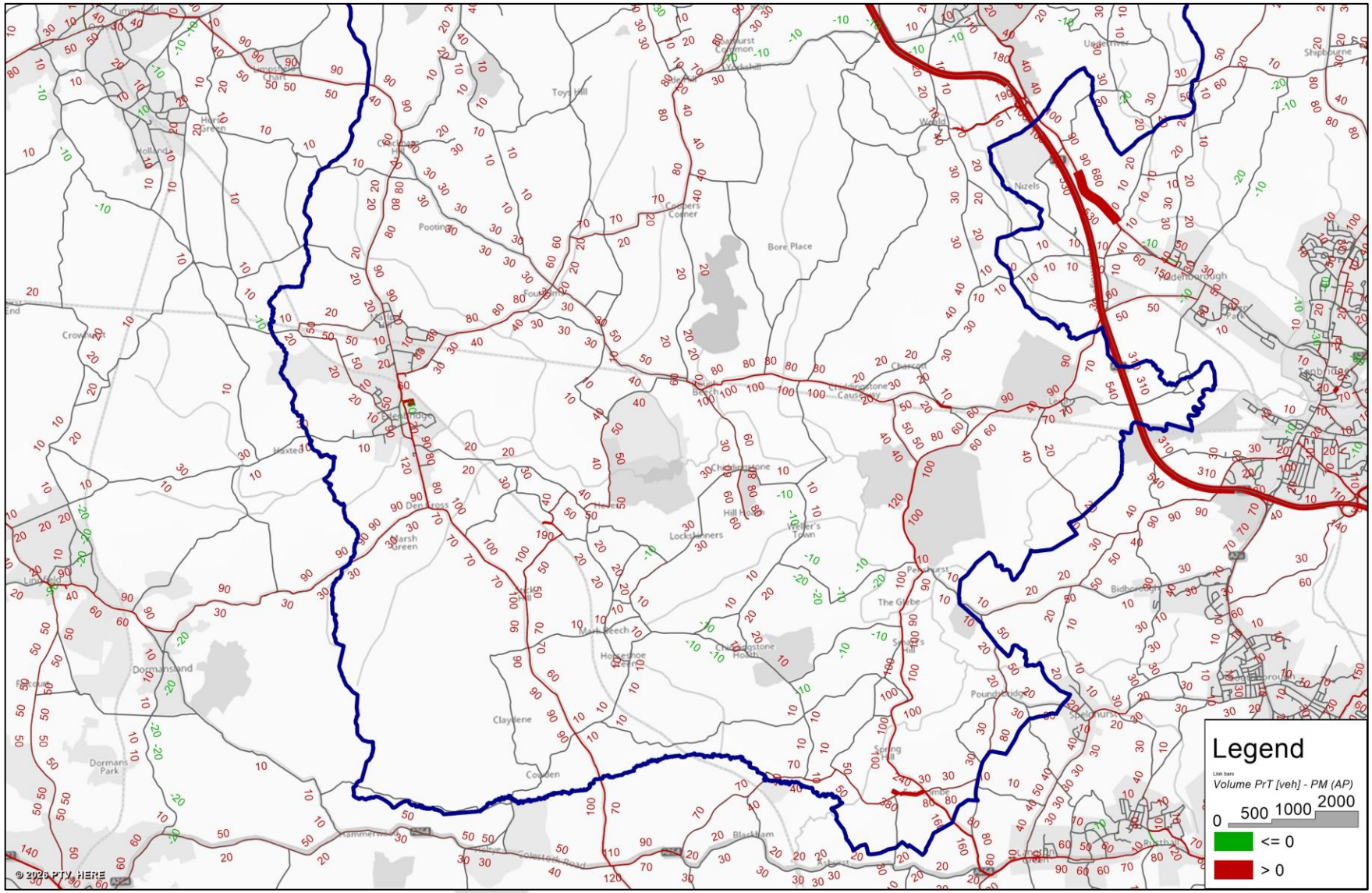

Figure 5-8 – 2042 vs 2019 Flow Difference PM Peak – Edenbridge

5.2.2 2042 Junction and Link "Hot Spots"

Figures 5-9 to 5-15 show the junction LOS and link V/C ratios for the 2042 Forecast Baseline AM and PM peak periods and are summarised in Table 5-1.

Most of the junction and link "hot spots" identified in the 2019 Base Model also exist in the 2042 Forecast Baseline. However, a number of additional junctions and links in the 2042 Forecast Baseline scenario are projected to operate under more constrained conditions. These locations exhibit LOS E or F and/or V/C ratios exceeding 85%, with some links deteriorating compared to the 2019 Base conditions. This worsening performance is primarily attributable to anticipated traffic growth by 2042, driven by committed developments as well as background growth.

In the northern part of the district, covering Swanley, Eynsford, New Ash Green and Halstead, sections of Bartholomew Way and High Street in Swanley are forecast to experience additional capacity constraints, with V/C ratios exceeding 100% in the 2042 Forecast Baseline. In addition, sections of the M25 between Junctions 3 and 4, as well as the A20 Main Road in Farningham, are expected to come under increasing pressure, with V/C ratios exceeding 85%, indicating emerging capacity constraints.

Within Sevenoaks Town and Otford, several junctions that previously operated at LOS E in the 2019 Base are projected to degrade further to LOS F by 2042. Furthermore, a number of new junction hotspots are identified along Westerham Road and Worships Hill, where LOS E conditions are anticipated. The improvement at the A25/Otford Road/St John's Hill junction is attributed to the proposed committed scheme to convert the junction into a roundabout.

In Edenbridge, a similar pattern is observed, with many of the junction hotspots identified in the 2019 Base persisting into the 2042 Forecast Baseline, indicating limited resilience in the network to accommodate future traffic growth.

Area		Road /Junction	2019 Base	2042 Forecast Baseline
Swanley, Eynsford, New Ash Green and Halstead	V/C >85%	Bartholomew Way	>85%	>100%
		High Street	>85%	>100%
		M25 between J3 and J4 Southbound	-	>85%
		A20 Main Road	-	>85%
	LOS E or F	High Street/St Georges Road	E	E
		M25 J3	F	E
		Hewitts Roundabout	F	F
Sevenoaks Town, and Otford	LOS E or F	A25 / Bradbourne Road	E	F
		Seal Road/Filmer Lane/ Seal Hollow Road	E	F
		Westerham Road/Larkfield Road	E	F
		A25 / Otford Road / St Johns Hill	F	A
		High Street/Pembroke Road	F	F
		Westerham Road/ A21 Onslip SB	F	F
		Station Road / Shoreham Road / Pilgrims Way E	E	E
		Westerham Road / Cold Arbor Road	-	E
		Worship Road / Witches Lane	-	E
		A25 London Road / Maidstone Road	-	E
		Morleys Roundabout	-	E
Edenbridge	LOS E or F	Mont St Aignan Way/Lingfield Road	F	F
		Mont St Aignan Way/Stangrove Road	F	F
		B2026 Station Road/High Street	E	E

Table 5-1: 2042 Forecast Baseline List of Junction and Link "Hot Spots"

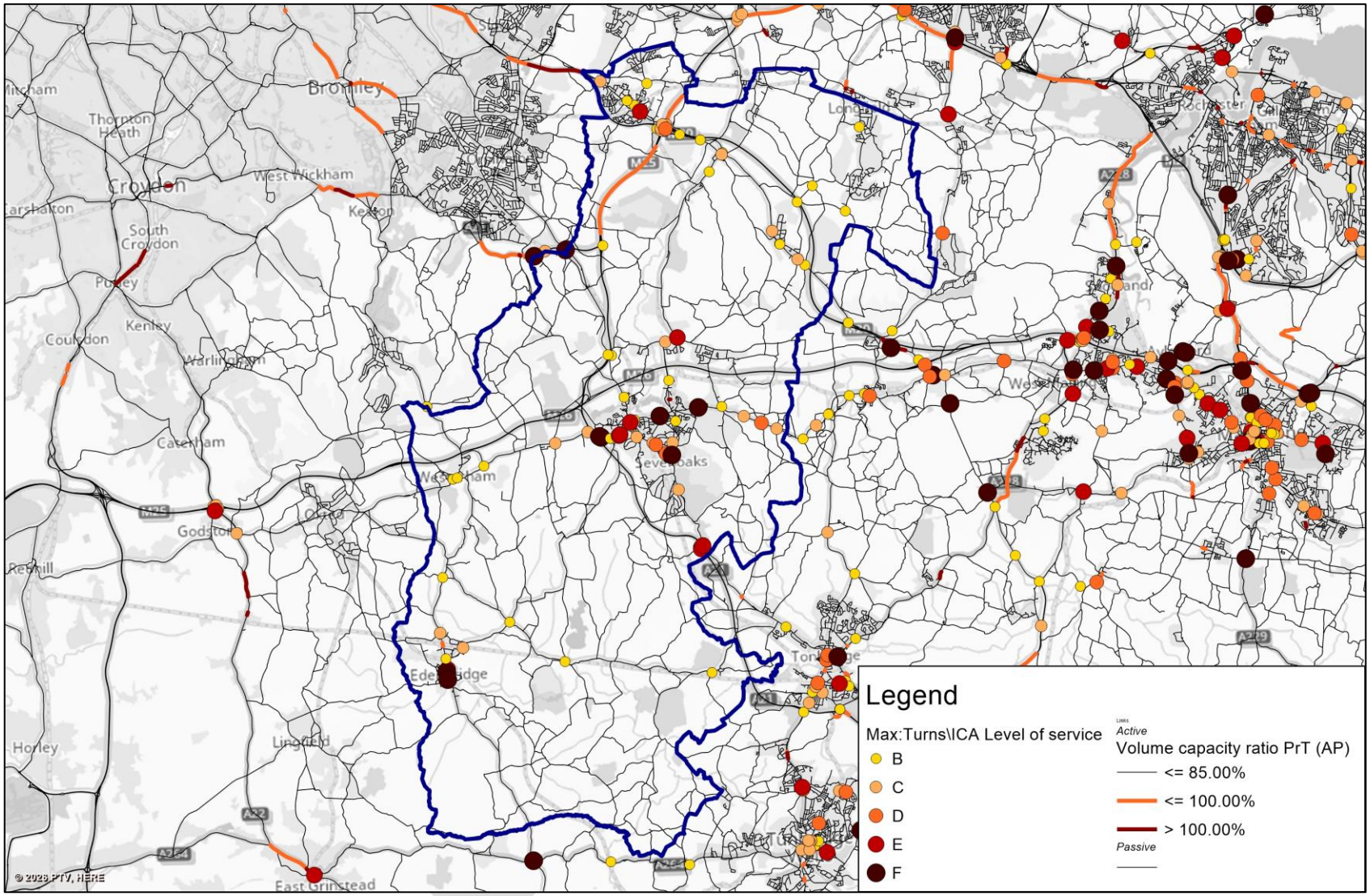

Figure 5-9: 2042 AM Peak Junction LOS and Link "Hot Spots" – Sevenoaks District

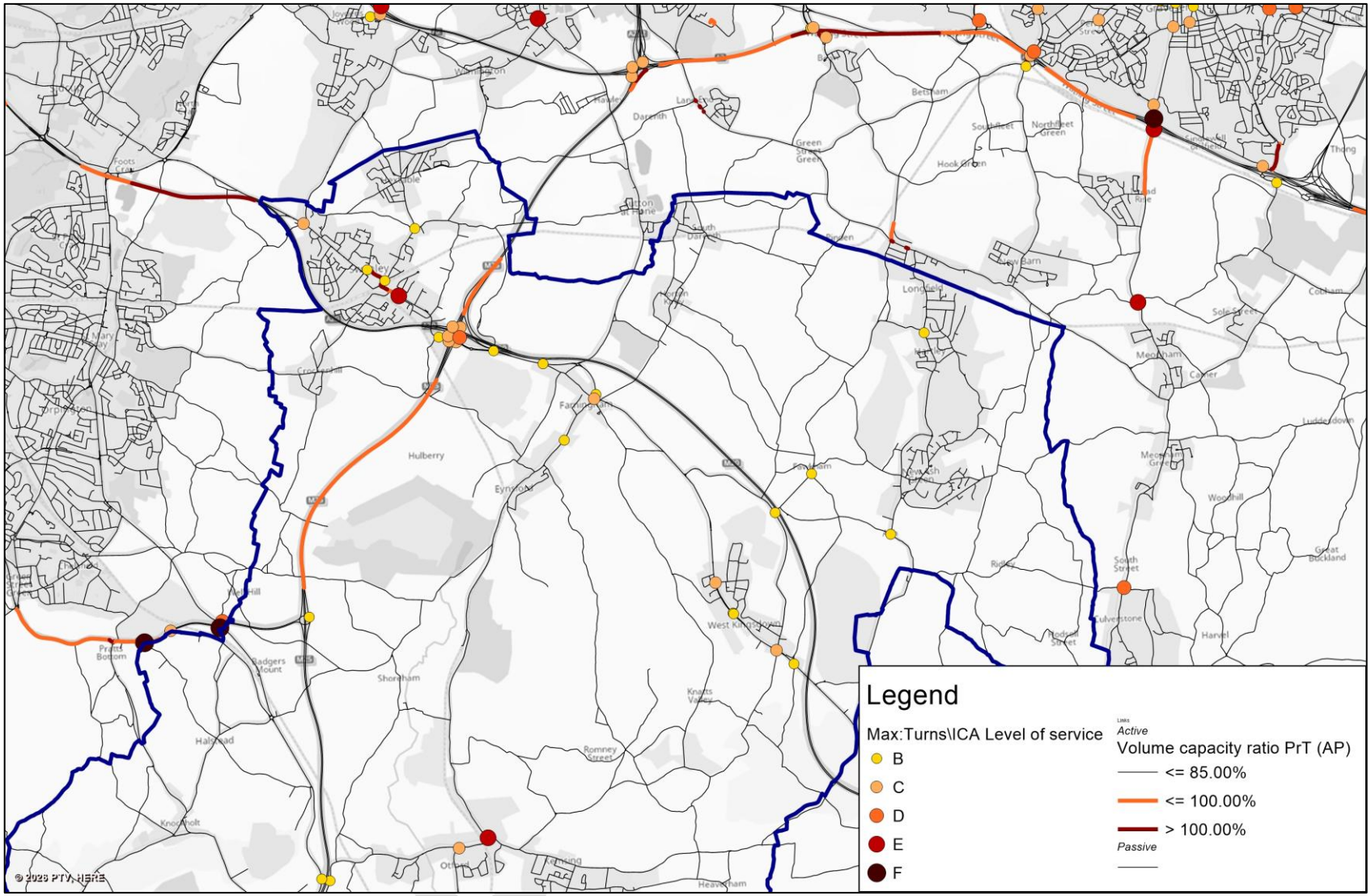

Figure 5-10: 2042 AM Peak Junction LOS and Link "Hot Spots" – Swanley, Eynsford, New Ash Green and Halstead

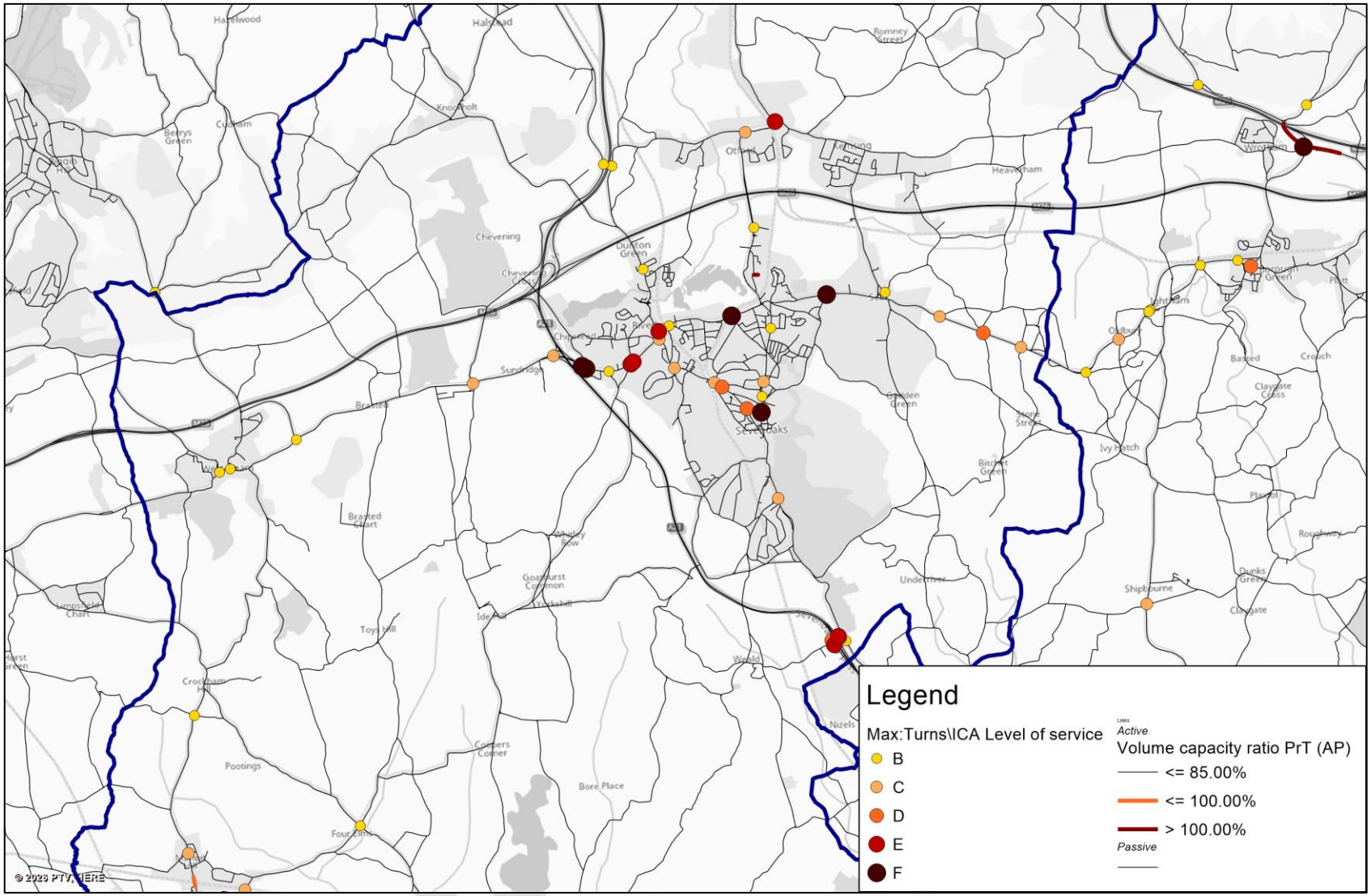

Figure 5-11: 2042 AM Peak Junction LOS and Link "Hot Spots" – Sevenoaks Town and Otford

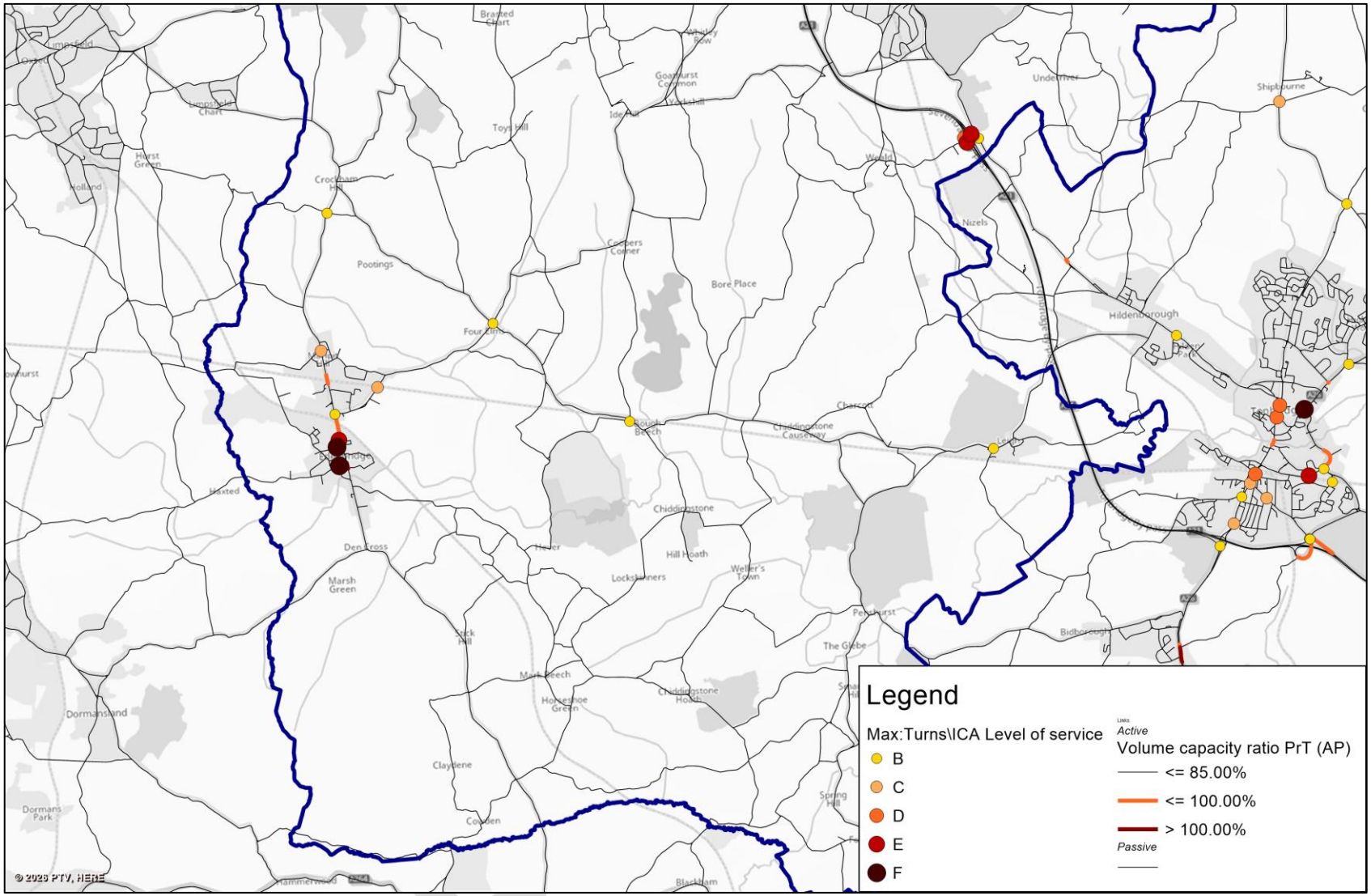

Figure 5-12: 2042 AM Peak Junction LOS and Link "Hot Spots" – Edenbridge

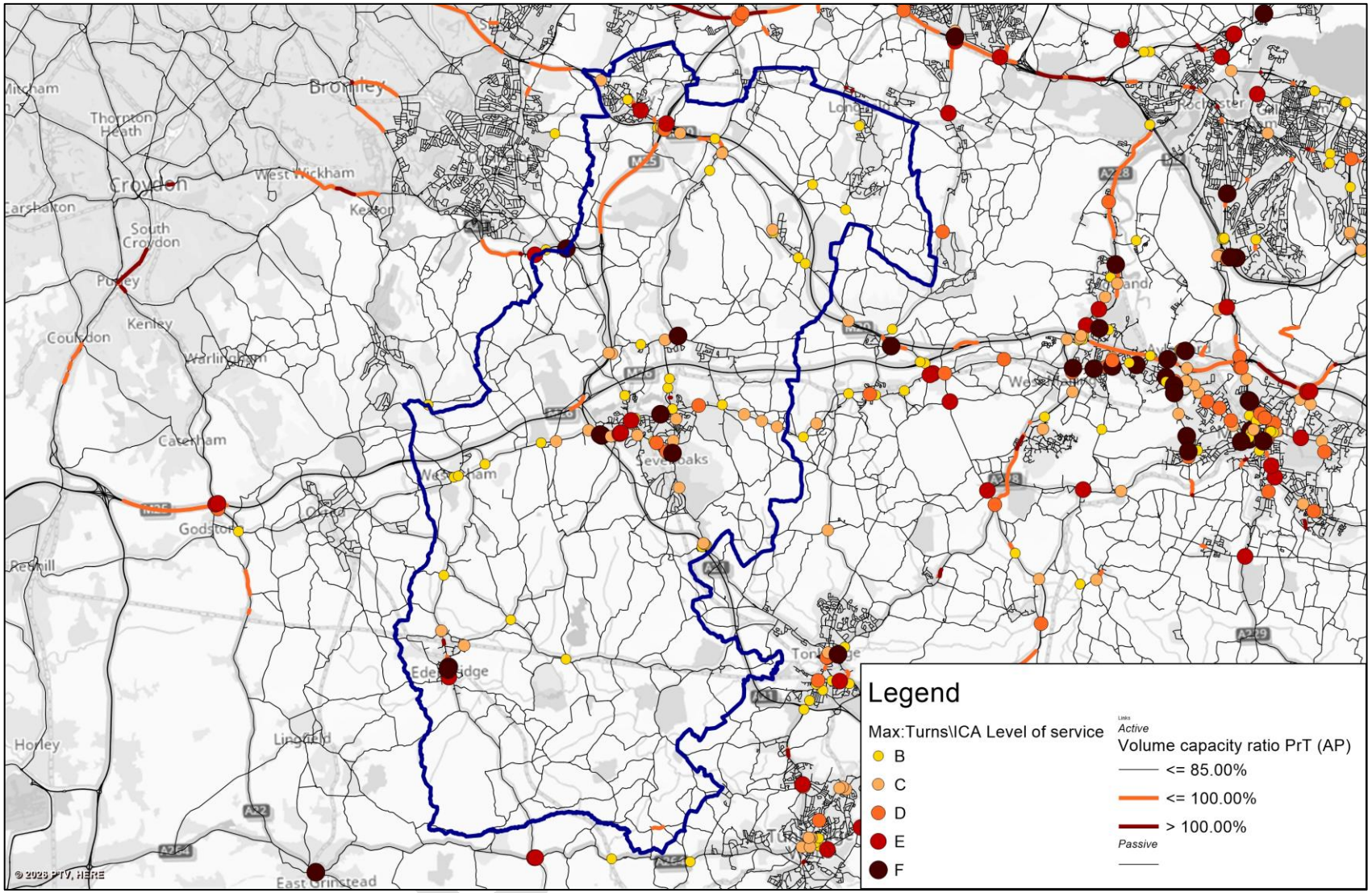

Figure 5-13: 2042 PM Peak Junction and Link "Hot Spots" – Sevenoaks District

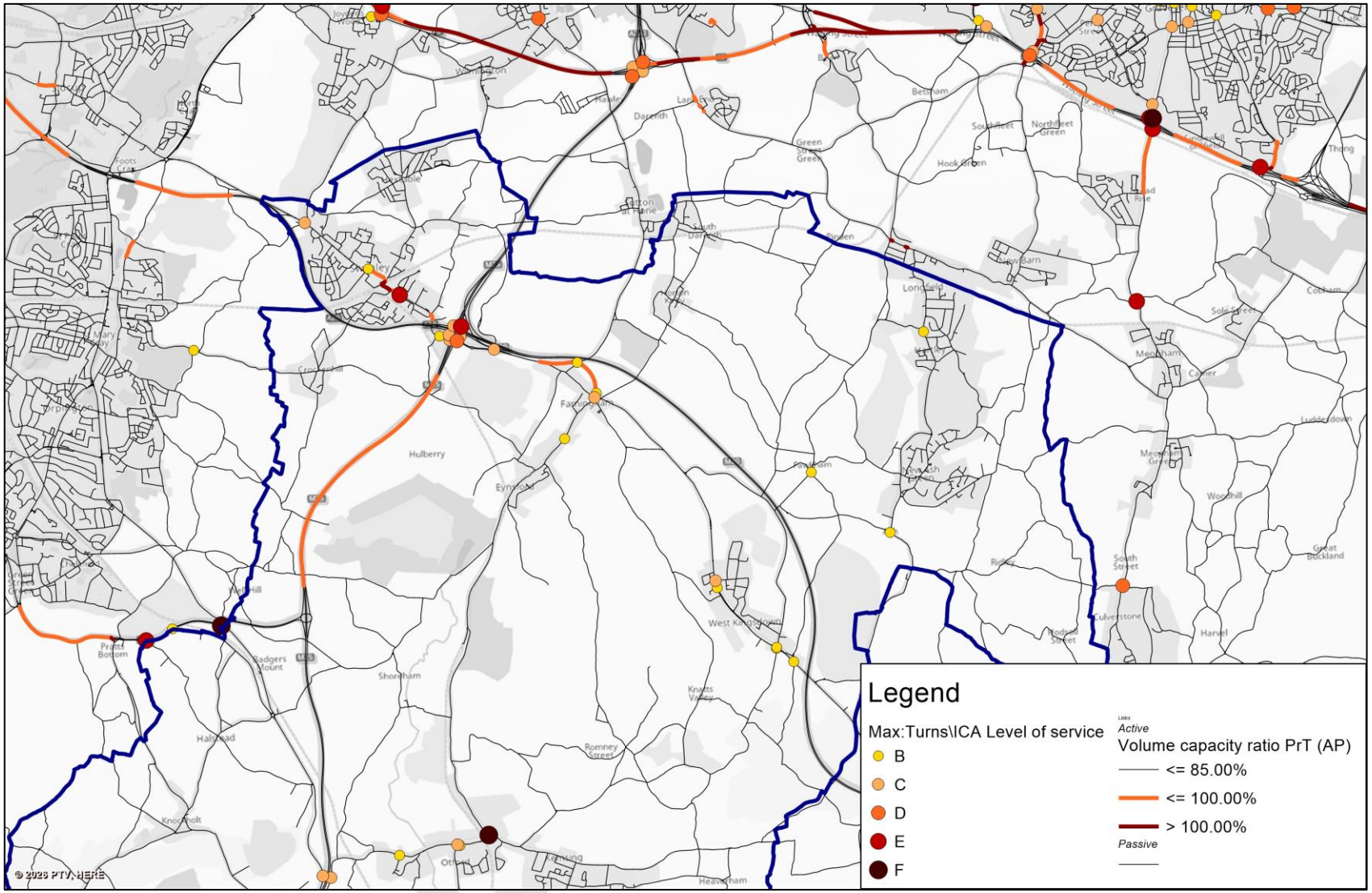

Figure 5-14: 2042 PM Peak Junction and Link "Hot Spots" – Swanley, Eynsford, New Ash Green and Halstead

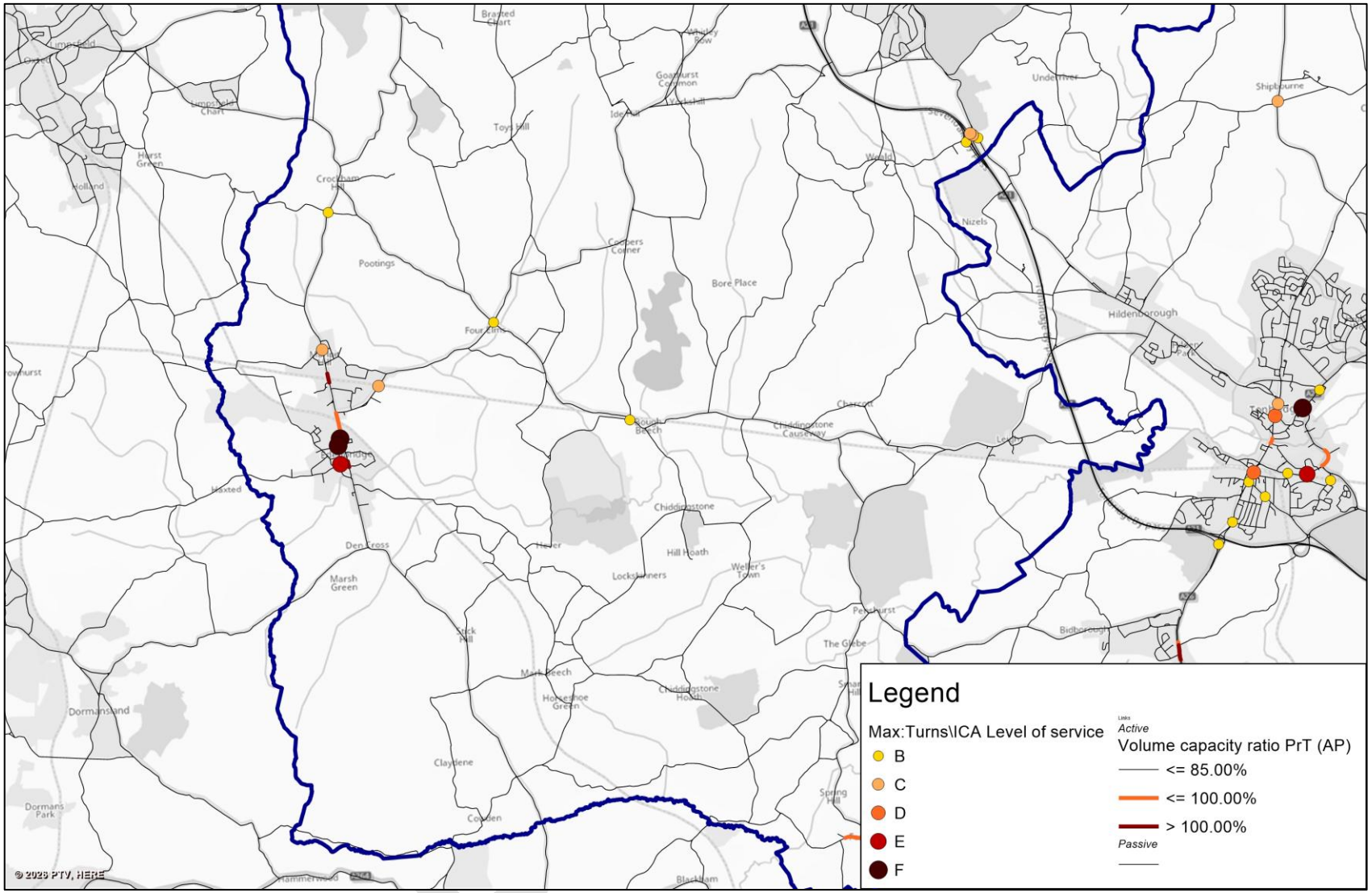

Figure 5-15: 2042 PM Peak Junction and Link "Hot Spots" – Edenbridge

5.2.3 Journey Time Comparison

This section focuses on the journey time comparison for local routes in Sevenoaks District between the 2042 Forecast Baseline and the 2019 Base.

It should be noted that, for the purpose of capturing specific delays at certain junctions, a few routes were modified and added. Figure 5-16 shows the journey time routes included in the base model validation. Among these routes, the following have been modified:

- Route 2: B2173 London Road – extended to M25 Junction 2 to capture any potential travel time impacts between B2173 and the M25 via M25 Junction 3.
- Route 5: A20 Main Road / Gorse Hill – extended to the A20 in Swanley to capture any potential travel time impacts between A20 Main Road / Gorse Hill and the A20 via M25 Junction 3.
- Route 6: Shoreham Road and Route 11: A225 Sevenoaks Road / High Street – combined to capture any potential travel time impacts at the junctions of A225 Sevenoaks Road / High Street / A226 Station Road and A225 Shoreham Road / Pilgrims Way East / A225 Station Road.
- Route 8: A25 Brasted Road and Route 9: A25 Bradbourne Vale Road / Seal Road – combined to capture any potential travel time impacts at the junctions of Amherst Hill / A25 Worship Hill / A25 London Road and A25 London Road / A224 London Road / A25 Maidstone Road.

It is acknowledged that the above changes were not part of the base model validation. However, only short sections were added to each route, and therefore no material impact on the travel time estimation is expected. As mentioned above, the main purpose of this update is to capture potential travel time impacts at key junctions located near proposed site allocations.

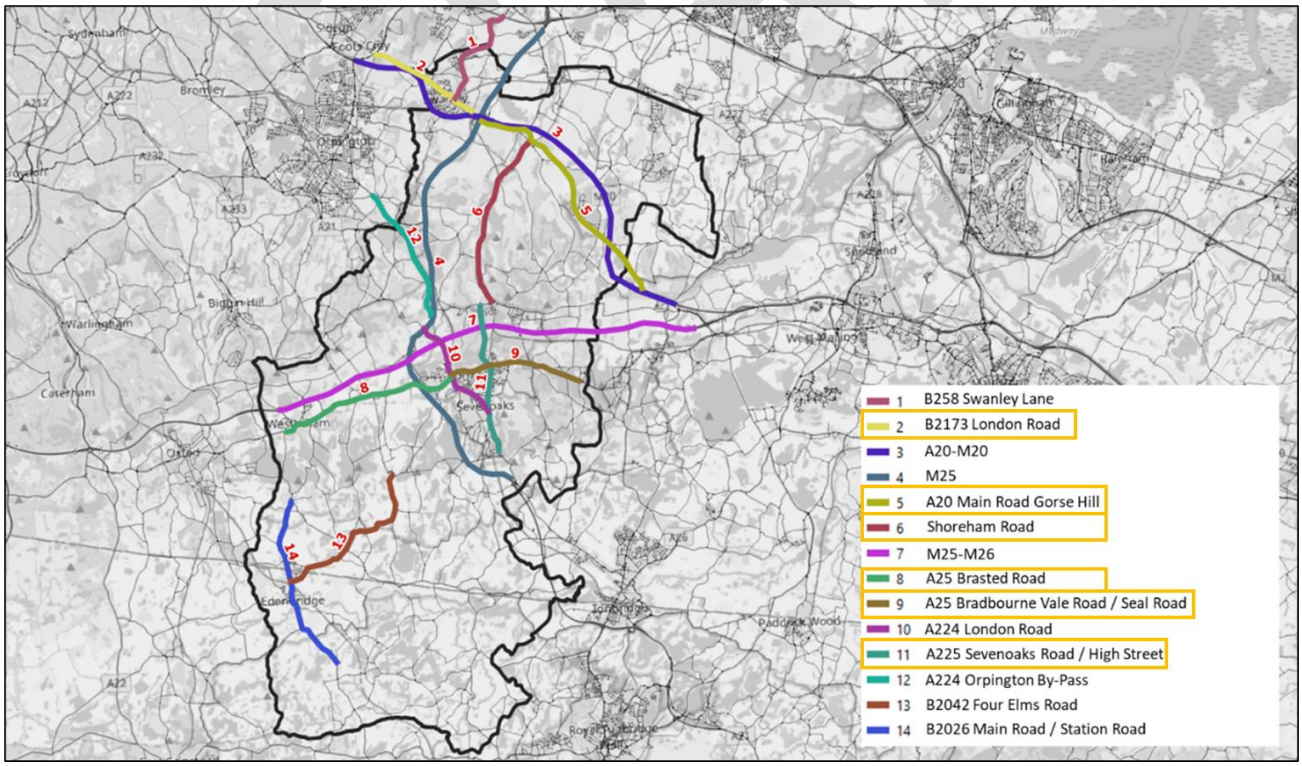

Figure 5-16: Journey Time Routes in Sevenoaks

Figure 5-17 shows the updated journey time routes incorporating the changes above. In addition, two new routes were added to capture the travel time impact in the northern part of the district. These include Route 13 via A225 Dartford Road, B262 Station Road and Hall Road and Route 14 via Ash Road, B26 Station Road and Hall Road.

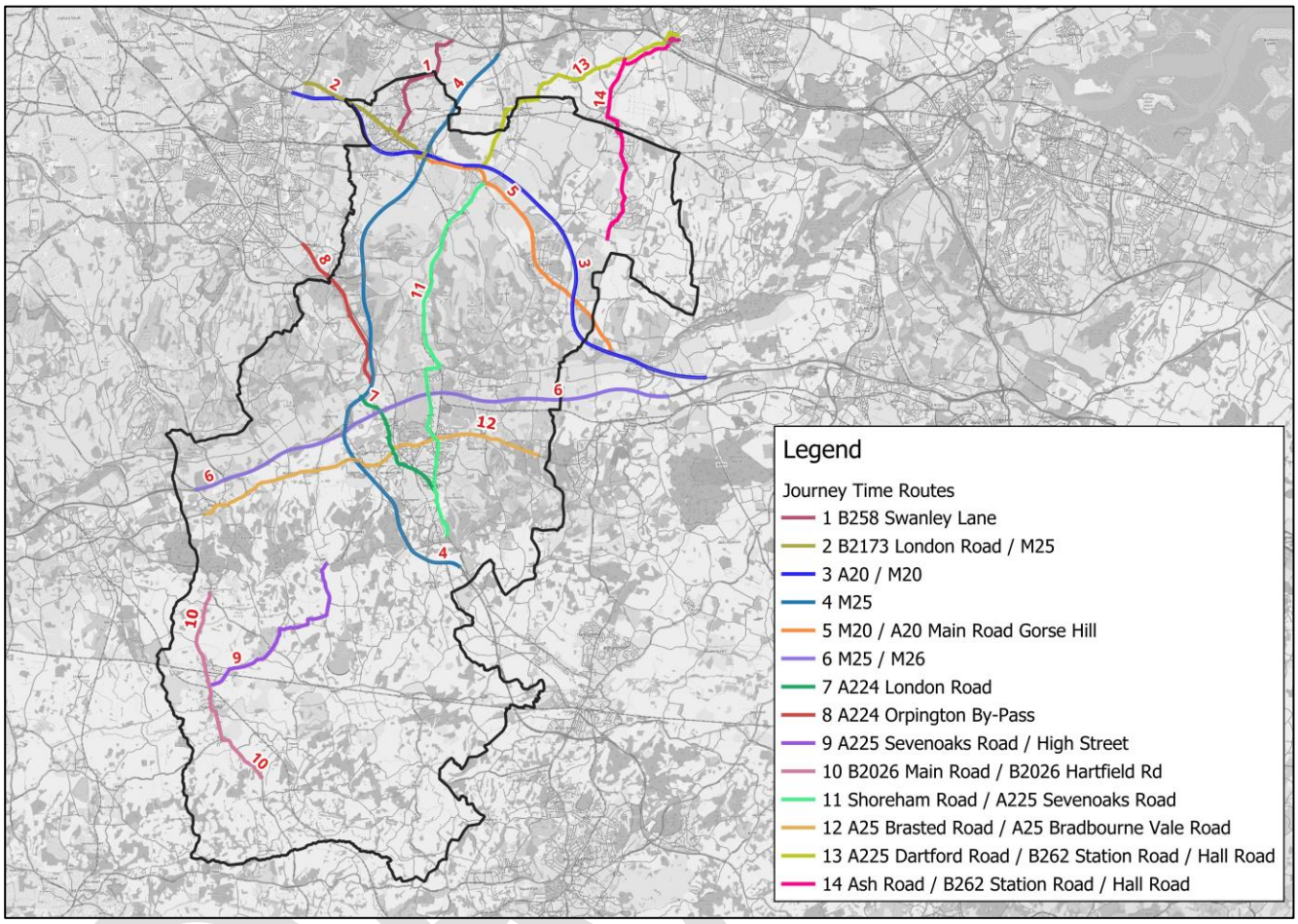

Figure 5-17: Updated Journey Time Routes in Sevenoaks

The result of the travel time comparison shows that in the AM peak, the following routes exhibit travel time increase of greater than 10% between the 2042 Forecast Baseline and 2019 Base.

- Route 2 along B2173 London Road and M25 westbound direction shows an increase of 16% or an additional 2 minutes 27 seconds in the journey time.
- Route 4 along M25 shows an increase of 12% or an increase of approximately 2 minutes in the journey time in the southbound direction.
- Route 7 along A224 London Road shows an increase of 11% or an increase of approximately 1 minute in the journey time in the southbound direction.
- Route 13 travelling from A225 Dartford Road to Hall Road shows and increase of 15% or more than 2 minutes in the northbound direction.
- Route 14 travelling from Ash Road to Hall Road shows an increase of 14% or more than 2 minutes of increase in the northbound direction.

Similar patterns are observed in the PM peak, with the addition of Route 12 along A25 Brasted Road / A25 Bradbourne Vale Road, which shows an increase in journey time of 11%, or more than 2 minutes, in the eastbound direction.

Although the report highlights the routes with a journey time difference of greater that 10%, it should be noted that a low percentage increase can still have impacts in the junction delays, especially on areas where congestion currently exists.

For example, in the AM peak, the following routes shows journey time increase of less than 10%, however, the actual time difference is close to 1 minute.

- Route 3 along A20 and M20 (westbound)
- Route 5 along M20 and A20 Main Road Gorse Hill (southbound)

Similarly, in the PM peak, the following routes shows actual time difference close to 1 minute:

- Route 5 along M20 and A20 Main Road Gorse Hill (northbound and southbound)
- Route 6 along the M25-M26 (eastbound)
- Route 11 along Shoreham Road and A225 Sevenoaks Road (northbound)
- Route 13 along A225 Dartford Road, B262 Station Road and Hall Road (northbound)
- Route 14 along Ash Road and Hall Road (northbound)

Route	Description	Direction	AM Peak			
			2019 Base Model [min:sec]	2042 Forecast Baseline [min:sec]	Actual Difference [min:sec]	% Difference
			AM	AM	AM	AM
1	B258 Swanley Lane	13_SB	07:03	07:06	00:03	1%
	B258 Swanley Lane	13_NB	07:03	07:11	00:08	2%
2	B2173 London Road / M25	14_EB	12:14	13:05	00:51	7%
	B2173 London Road / M25	14_WB	14:51	17:18	02:27	16%
3	A20-M20	15_EB	12:04	12:18	00:14	2%
	A20-M20	15_WB	12:12	13:15	01:03	9%
4	M25	16_SB	14:43	16:32	01:49	12%
	M25	16_NB	13:46	14:23	00:37	4%
5	M20 / A20 Main Road Gorse Hill	17_SB	15:25	16:49	01:24	9%
	M20 / A20 Main Road Gorse Hill	17_NB	16:20	17:29	01:09	7%
6	M25-M26	19_EB	10:35	10:52	00:17	3%
	M25-M26	19_WB	11:12	11:54	00:42	6%
7	A224 London Road	22_SB	08:32	09:26	00:54	11%
	A224 London Road	22_NB	08:13	08:19	00:06	1%
8	A224 Orpington By-Pass	24_NB	06:16	06:44	00:28	7%
	A224 Orpington By-Pass	24_SB	06:13	06:35	00:22	6%
9	A225 Sevenoaks Road / High Street	25_SB	08:49	08:53	00:04	1%
	A225 Sevenoaks Road / High Street	25_NB	08:49	08:55	00:06	1%
10	A224 Orpington By-Pass	26_NB	10:06	10:23	00:17	3%
	A224 Orpington By-Pass	26_SB	09:50	10:13	00:23	4%
11	Shoreham Road / A225 Sevenoaks Road	31_SB	22:52	22:33	00:19	-1%
	Shoreham Road / A225 Sevenoaks Road	31_NB	21:24	20:52	00:32	-2%
12	A25 Brasted Road / A25 Bradbourne Vale Road	32_EB	22:45	23:22	00:37	3%
	A25 Brasted Road / A25 Bradbourne Vale Road	32_WB	25:36	26:22	00:46	3%
13	A225 Dartford Road / B262 Station Road / Hall Road	33_SB	18:25	18:29	00:04	0%
	A225 Dartford Road / B262 Station Road / Hall Road	33_NB	15:29	17:46	02:17	15%
14	Ash Road / B262 Station Road / Hall Road	34_SB	18:40	19:00	00:20	2%
	Ash Road / B262 Station Road / Hall Road	34_NB	16:57	19:18	02:21	14%

Table 5-2: Modelled Journey Time Comparison – AM Peak

Route	Description	Direction	PM Peak			
			2019 Base Model [min:sec]	2042 Forecast Baseline [min:sec]	Actual Difference [min:sec]	% Difference
			PM	PM	PM	PM
1	B258 Swanley Lane	1_SB	07:03	07:10	00:07	2%
	B258 Swanley Lane	1_NB	07:03	07:06	00:03	1%
2	B2173 London Road / M25	2_EB	12:43	13:50	01:07	9%
	B2173 London Road / M25	2_WB	13:59	15:57	01:58	14%
3	A20-M20	3_EB	12:50	13:38	00:48	6%
	A20-M20	3_WB	11:02	11:19	00:17	3%
4	M25	4_SB	14:16	15:03	00:47	5%
	M25	4_NB	14:01	15:20	01:19	9%
5	M20 / A20 Main Road Gorse Hill	5_SB	15:33	16:23	00:50	5%
	M20 / A20 Main Road Gorse Hill	5_NB	15:19	16:04	00:45	5%
6	M25-M26	6_SB	11:07	11:59	00:52	8%
	M25-M26	6_NB	10:51	11:14	00:23	4%
7	A224 London Road	7_EB	08:12	11:15	03:03	37%
	A224 London Road	7_WB	08:50	10:20	01:30	17%
8	A224 Orpington By-Pass	8_EB	06:24	06:38	00:14	4%
	A224 Orpington By-Pass	8_WB	06:15	06:43	00:28	7%
9	A225 Sevenoaks Road / High Street	9_EB	08:42	08:47	00:05	1%
	A225 Sevenoaks Road / High Street	9_WB	08:41	08:52	00:11	2%
10	A224 Orpington By-Pass	10_SB	09:44	10:03	00:19	3%
	A224 Orpington By-Pass	10_NB	10:13	10:37	00:24	4%
11	Shoreham Road / A225 Sevenoaks Road	11_SB	21:48	21:46	00:02	0%
	Shoreham Road / A225 Sevenoaks Road	11_NB	21:54	22:20	00:26	2%
12	A25 Brasted Road / A25 Bradbourne Vale Road	12_NB	23:48	26:19	02:31	11%
	A25 Brasted Road / A25 Bradbourne Vale Road	12_SB	22:53	23:43	00:50	4%
13	A225 Dartford Road / B262 Station Road / Hall Road	13_SB	14:17	14:44	00:27	3%
	A225 Dartford Road / B262 Station Road / Hall Road	13_NB	15:32	16:33	01:01	7%
14	Ash Road / B262 Station Road / Hall Road	14_NB	15:33	16:03	00:30	3%
	Ash Road / B262 Station Road / Hall Road	14_SB	15:33	16:24	00:51	5%

Table 5-3: Modelled Journey Time Comparison – PM Peak

6. Summary and Recommendations

This Report describes the methodology used to develop the 2042 Forecast Baseline and approach taken to identify the key junction and link "hots spots" in Sevenoaks district.

Overall, the 2019 AM and PM outputs present similar locations of junction and link "hot spots". The majority of the junctions exhibiting LOS E and F, or links displaying unstable flows (>85%) or which are over capacity (>100%), are located along key junctions and corridors of Swanley, Halstead, Sevenoaks Town, Otford and Edenbridge. This shows that the current network in the town centre is already experiencing delays and reduced capacity.

The committed developments and highway schemes were identified in collaboration with KCC and SDC and were implemented in the 2042 Forecast Baseline together with the growth in the neighbouring authorities and other external areas.

The 2042 Forecast Baseline shows increase in traffic flows in major corridors, particularly around M25, M20, M26 and A21. Increases in traffic flows are also predicted along A224 London Road, Shoreham Road, A224 Orpington By-Pass, A225 Dartford Road, A225 Sevenoaks Road, A25 Westerham Road, A25 Bradbourne Vale Road, A25 Seal Road and in local roads around the town centre in Swanley, Sevenoaks and Edenbridge.

The introduction of the Lower Thames Crossing leads to an overall decrease in traffic on the M20 while simultaneously increasing congestion on A229 and the M2. Additionally, a reduction in traffic is anticipated along the A2, as vehicles are expected to reroute from using the Dartford Crossing to LTC.

In terms of junction and link "hot spots" in 2042, the majority of those locations identified in 2019 are still problematic in 2042. However, due to the overall growth assumed, additional junctions and links showing LOS E and F or V/C ratio >85% were identified:

Area		Road /Junction	2019 Base	2042 Forecast Baseline
Swanley, Eynsford, New Ash Green and Halstead	V/C >85%	Bartholomew Way	>85%	>100%
		High Street	>85%	>100%
		M25 between J3 and J4 Southbound	-	>85%
		A20 Main Road	-	>85%
	LOS E or F	High Street/St Georges Road	E	E
		M25 J3	F	E
		Hewitts Roundabout	F	F
Sevenoaks Town, and Otford	LOS E or F	A25 / Bradbourne Road	E	F
		Seal Road/Filmer Lane/ Seal Hollow Road	E	F
		Westerham Road/Larkfield Road	E	F
		A25 / Otford Road / St Johns Hill	F	A
		High Street/Pembroke Road	F	F
		Westerham Road/ A21 Onslip SB	F	F
		Station Road / Shoreham Road / Pilgrims Way E	E	E
		Westerham Road / Cold Arbor Road	-	E
		Worship Road / Witches Lane	-	E
		A25 London Road / Maidstone Road	-	E
		Morleys Roundabout	-	E
Edenbridge	LOS E or F	Mont St Aignan Way/Lingfield Road	F	F
		Mont St Aignan Way/Stangrove Road	F	F
		B2026 Station Road/High Street	E	E

Table 6-1: 2042 List of Junction and Link "Hot Spots"

The following journey time routes show more than 10% travel time increases. Most of these routes cover the hot-spots areas mentioned above.

- Route 2 – B2173 London Road / M25
- Route 4 - M25
- Route 7 – A224 London Road
- Route 12 - A25 Brasted Road / A25 Bradbourne Vale Road
- Route 13 – A225 Dartford Road / B262 Station Road / Hall Road
- Route 14 – Ash Road / B262 Station Road / Hall Road

This 2042 forecast baseline scenario has been designed to assess the impacts of committed developments and overall growth in the neighbouring districts surrounding Sevenoaks District. This scenario will also be used as a reference for comparison for the "with local plan" scenario. It is important to recognize that in strategic modelling, issues at one junction may indicate delays or congestion in nearby corridors. The outputs from the strategic model provide a high-level overview of where road capacity might become a concern. Developing local junction models to incorporate accurate geometry and visibility data for specific locations will be undertaken as the next stage to verify these issues.

As mentioned in the earlier section, this report has been submitted as a draft and is subject to review by Kent County Council and National Highways. Revisions may be expected in the final version, depending on feedback received from both parties.

Appendix A. List of Committed Developments in Sevenoaks