Essex Highways

Braintree Local Plan Review

Regulation 18: Highway Impact Appraisal of Preferred Spatial Option

Technical Report

January 2026

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Braintree Local Plan Review – Reg 18 Evidence Report 2

Regulation 18 Highway Impact Appraisal: Technical Report

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Document prepared by:

Essex Highways	Transport Planning Regent House Chelmsford CM1 1QU	**W**	www.essex.gov.uk/highways

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Acronyms and abbreviations

BDC	Braintree District Council
NEMo	North Essex Model
NPPF	National Planning Policy Framework
TCBGC	Tendring Colchester Borders Garden Community
TRICS	Trip Rate Information Computer System
VDM	Variable Demand Model

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1. Introduction

1.1 Background & Context

Braintree District Council (BDC) are currently undertaking a review of their Local Plan adopted in July 2022. Essex Highways have been commissioned to provide consultancy support through the Local Plan review process, with a specific remit to support development of the transport evidence base. This technical report and accompanying appendices serve as the second in a series of deliverables to be provided by Essex Highways and covers the following material to be published for Regulation 18 consultation in February 2026:

1)   Highway impact modelling of a Local Plan Preferred Spatial Option

2)   Highway impact modelling of a mode-shift sensitivity test

The highway impact modelling documented in this report follows a sustainable accessibility appraisal and baseline review undertaken in autumn/winter 2025 and documented in the following evidence base report produced by Essex Highways: "Braintree Local Plan Review: Sustainable Accessibility and Baseline Appraisal, January 2026".

The purpose of this study is to support the selection of a Preferred Spatial Option to take to consultation by assessing the impact of development proposals on traffic flows and journey patterns across the future road network in Braintree District.

1.2 Exceptions

Confirmation of development to be allocated as part of BDC's initial Preferred Spatial Option was received in November 2025. Owing to timescale constraints, a limited assessment of highway impact has been undertaken in November/December 2025 for Regulation 18 consultation. The following elements have necessarily been excluded from the initial appraisal, and will be undertaken in winter/spring 2026 to assist with technical responses to representations made by the public and key stakeholders at consultation:

1)   Highway impact modelling of 2x alternative spatial options – including larger development sites not allocated in the Preferred Spatial Option

2)   Highway impact modelling of the Preferred Spatial Option with the inclusion of initial mitigation proposals

3)   Highway impact modelling of cross-boundary impact of spatial options

Findings from these additional scenario tests will be documented in an addendum modelling report to be issued in Spring 2026.

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2. North Essex Model

2.1 Model Development

The North Essex Model (NEMo) is a strategic highway and public transport model with a base year of 2023. It is being used to assess the impact of local plans across north Essex. Forecast year assessments involve changing the network in the base model along with trip demand to reflect scenarios to be tested.

The NEMo base year model has been developed by expanding and updating the Colchester Transport Model (CTM), which has a base year of 2019. The detailed area of modelling in the CTM was expanded to include parts of Braintree and Tendring to align with options being considered in their local plan reviews. Updates were made to the highway and public transport networks to reflect 2023 conditions; and car, LGV, HGV, bus and rail demand was adjusted to reflect better 2023 travel patterns. The resulting NEMo was then validated against 2023 flow and journey time data to confirm it is a reasonable representation. A network map of NEMo in the Braintree district and surrounding area is shown in Figure 2-1.
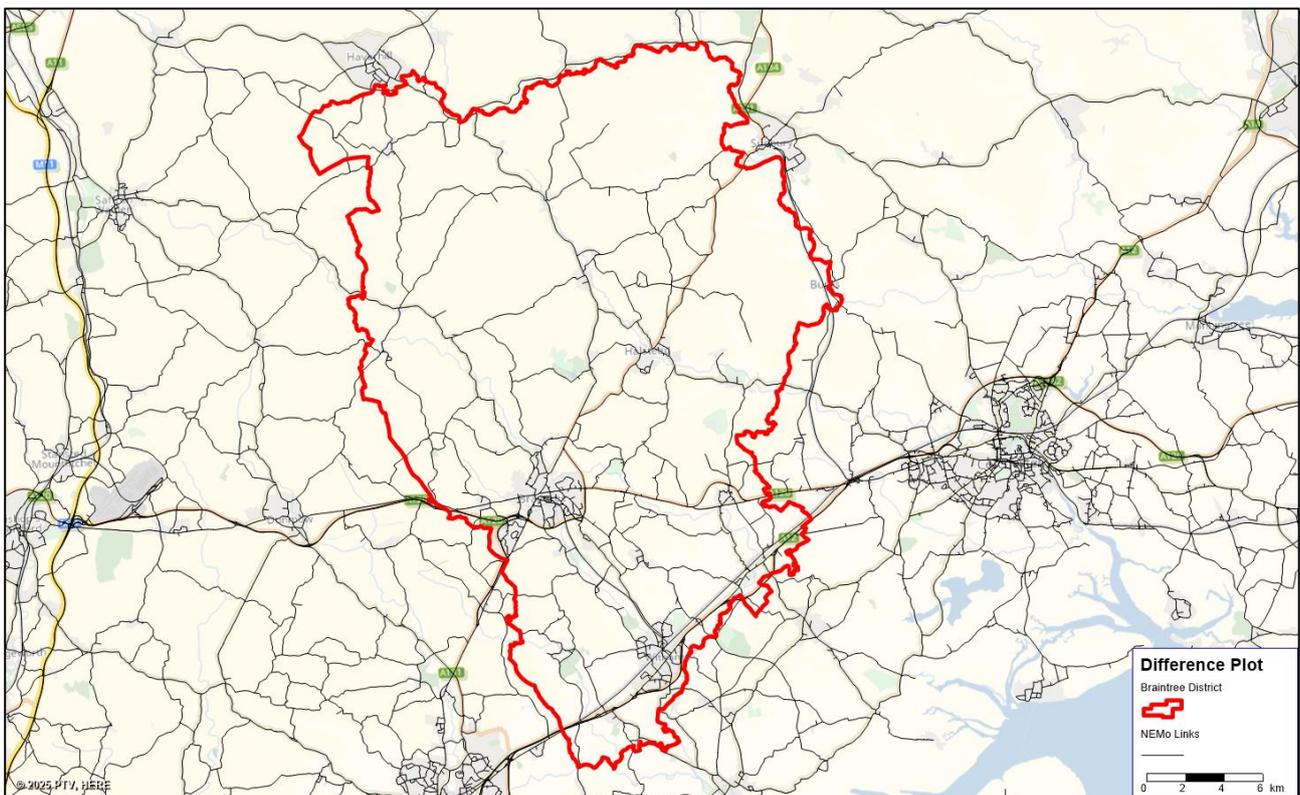
Figure 2-1: NEMo Network Map in Braintree Area

CTM, and hence NEMo, has been built following Department for Transport (DfT) Transport Analysis Guidance (TAG) guidance and best modelling practice, and the update process has followed DfT guidance on present day updates, in which models are refreshed rather than reconstructed entirely.

NEMo includes a variable demand model (VDM), also developed in line with DfT guidance, which allows trip makers to change destination and switch between car and public transport modes. The VDM considers trip purposes over a 24-hour period and predicts from where trips will be produced, to where they will be attracted and which mode will be used. It then produces origin and destination car, bus and rail matrices for the AM and PM peak hours and average interpeak hours.
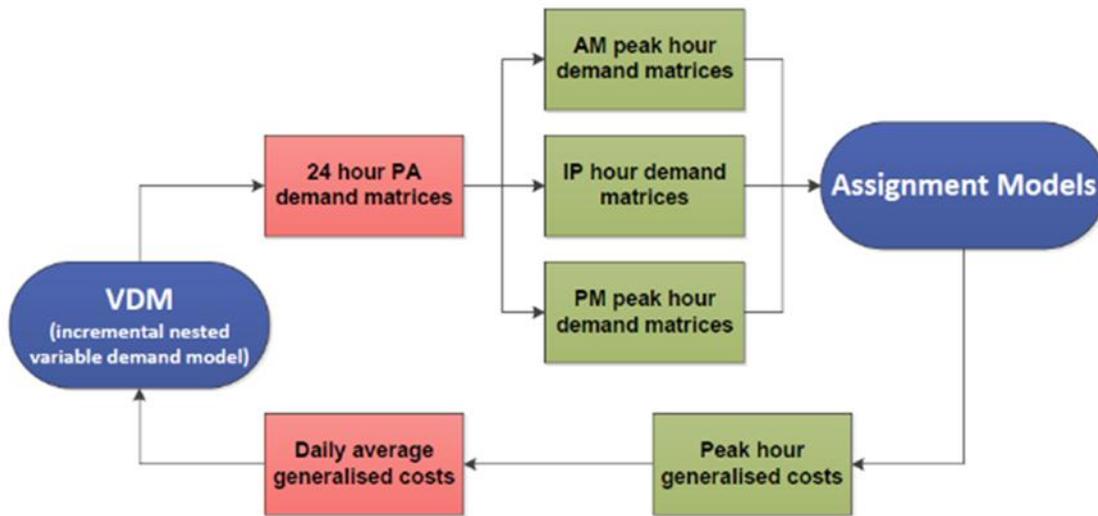
Figure 2-2: Relationship between demand and assignment models

The trips in the car matrix are subdivided into commuting, business and other trips and assigned onto the highway network alongside estimates of LGVs and HGVs using VISUM software. Buses, which travel on the highway network, are also included but follow designated routes. Meanwhile the bus and rail trips are assigned onto the public transport network using EMME software. Some public transport trips use both bus and rail to complete a journey.

The VDM and assignment models iterate with each other until they reach convergence – which means that a iteration of the model would not result in further changes in destination or mode choice. For information, the highway assignment model forecasts route choice and delay as more trips are added to the network. The public transport assignment model allows buses to fall behind scheduled timetables as result of congestion on the highway network, but rail services are assumed always to run to schedule.

NEMo represents a typical midweek-day in a month without major holidays; hence is skewed towards days with heavier traffic flow. Choosing such conditions tends to maximise normal traffic flow through all parts of the transport network and follows modelling best practice[1]. The highway assignment model shows traffic conditions in the AM peak hour 07.30-08.30 and the PM peak hour 16.30-17.30, since these are, overall, the busiest hours in 2023 across North Essex in the respective peaks. The highway model can also show traffic conditions for an average interpeak hour between 10.00-16.00. The public transport model shows public transport trips for average peak hours in the AM (07.00-10.00), interpeak (10.00-16.00) and PM (16.00-19.00) periods.

The North Essex Model – 2023 Validation Technical Note, dated April 2025, details the changes and updates to NEMo and presents the updated validation information for the present-day base year model. This work has been reviewed by NH's sub-consultants, AECOM, with all comments closed.

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[1] https://content.tfl.gov.uk/traffic-modelling-guidelines.pdf

2.1.1 Model Limitations

NEMo, which encompasses a large geographic area at different levels of detail, is considered suitable to test a range of strategic and specific interventions in relation to Local Plan spatial options. However, it is acknowledged that whilst NEMo is fit for testing the Local Plan spatial options, as specific developments and mitigation measures come forward, it may be appropriate to complement NEMo by local junction and microsimulation models to provide a higher level of assurance.

2.2 Summary of model scenarios

In order to set a baseline against which the impact of BDC's Preferred Spatial Option development allocations can be assessed, a Reference Case model for 2041 has been developed which represents the growth without the Preferred Spatial Option. Following on from the development of the Reference Case models, an Assessment Case model has been developed, which is based on the Reference Case model but also includes the trip demand associated with the Preferred Spatial Option. Finally, a sensitivity test has been prepared, which includes a reduced travel demand which could be achieved through the provision of sustainable measures.

This document outlines the key assumptions underpinning the growth and transport schemes included in the various scenarios and explains how these assumptions have been applied within the transport model. It also presents a comparative analysis of model outputs:

- between the pre- and post- variable demand model (VDM) Reference Case outputs;

- between the post-VDM Reference Case and Base Year model outputs;

- between the Assessment Case and post-VDM Reference Case model outputs; and

- between the Sensitivity Test and Assessment Case model outputs.

3.   Reference Case

3.1   Introduction

This chapter describes the approach to developing the Reference Case models. It includes details on the demand and network assumptions, and also the application of the Variable Demand Model (VDM).

3.2   Forecast Demand

3.2.1   Household and job assumptions

Without Braintree's Preferred Spatial Option allocations, some level of growth would reasonably be expected to occur in the district and surrounding areas. This growth has been called reference case growth. In Braintree District, Reference Case growth to 2041 has been assumed to include housing sites that have been identified by BDC as "Near Certain" and "More Than Likely" to come forward (see Appendix A). Information on planned employment developments was not fully confirmed at the time the modelling was undertaken, so NTEM8 forecasts up until 2041 have been used.

Since Braintree District will be particularly affected by growth in the North Essex authorities of Colchester and Tendring, planned development in these locations has also been identified.

Information on planned housing developments was available from Colchester Borough Council. "Near Certain" and "More Than Likely" housing development has been included in the Reference Case Model, as well as the emerging Local Plan allocations up to 2041. Since information on planned employment developments was not available at the time the modelling was being undertaken, NTEM8 forecasts up until 2033 have been used, as well as the emerging Local Plan allocations up to 2041. Since supporting mitigation measures for Colchester have been included in the Reference Case network (see Section 2.3), associated sustainable travel reductions have been applied in the Colchester area.

In Tendring, information on planned housing and employment developments was available from Tendring District Council, and "Near Certain" and "More Than Likely" developments have been included up until 2042.

Housing and employment growth at Tendring and Colchester Garden Community (TCBGC) has also been included up to 2041. It is worth noting that TCBGC growth has been informed by latest developer assumptions, in which employment to 2041 is concentrated in the Colchester model zones and housing in the Tending model zones.

Growth in districts beyond North Essex is assumed to be at 2041 levels predicted by NTEM.

The Reference Case growth in each district is shown in Table 3-1 below. It should be noted that these numbers do not include the TCBGC growth. The TCBGC growth has been informed by latest developer assumptions, and trip ends have been added directly on top on the final demand.

Table 3-1: Increase in Dwellings and Jobs, 2041 compared to 2023

Council Area	2023 base	2041 Reference Case Growth	2023 base	2041 Reference Case Growth
	Households		Jobs	
Braintree	65,039	11,308 (+17%)	66,221	3,355 (+5%)
Tendring	66,906	8,213 (+12%)	51,341	1,336 (+3%)
Colchester	81,086	17,153 (+21%)	97,188	15,285 (+16%)

The full list of developments is presented in Appendix A.

3.2.2 Trip generation

Having established the growth in households and employment, the alternative planning assumptions module in TEMPro was used to provide an estimate of trip growth at the Middle Super Output Layer (MSOA) level. The alternative planning assumptions are shown in the table below.

Table 3-2: TEMPro Alternative Planning Assumptions for Braintree, 2041

MSOA	TEMPro Base (2023)		Uncertainty Log Growth (2023-2041)		TEMPro Forecast (2041)	
	Households	**Jobs**	**Households**	**Jobs**	**Households**	**Jobs**
Braintree 001	2,929	2,289	91	N/A	3,020	2,396
Braintree 002	2,666	2,080	62	N/A	2,728	2,178
Braintree 003	2,855	2,371	297	N/A	3,152	2,498
Braintree 004	4,093	3,195	520	N/A	4,613	3,372
Braintree 005	2,718	3,116	130	N/A	2,848	3,279
Braintree 006	3,738	4,299	149	N/A	3,887	4,490
Braintree 007	3,751	2,860	2,288	N/A	6,039	3,023
Braintree 008	3,168	4,925	1,145	N/A	4,313	5,143
Braintree 009	4,510	7,170	89	N/A	4,599	7,564
Braintree 010	3,068	2,856	4	N/A	3,072	2,996
Braintree 011	4,065	3,962	89	N/A	4,154	4,182
Braintree 012	4,305	3,207	1,045	N/A	5,350	3,383
Braintree 013	3,767	2,646	1,792	N/A	5,559	2,791
Braintree 014	4,609	4,351	1,739	N/A	6,348	4,569
Braintree 015	3,952	2,257	785	N/A	4,737	2,384
Braintree 016	2,406	816	63	N/A	2,469	863
Braintree 017	4,976	11,064	438	N/A	5,414	11,570
Braintree 018	3,464	2,759	581	N/A	4,045	2,895
Total	**65,039**	**66,221**	**11,308**	**N/A**	**76,347**	**69,576**

Growth in trips is output in the production/ attraction format over 24 hours, which is required by the VDM.

Often the Trip Rate Information Computer System (TRICS) database is used to provide historic trip rates from similar developments. However, since the NTEM core scenario reflects trends in car ownership and trip rates for each MSOA it was considered better to use for a strategic level assessment as it represents a 'Business as Usual' (BaU) approach. It also suited the information that was provided, which for employment sometimes included jobs information but not land area.

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Since TEMPro provides trip growth assumptions at the MSOA level, refinements were made to allocate a greater share of growth to the specific model zones within each MSOA where developments are actually located.

- For MSOAs in Braintree District that include developments, the following steps were undertaken:

  o **Step 1: Baseline Growth Without Development Assumptions** A TEMPro growth factor was applied to the base year trip ends, assuming no growth in dwellings or employment. This was achieved by modifying the default 2041 household and job figures in TEMPro to match the 2023 values. This adjustment isolates the background growth captured by TEMPro, excluding any development-related growth.

  o **Step 2: Incorporating Committed Developments** Alternative planning assumptions were then applied to the default 2041 household and job figures in TEMPro to reflect the committed developments included in the Reference Case. The adjusted 2041 figures were extracted, and the development-related trip ends were calculated as the difference between this output and the trip ends extracted from TEMPro from Step 1. These development trip ends were then added to the adjusted trip ends from Step 1 (i.e. base year trip ends multiplied with the adjusted growth factor from Strep 1).

  o **Step 3: Spatial Allocation Within MSOAs** Where an MSOA spans multiple model zones (e.g. zones 1, 2, and 3), but development is known to occur only in a specific zone (e.g. zone 1), all development-related growth was allocated to that zone. No growth was assigned to the other zones within the same MSOA.

  o **Step 4: Additional Growth at TCBGC Zones** Additional trip growth was incorporated for the TCBGC zones based on emerging data from the developer's Masterplan.

- For all other areas of the model, default TEMPro growth factor (2023-2041) to base year demand have been applied for all model zones in MSOAs without developments

3.2.3 Trip distribution

Since the Reference Case is run with the Variable Demand Model (VDM), the distribution of trip growth is managed directly through the VDM process. This approach ensures that changes in travel demand are not applied uniformly across the network but are instead allocated in a way that reflects realistic behavioural responses to congestion, journey times, and network conditions. By doing so, the VDM accounts for how travellers may alter their route choices, destinations, or even mode of transport in response to evolving circumstances. As a result, the model provides a more robust and representative picture of how trip growth is likely to manifest within the network, improving the credibility of the assessment and ensuring that the impacts of development are captured in a manner consistent with observed travel behaviour.

3.3 Forecast Network

As well as identifying growth in trips ends, the Reference Case model reflects changes in the highway network – that is, highway schemes that are reasonably expected to come forward because funding and decisions are in place.

The schemes included in the Reference Case network are listed in Table 3-3 overleaf.

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Table 3-3: Committed Schemes (Fully Modelled Area) included in the Reference Case

Council Area	Scheme Name	Scheme Description
Braintree	Panfield Lane/ Springwood Drive Link Road	New link road connecting Panfield Lane and Springwood Drive, with a new roundabout on Panfield Lane
Braintree	Springwood Drive roundabout	Improvements to Springwood Drive/ Rayne Road roundabout
Braintree	Marks Farm Roundabout	Widened approaches to northern, eastern and southern arms of Marks Farm Roundabout
Colchester	A12 J29	Widened slip road and full signalization
Colchester	A12 J25	Widened approaches to Station Rd Roundabout and full signalization
Colchester	A12 J27	Full signalization
Colchester	Greenstead Roundabout	Reconfigured roundabout and full signalization
Colchester	Traffic signal upgrades	Platooning alterations on signalized corridors to reflect investment in new dynamic traffic management technologies
Tendring	A120 scheme	New link road between A120 and Ramsey Rd to the west of Harwich
Chelmsford	North-East Bypass	New bypass connecting Beaulieu Parkway and Deres Bridge Roundabout

Since it is expected that TCBGC would promote or part fund solutions to mitigate its impact at A12 Junction 29 and Greenstead roundabout, improvement schemes for these junctions have been included in the Reference Case. Since details regarding the possible mitigation measures related to TCBGC are not yet known, assumptions have been made based on local knowledge and the best information available at the time.

Following the cancellation of the A12 J19-25 widening, this scheme has not been included in the Reference Case network.

To ensure that development-related trips are accurately represented within the transport model, additional zone connectors have been incorporated. These connectors provide appropriate access points, allowing trips to enter and exit the model network at locations that reflect realistic travel behaviour and network usage. By aligning the connectors with representative junctions and corridors, the modelling process captures the likely distribution of traffic flows more effectively, thereby improving the robustness of the assessment and ensuring that the impacts of the development are evaluated in a credible and transparent manner.

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3.4 Variable Demand Model

As shown in Figure 2-2, the Reference Case has been run through the VDM to produce a set of origin/ destination assignment matrices for the AM and PM peak hours and average inter-peak hour. The flow differences between the post-VDM and pre-VDM Reference Case models are shown in the below figures.

Figure 3-1 illustrates the flow differences between the post-VDM and pre-VDM Reference Case models during the AM peak. The red bandwidths indicate an increase in traffic in the post-VDM flow compared to the pre-VDM, whilst the green bandwidths indicate a decrease. The most significant increase in traffic is westbound along the A120 to the west of Braintree (up to approximately 310 vehicles per hour).

Figure 3-2 illustrates the flow differences between the post-VDM and pre-VDM Reference Case models during the PM peak. The most significant increase in traffic is westbound along the A120 to the west of Braintree (up to approximately 320 vehicles per hour).

In both time periods there are increases in traffic flow along both directions of the Panfield Lane/ Springwood Drive Link Road (approximately 35 vehicles per hour northbound and 70 vehicles per hour southbound), and general decreases in flow in Braintree town centre.

As shown in Table 3-4 below, the overall change in car demand as a result of running the VDM is very small (0.47% and 0.30% increase in AM and PM respectively). It should be noted that LGV and HGV demand remains fixed.

Table 3-4: Pre-VDM and Post-VDM Car Matrix Totals

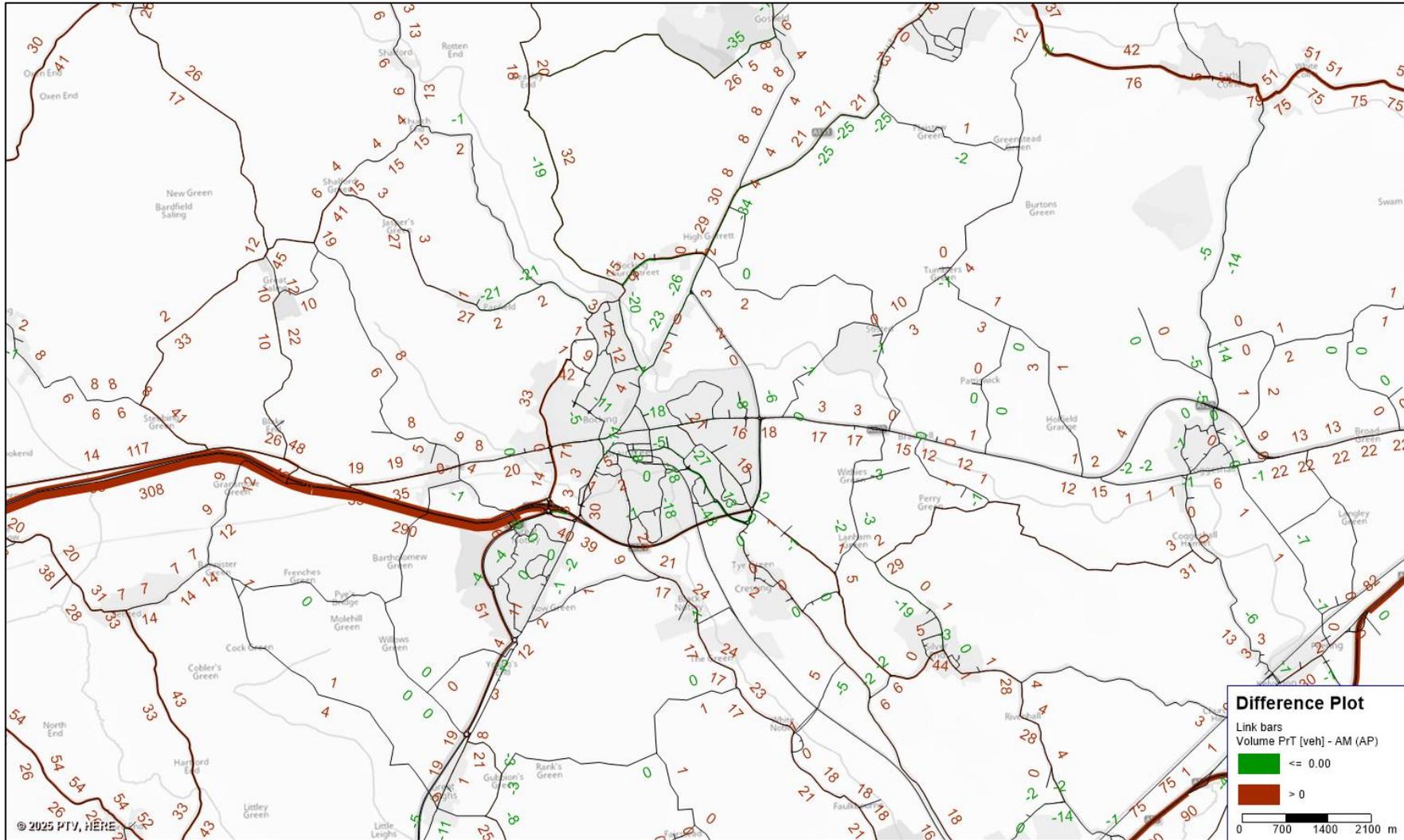|	AM Peak	PM Peak
Pre-VDM	396,354	440,956
Post-VDM	398,215 (+0.47%)	442,266 (+0.30%)

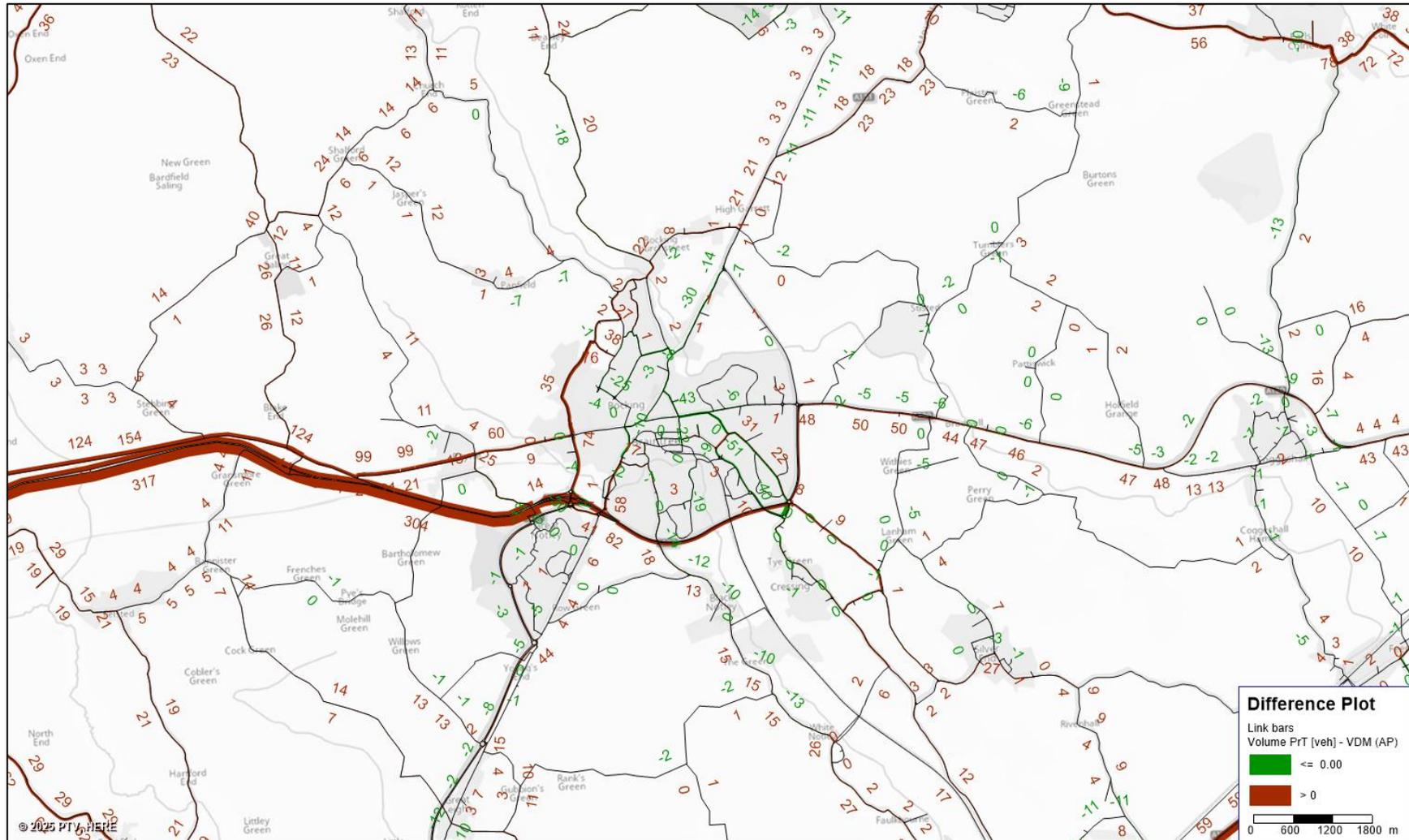**Figure 3-1: 2041 Post vs Pre Reference Case VDM – Flow Difference – AM**

Figure 3-2: 2041 Post vs Pre Reference Case VDM – Flow Difference – PM

4. Reference Case vs Base Year

4.1 Introduction

This chapter presents the Reference Case model outputs, including changes in flow (Section 3.2), speed (Section 3.3) and queues (Section 3.4) compared to the base year.

4.2 Flow Difference

Figure 4-1 and Figure 4-2 illustrate the flow differences between the post-VDM Reference Case and Base Year models during the AM and PM peak hours respectively. The values have been rounded to the nearest ten vehicles.

Both time periods exhibit broadly similar overall performance. In 2041, higher demand leads to substantial increases in traffic flow along the A120 west of Braintree, while flows decrease on the A120 eastbound due to heavier congestion at Galley's Corner roundabout and potential rerouting via the Panfield Lane/ Springwood Dive link road. The introduction of the link road in the Reference Case also reduces traffic on Rayne Road and Panfield Lane.

There are also increases in flow on the A12 in both directions, as well as on other strategic corridors including the A131 Halstead Road, A1017 Potter Street, A1124 Stonebridge Hill and the B1018.

There are decreases in flow on the A131 Braintree Road south of the new roundabout with the Chelmsford North-East Bypass, as traffic transfers from the A131 onto the bypass.

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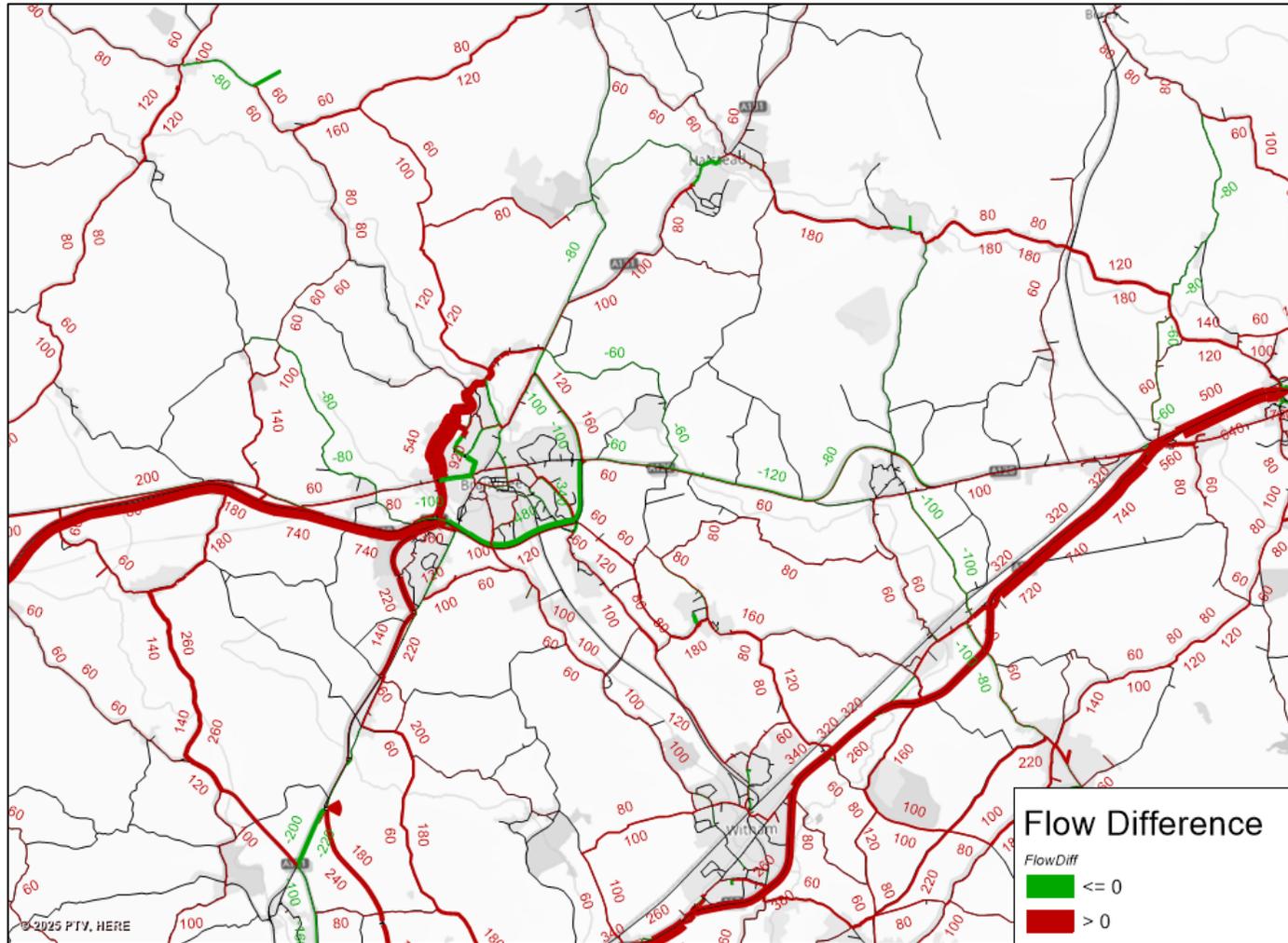
Figure 4-1: Reference Case (2041) vs Base Year (2023) - Flow difference – AM

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Figure 4-2: Reference Case (2041) vs Base Year (2023) - Flow difference – PM

4.3 Speed Ratio Changes

The speed ratio is a measure of modelled speed compared to the free-flow speed on a link, with lower speed ratios showing reduced speeds compared to free-flow conditions. Figure 4-3 and Figure 4-4 illustrate the speed ratio changes between the post-VDM Reference Case and Base Year models during the AM and PM peak hours respectively. The red links show a worsening of speed ratio and therefore an increase in congestion, whilst the green links show improvements in speed ratio and reduced congestion. The absolute speed ratio plots for the Reference Case scenario are shown in Appendix C (opposed to change between scenarios).

In the AM peak hour, the 2041 Reference Case shows reduced speeds approaching Galley's Corner roundabout from both the A120 West and Long Green Road. Whilst there are speed improvements on the A131 approach to Marks Farm roundabout, there are speed reductions on the A120 westbound approach. There are also speed reductions on the Halstead Road approach to High Garrett.

In the PM peak hour, the Reference Case shows reduced speeds compared to the base year along Pod's Brook Road, with delays extending onto the A120 off-slip road.

In both time periods there are speed reductions on the A131 Braintree Road where traffic slows down as it approaches the new roundabout with the Chelmsford North-East Bypass.

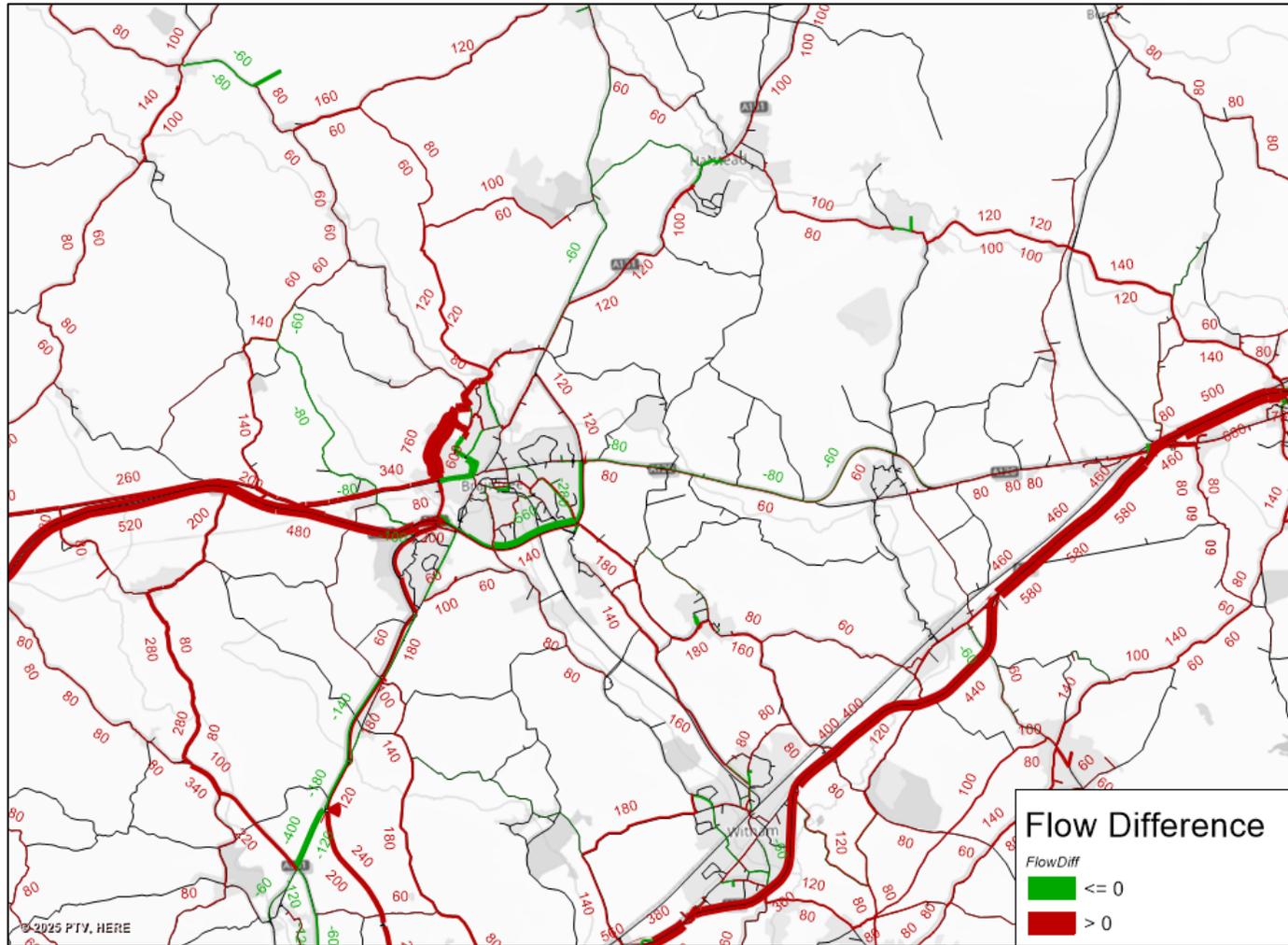**Figure 4-3: Reference Case (2041) vs Base Year (2023) – Speed Ratio changes – AM**
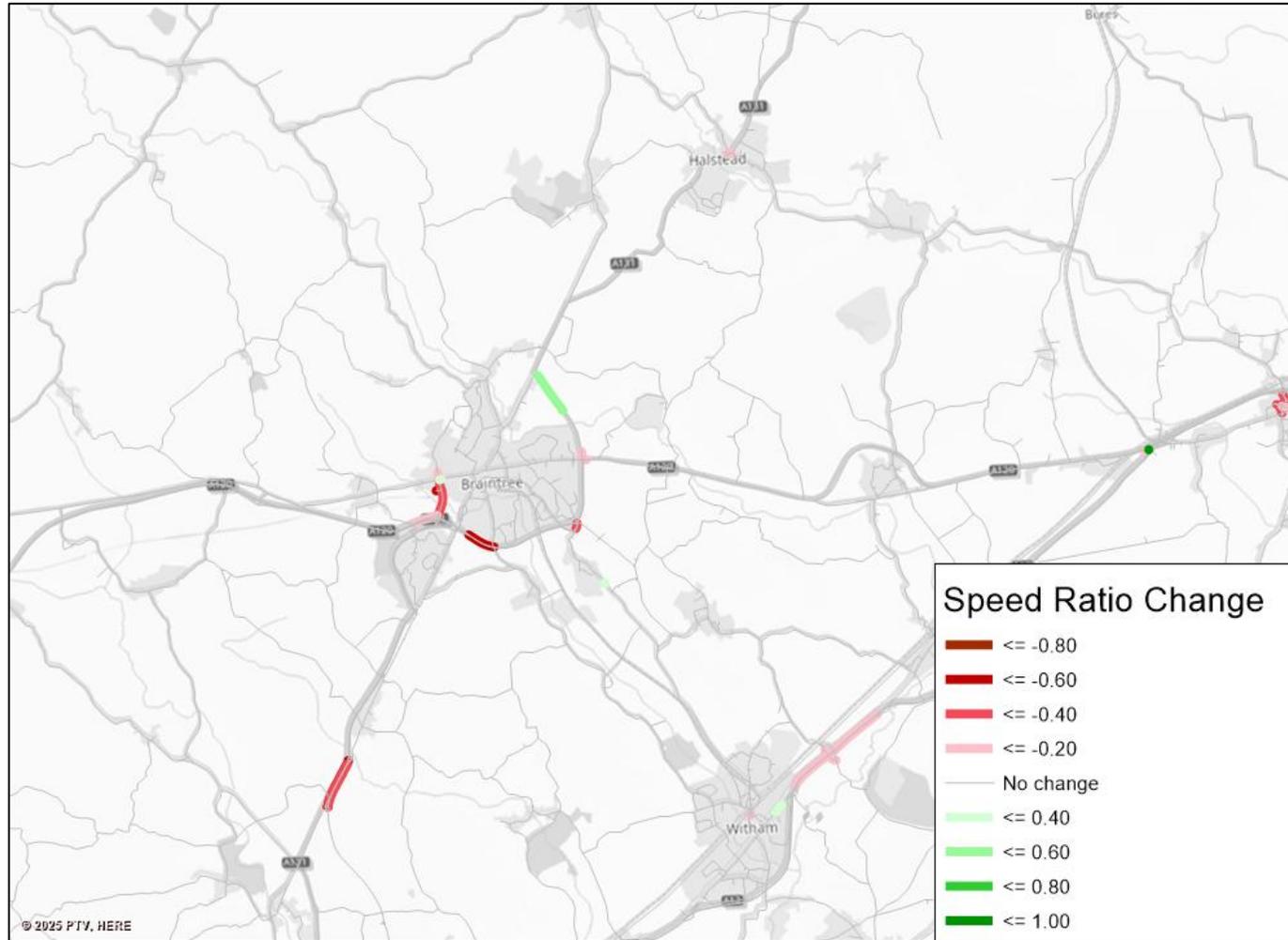
Figure 4-4: Reference Case (2041) vs Base Year (2023) – Speed Ratio changes – PM

4.4 Relative Queue Changes

The relative queue indicator shows blocking back of traffic on links – i.e. traffic that doesn't get through in the modelled time period which, therefore, causes queues to form. This indicator only appears on the worst performing parts of the modelled network. The absolute relative queue plots for the Reference Case scenario are shown in Appendix D (as opposed to change between scenarios).

Figure 4-5 and Figure 4-6 show the changes in relative queue between the Reference Case and Base year models during the AM peak and PM peak respectively.

In the AM peak hour, relative queueing increases at Galley's Corner roundabout on both the B1018 and Long Green Road approaches. Similar increases are observed on the A131 approach to Marks Farm roundabout and on the Halstead Road approach to High Garrett. There are queue reductions on Panfield Lane/ Aetheric Road as the new link road relieves congestion in this area.

In the PM peak hour, relative queue lengths rise along the A120 west of Galley's Corner roundabout, the A131 approach to Marks Farm roundabout, and Pod's Brook Road northbound.
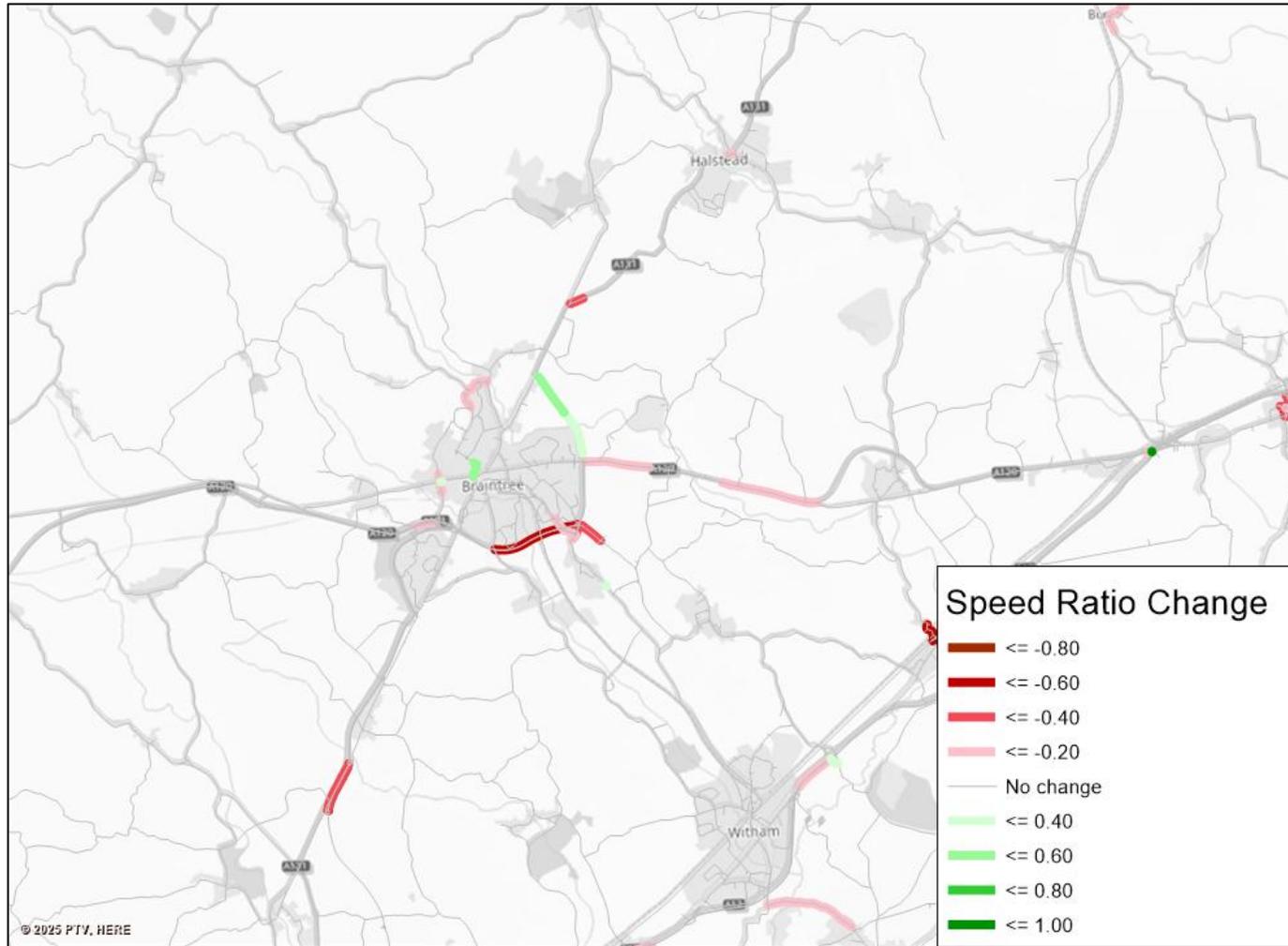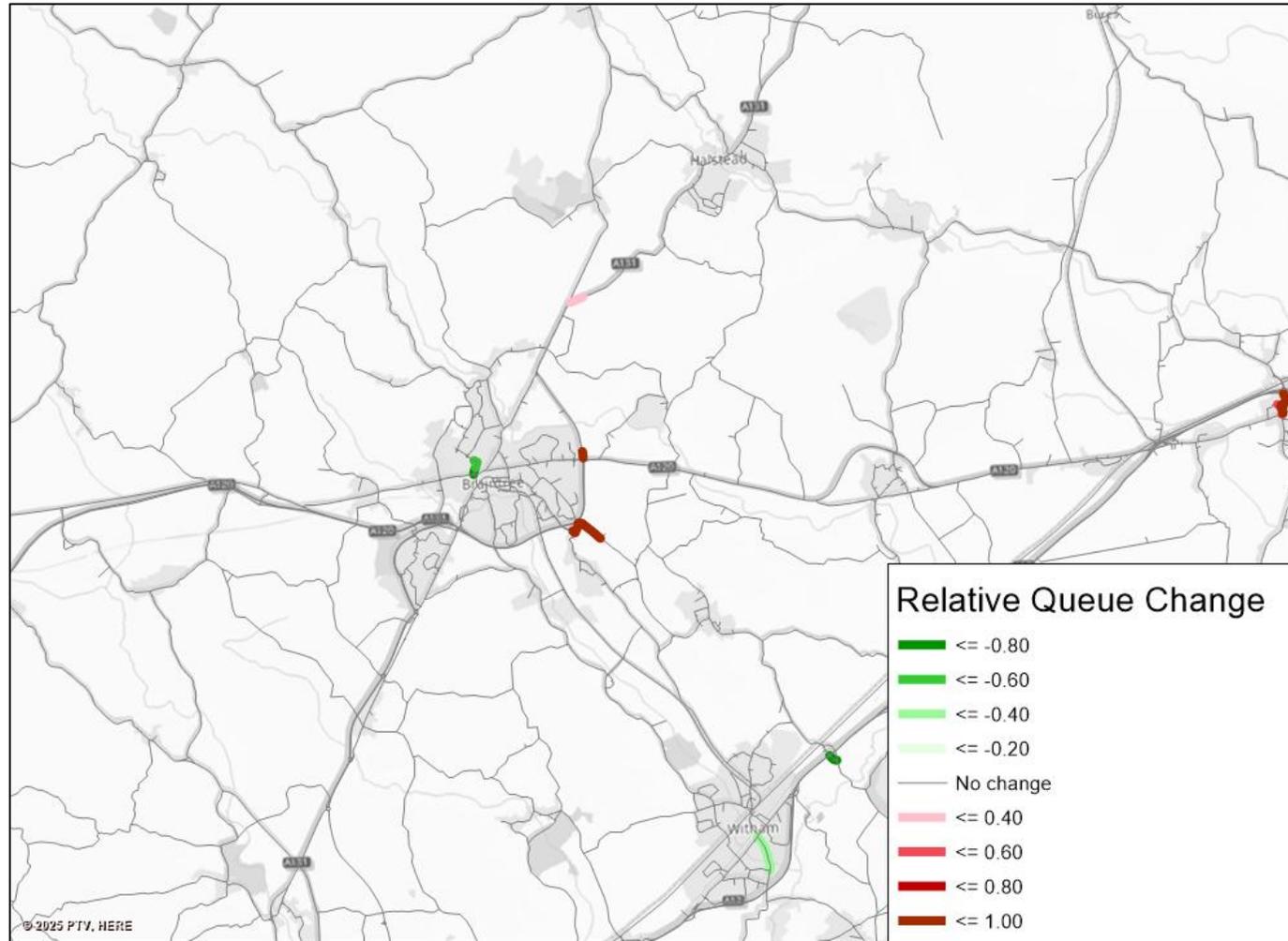
Figure 4-5: Reference Case (2041) vs Base Year (2023) – Relative Queue changes – AM
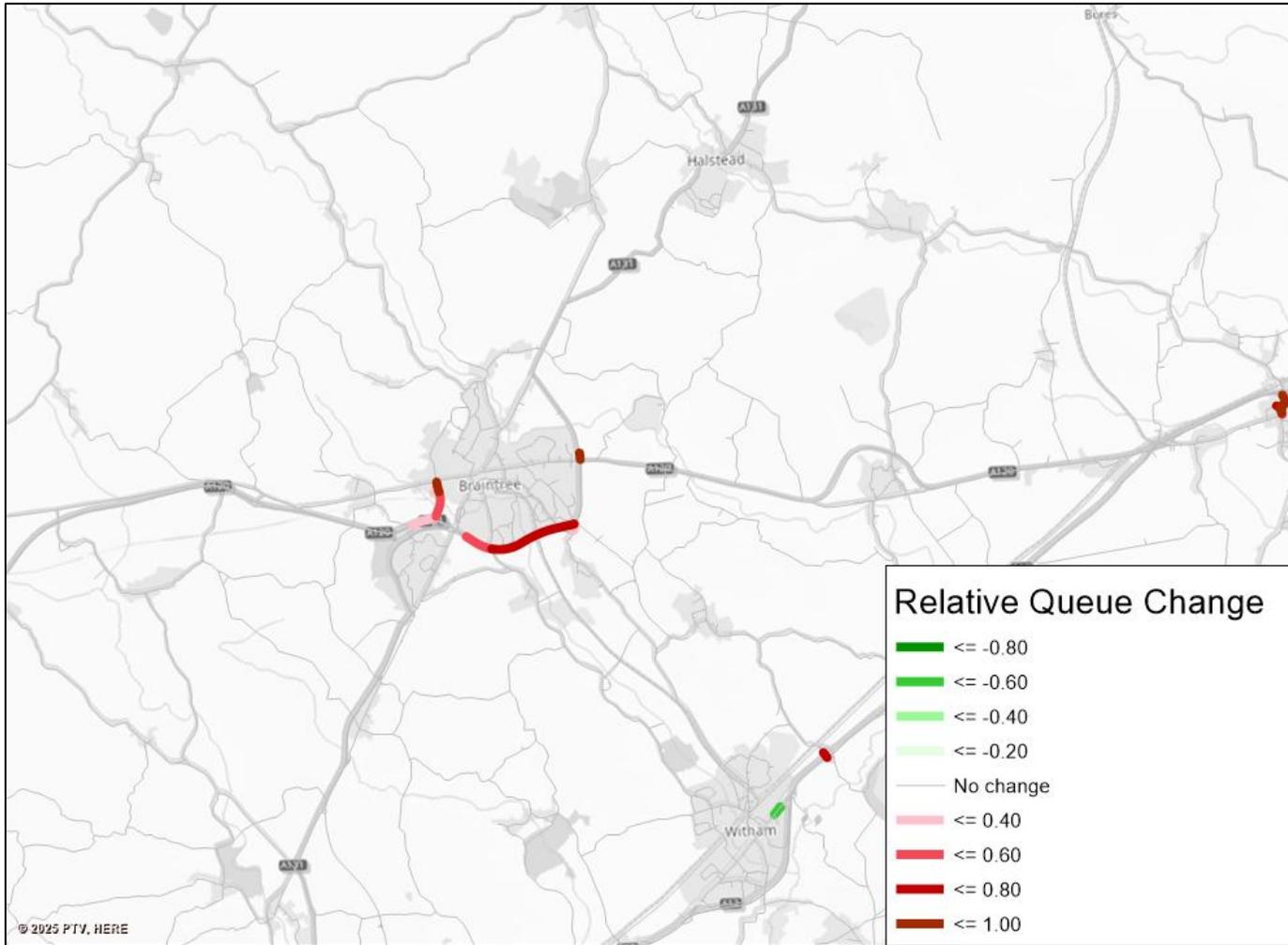
Figure 4-6: Reference Case (2041) vs Base Year (2023) – Relative Queue changes – PM

5.   Assessment Case

5.1   Introduction

This chapter describes the approach to developing the Assessment Case models, including details on the demand and network assumptions. It should be noted that the Assessment Case is not run through the VDM.

5.2   Forecast Demand

5.2.1   Household and job assumptions

The proposed site allocations will grow households and jobs in Braintree beyond the Reference Case estimate. Growth elsewhere remains at reference case levels. The table below shows growth assumptions for the Preferred Spatial Option, and the individual sites are listed in Appendix B.

Table 5-1: Spatial Option Dwellings and Jobs, 2041

Council Area	Households	Jobs
Braintree	11,690	9,671

The location of the development in the Preferred Spatial Option is shown in the figure below.
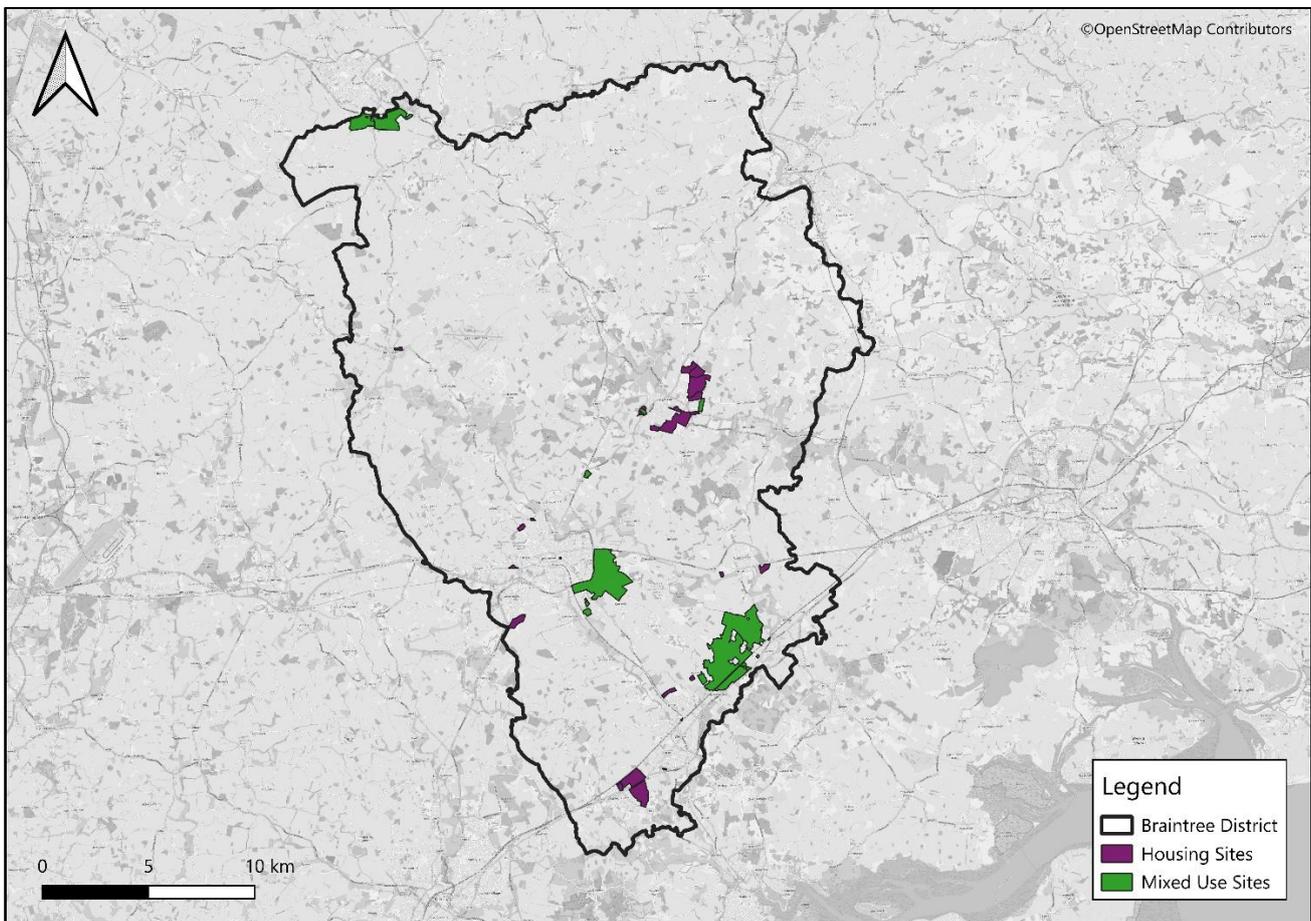
Figure 5-1: Preferred Spatial Option – Housing and Mixed Use Sites, 2041

5.2.2   Trip generation

Similar to the Reference Case trip generation, the trip generation for the Preferred Spatial Option allocations was calculated utilising the alternative planning assumptions module in TEMPro. Since TEMPro provides trip growth assumptions at the MSOA level, these have been further adjusted to apply a greater proportion of growth to the model zones within those MSOAs where developments are located.

The trip generation was converted from 24-hour production/attraction format to time-period specific origin/ destination format. This conversion was required as the assessment scenarios are not run through the VDM. The demand for the proposed site allocations was then added directly on top of the post-VDM Reference Case demand.

5.2.3   Trip distribution

The proposed site allocations have been incorporated into existing model zones. The trip distribution for the Preferred Spatial Option is therefore based on the trip distribution of the existing model zones within which the sites fall. Figure 5-2 below shows an example of the AM peak hour trip distribution used for the development "Land north of A12, Hatfield Peverel, Land at Bovington's Farm, Hatfield Peverel" (900 dwellings), which is based on the trip distribution of zone 378 which it falls within.
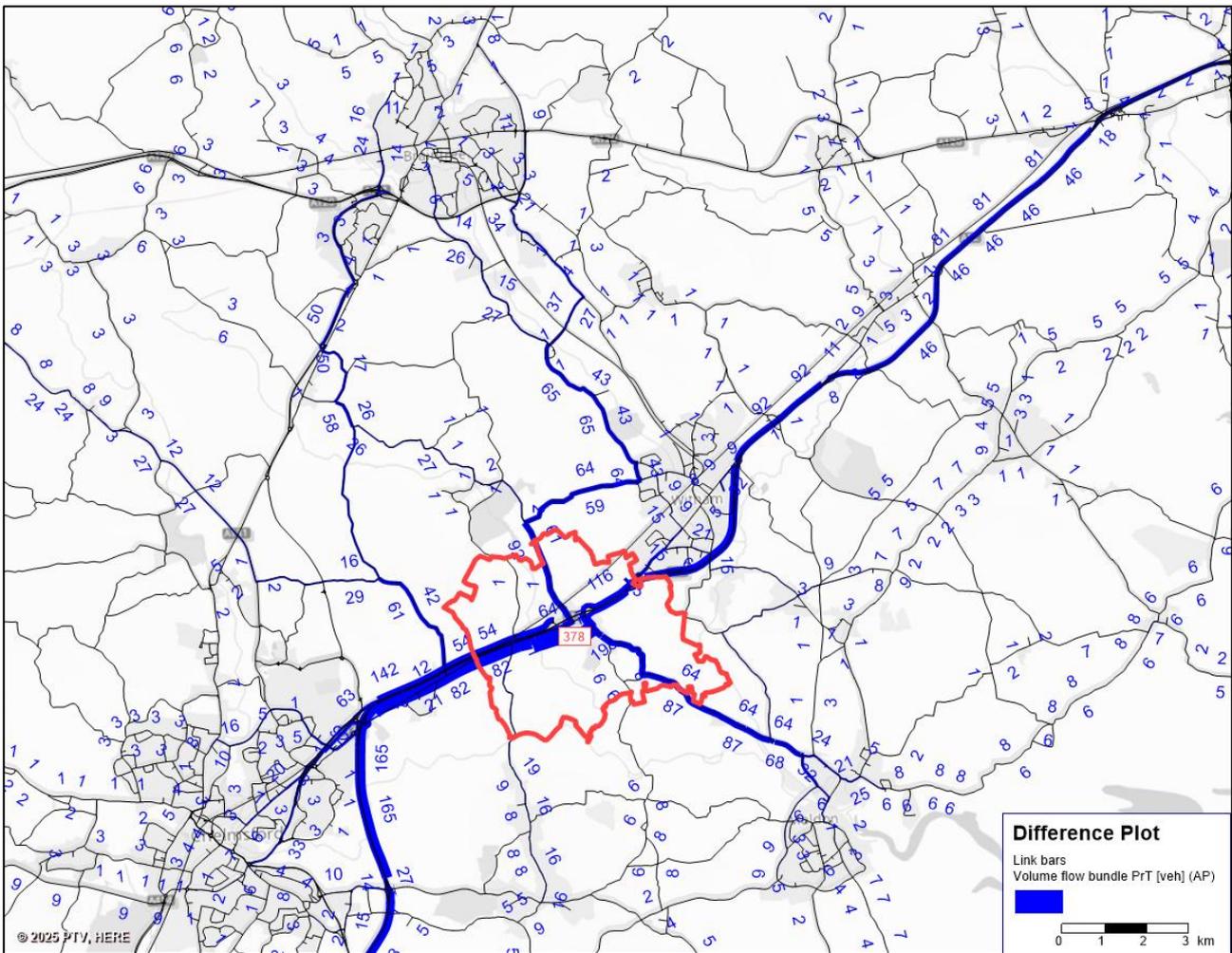
Figure 5-2: Trip distribution zone 378, 2041

5.3   Forecast Network

The only network changes between the Reference Case and Assessment Case are the addition of new zone connectors to represent the locations where the proposed site allocations access the network.

6. Assessment Case vs Reference Case

6.1 Introduction

This chapter compares the Assessment Case and Reference Case model outputs, including changes in flow (Section 5.2), speed (Section 5.3) and queues (Section 5.4).

6.2 Flow Difference

Figure 6-1 and Figure 6-2 illustrate the flow differences between the Assessment Case and Reference Case models during the AM and PM peak hours respectively. The values have been rounded to the nearest ten vehicles.

In both time periods the inclusion of the spatial option developments results in increases of 140 vehicles per hour on the A1124 between Halstead and the A12. There are also increases in flow on Braintree Road and Parkhall Road near Gosfield to the north of Braintree, and along the routes between Braintree and Witham such as Faulkbourne Road and Cressing Road.

In the AM peak hour within Braintree, southbound traffic reroutes onto Cressing Road from the B1018, driven by increased northbound traffic on Braintree Road.

In the PM peak hour, there are flow decreases on the A120 westbound due to increased congestion around the junction with London Road.

Figure 6-1: Assessment Case (2041) vs Reference Case (2041) – Flow difference – AM
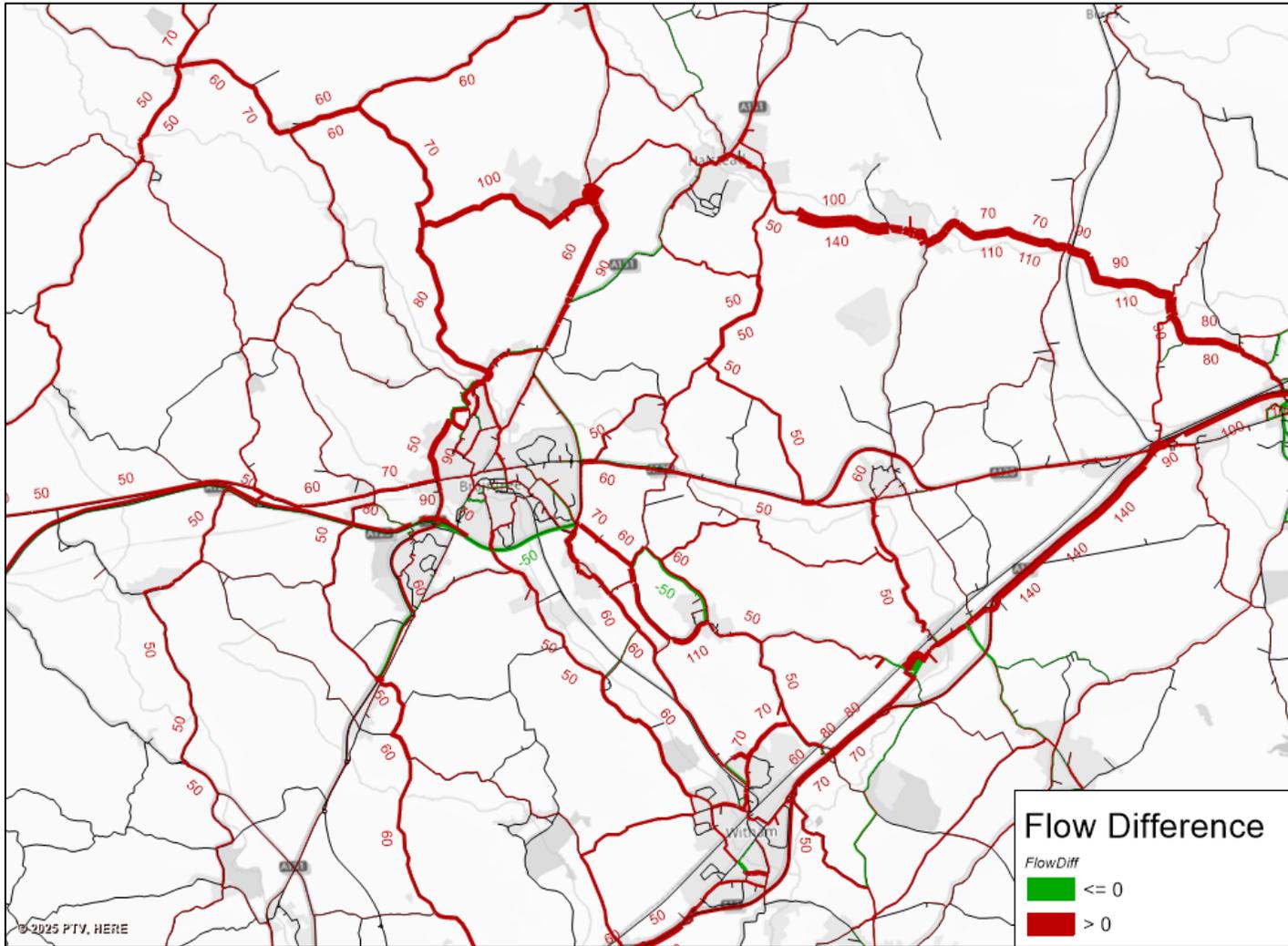
Figure 6-2: Assessment Case (2041) vs Reference Case (2041) – Flow difference – PM

6.3   Speed Ratio Changes

Figure 6-3 and Figure 6-4 illustrate the speed ratio changes between the Assessment Case and Reference Case models during the AM and PM peak hours respectively. The absolute speed ratio plots for these scenarios are shown in Appendix C (opposed to change between scenarios).

Changes in speed ratio indicate reduced speeds in locations already experiencing delays in the Reference Case, leading to further performance deterioration in the Assessment Case. In the AM peak period, lower speeds are recorded on the Halstead Road southbound approach to High Garrett, as well as on the Kings Lane approach to Coggeshall Road. At Galley's Corner roundabout there are speed reductions on the Braintree Road and Millennium Way approaches. Additional reductions in speed are observed on Oak Road in Rivenhall, Coggeshall Road in Feering, and Inworth Road in Kelvedon.

In the PM peak period, there is a reduction in speed along the A120 westbound at the junction with London Road. Within Braintree, lower speeds are also evident on Notley Road northbound approaching South Street. There are also speed reductions at the Millennium Way/Braintree Road roundabout and on the A131 south of Great Notley.
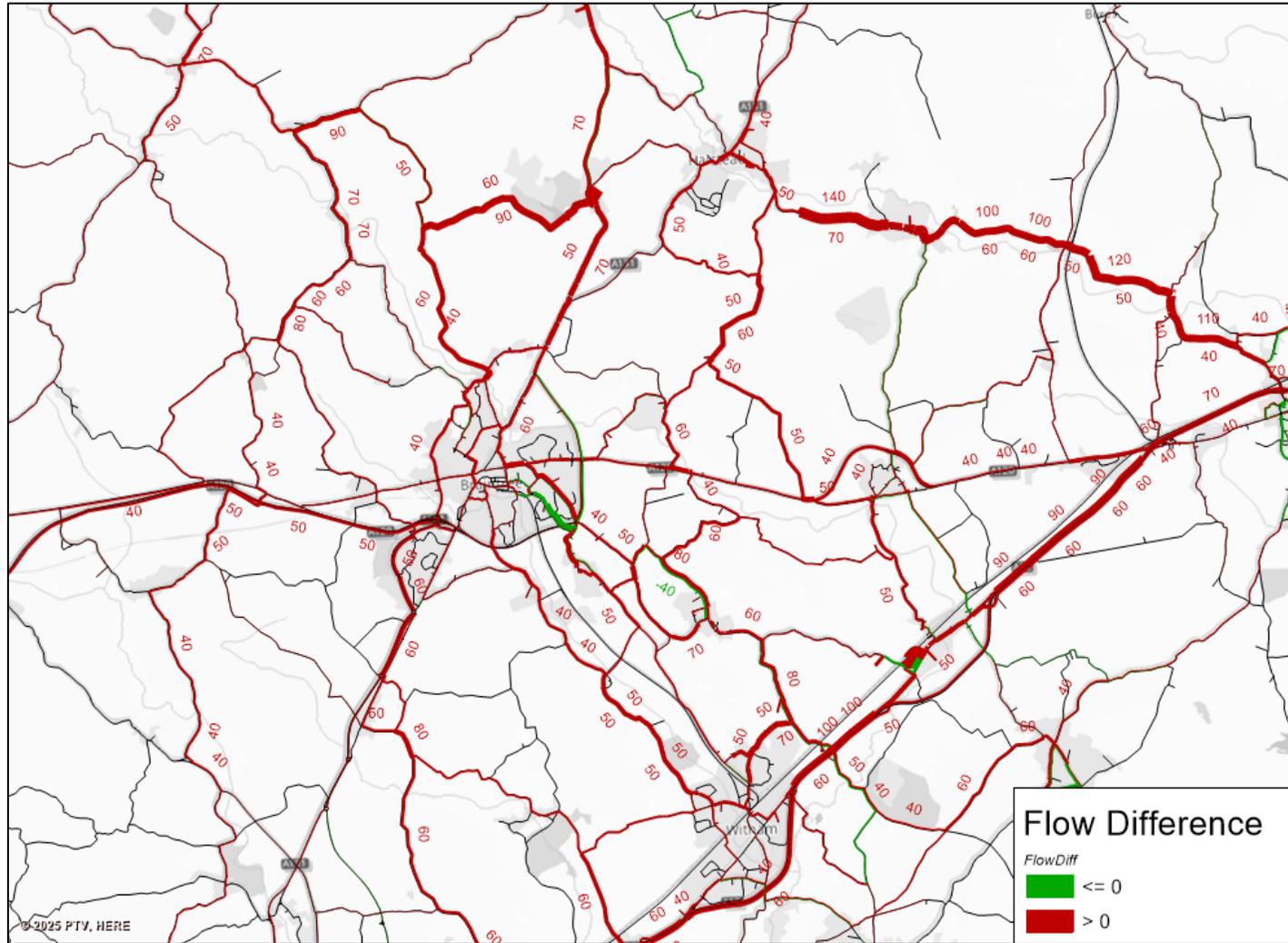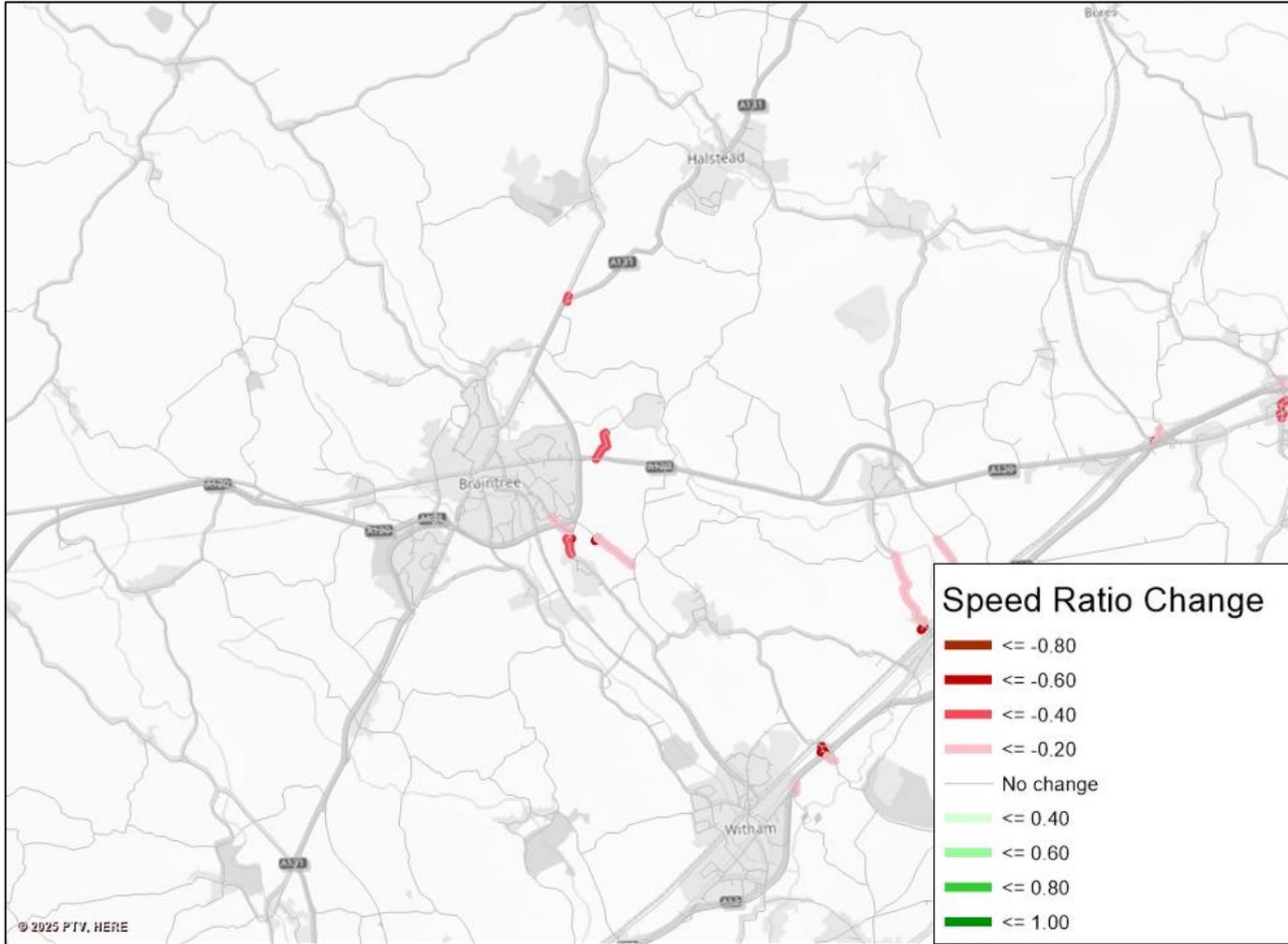
Figure 6-3: Assessment Case (2041) vs Reference Case (2041) – Speed Ratio changes – AM
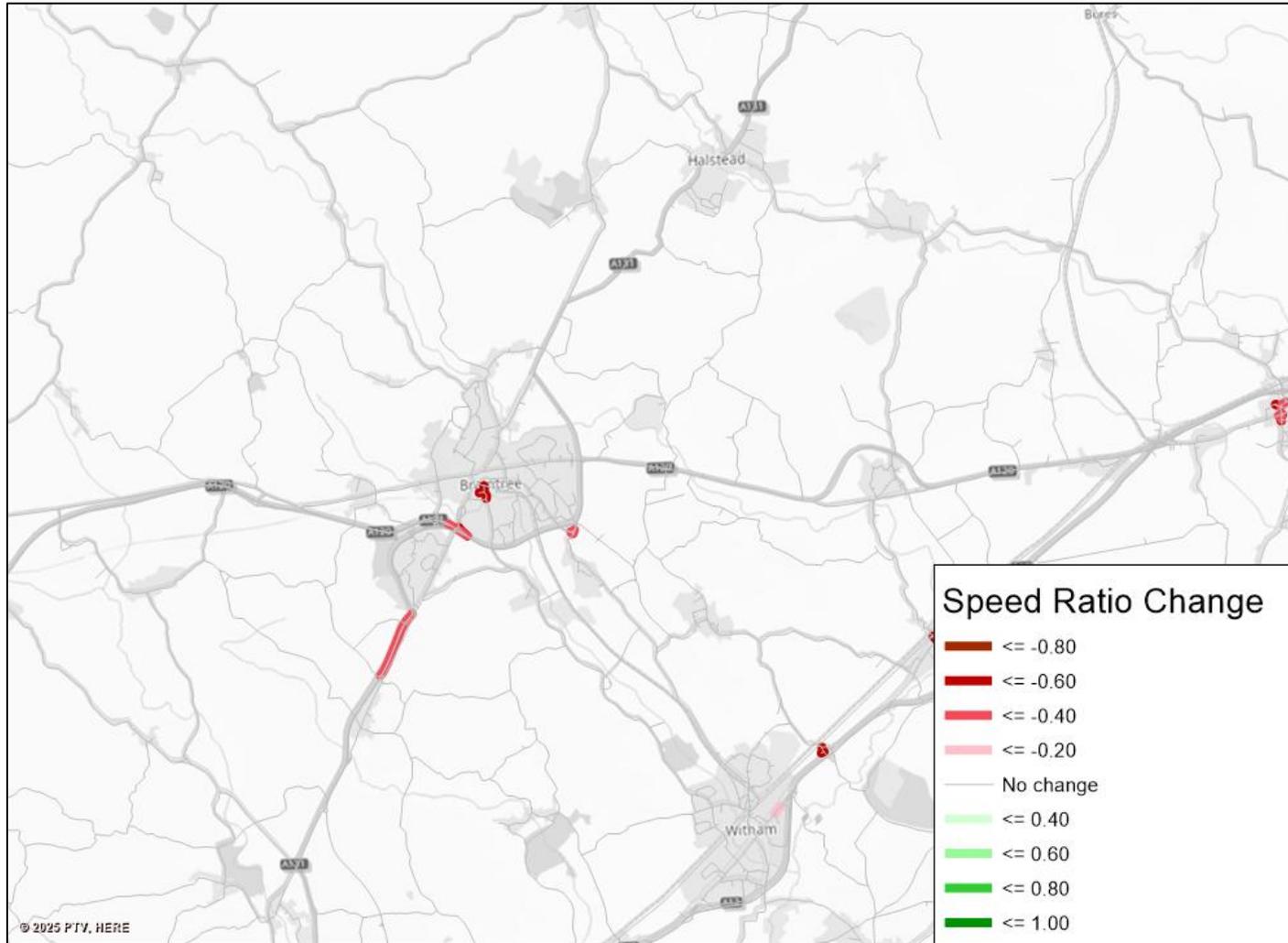
Figure 6-4: Assessment Case (2041) vs Reference Case (2041) – Speed Ratio changes – PM

6.4   Relative Queue Changes

Figure 6-5 and Figure 6-6 illustrate the relative queue changes between the Assessment Case and Reference Case models during the AM and PM peak hours respectively. The absolute relative queue plots for these scenarios are shown in Appendix D (opposed to change between scenarios).

Results indicate that during the AM peak period, relative queueing increases along Braintree Road near Galley's Corner roundabout, as well as on the Halstead Road approach to High Garrett. South of Braintree, additional queueing is observed on the Oak Road approach to the A12 in Rivenhall, and along Coggeshall Road and Inworth Road in Feering.

In the PM peak period, queues increase westbound along the A120 on the approach to the junction with London Road. There are also increased queues on the B1018 as a result of congestion at Galley's Corner roundabout. Within the town centre, queues extend along the Notley Road northbound approach to South Street. As in the AM peak, further increases in queueing are also recorded on routes in Rivenhall, Kelvedon and Feering.

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Figure 6-5: Preferred Option (2041) vs Reference Case (2041) – Relative Queue changes – AM

Figure 6-6: Preferred Option (2041) vs Reference Case (2041) – Relative Queue changes – PM

7. Sensitivity Test

7.1 Introduction

This chapter describes the approach to developing the Sensitivity Test models, including details on the demand and network assumptions. It should be noted that the Sensitivity Test is based on the Assessment Case and is not run through the VDM.

7.2 Forecast Demand

7.2.1 Development Trip Reductions

To model the potential impact of mode shift amongst Local Plan housing and employment trips, a sensitivity test has been undertaken, utilising lower car trip rates commensurate with more urban development and a greater provision of public transport services. The subsequent reduction in car trips has been modelled as an aspirational target, potentially achievable through the provision of robust and attractive sustainable transport infrastructure and services - and their successful uptake.
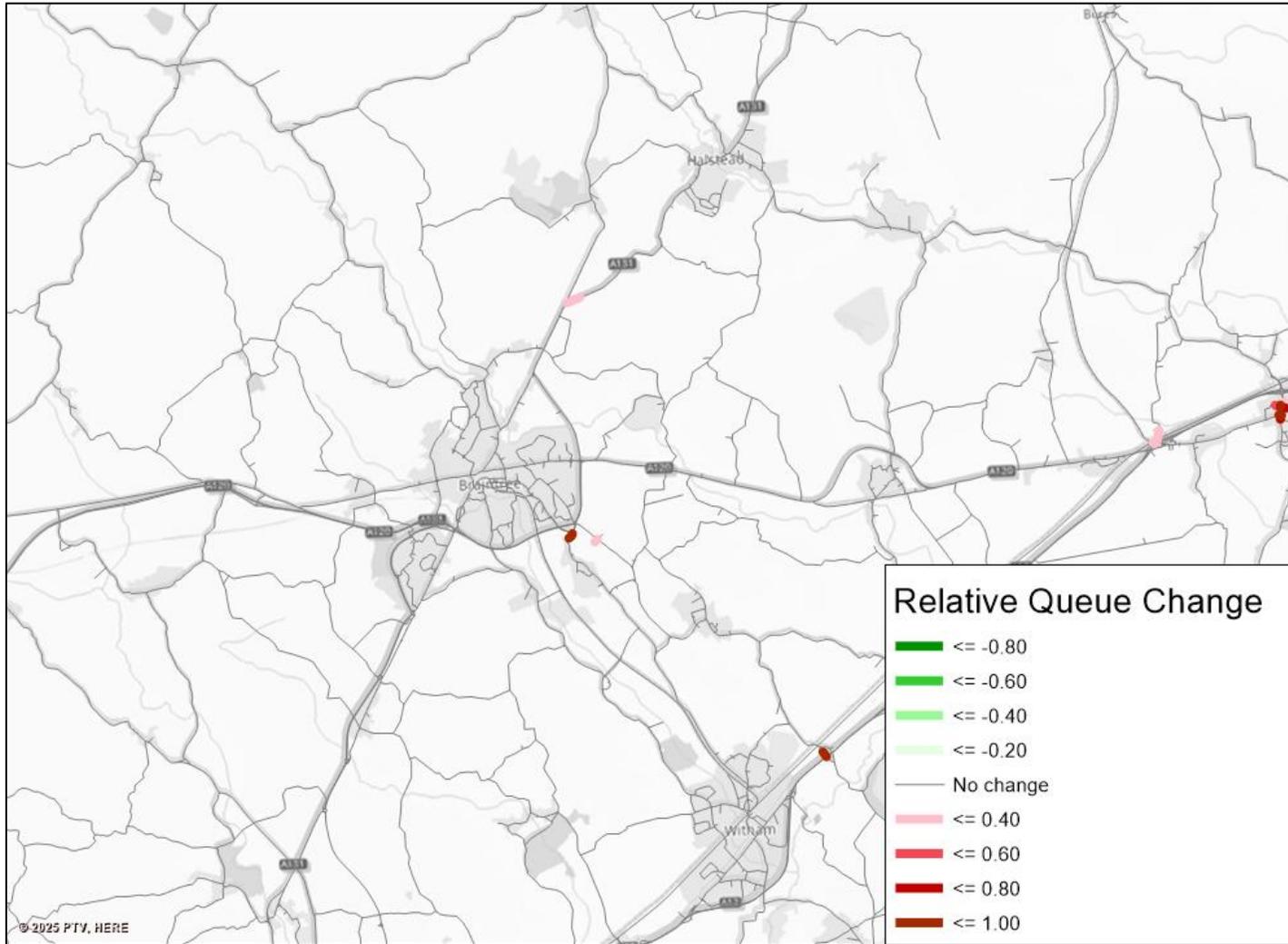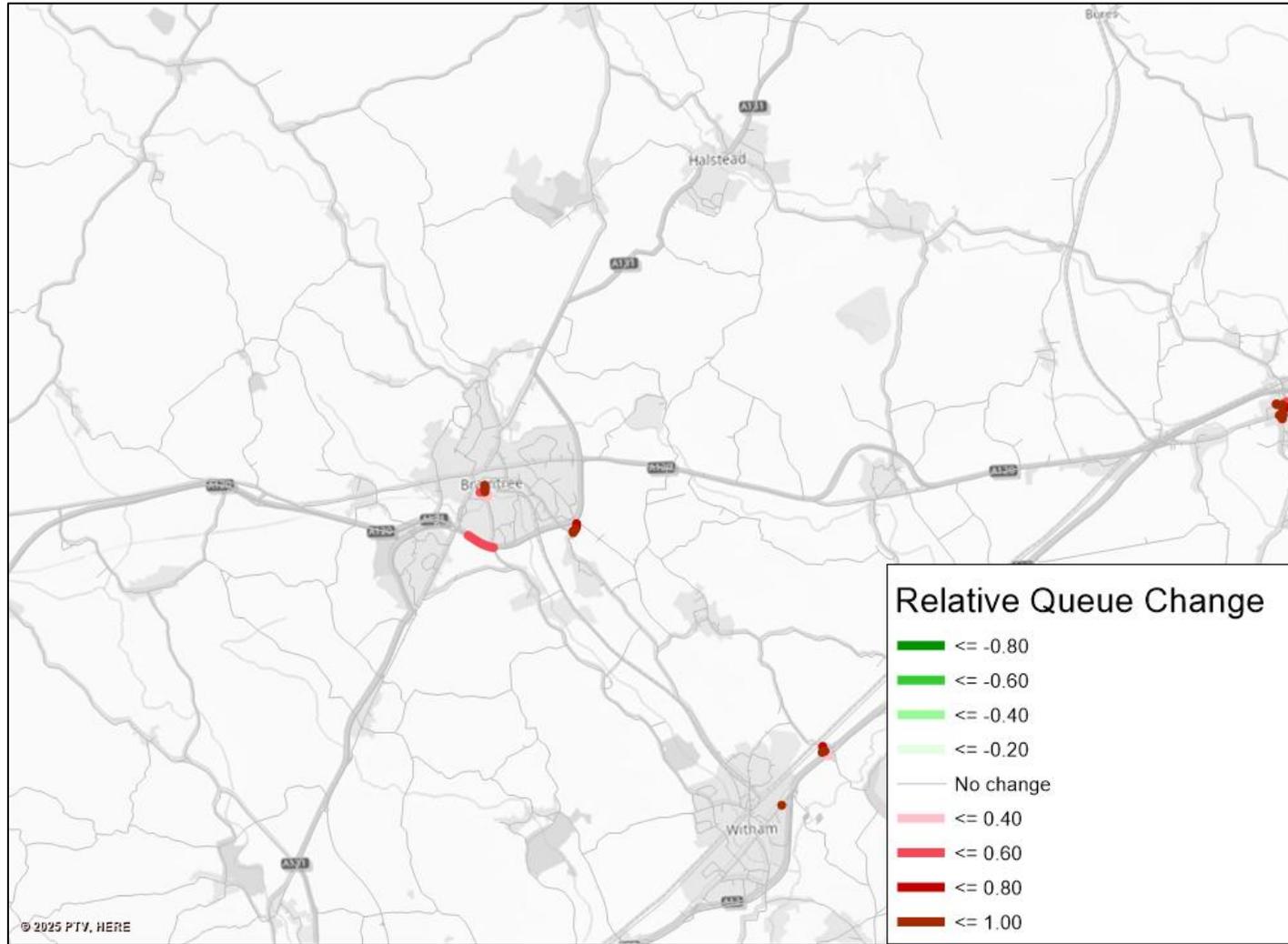
The sensitivity test has been undertaken with an understanding that trip rates for proposed development within the Braintree forecast modelling are already representative of typical levels of sustainable and active travel mode uptake. Thus, to achieve the trip reductions modelled for this sensitivity test, the provision and use of additional public transport services would be required in alignment with NPPF and local policy objectives for a 'sustainability-first' approach.

Development trip reductions have been calculated using EPTAL (Essex Passenger Transport Accessibility Level) which is a bespoke tool created by Essex Highways and loosely based on the DfT's PTAL process, used to derive trip rates around aspirational targets for sustainable transport provision. EPTAL is acknowledged to be a high-level tool to provide indicative analysis of sustainable mode shift outcomes based on limited knowledge of Local Plan mitigation proposals. Once specific measures have been identified to encourage sustainable travel in Braintree District, a more detailed sensitivity test will be undertaken to accommodate nuanced and location-specific trip reductions applied to both Local Plan development and background trips.

EPTAL contains a database of TRICS surveyed development trip rates grouped by location classification: Rural, Edge of Town, Suburban, Edge of Town Centre and Town/City Centre.

The tool then calculates average trip rates across all surveyed sites for each land-use type within each location classification and determines the associated quantum of local rail and/or bus services required to achieve these trip rates – based on passenger transport provision data from the TRICS surveys.

Using EPTAL, it has been possible to determine average trip rates and a typical level of passenger transport provision for housing and employment sites in a Suburban location. This classification was seen as representative of the location and level of passenger transport provision currently proposed for Braintree Local Plan developments in the large development sites proposed at Kings Dene and East Braintree (for example).

Average trip rates and a typical level of bus/rail provision were then determined for housing and employment sites in an Edge of Town Centre location. These values were viewed as a suitable aspirational target for Local Plan development as part of the sensitivity test.

Table 7-1 overleaf shows the trip rates generated by EPTAL for the employment and residential developments for both Suburban and Edge of Town Centre sites and the percentage difference between them.

A 13% decrease in residential trip rates and 6% decrease in employment trip rates was identified by calculating the percentage decrease between the existing and desired land classifications. These factors were then applied to the total number of trips generated by the Preferred Spatial Option as part of the Sensitivity Test.

Table 7-1: Derived EPTAL Trip Rates

Type	Suburban Trip Rates	Edge of Town Trip Rates	% Reduction from Suburban to Edge of Town
Residential Houses: Privately Owned	0.121	0.105	13%
Employment (office)	1.239	1.168	6%

The trips shifting to sustainable modes have been removed from the development trip demand matrices to create an adjusted demand for both "car commute" and "car other" purposes. It has been assumed that the "car employers' business" will not be affected by mode shift. The total number of trips removed from the demand matrices are shown in Table 7-2 below.

Table 7-2: Sustainable Travel Trip Reductions

Demand Segment	AM Peak	PM Peak
Car Commute	169	144
Car Other	201	272

7.3   Forecast Network

The Sensitivity Test networks are identical to the Assessment Case networks.

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8. Sensitivity Test vs Assessment Case

8.1 Introduction

This chapter compares the Sensitivity Test and Assessment Case model outputs, including changes in flow (Section 7.2), speed (Section 7.3) and queues (Section 7.4).

8.2 Flow Difference

Figure 8-1 and Figure 8-2 illustrate the flow differences between the Sensitivity Test and Assessment Case models during the AM and PM peak hours respectively. The values have been rounded to the nearest 5 vehicles.

The reduction in development trips leads to a decrease in overall vehicle flow on links across the network during both the AM and PM peak periods. The largest changes occur near the development access points, including the A1124 between Halstead and the A12, Parkhall Road near Gosfield and Witham Road south of Braintree.

Minor increases on some routes are the result of improved conditions at previously congested locations, allowing limited rerouting. In the AM peak, southbound traffic diverts onto the B1018 from Cressing Road due to reduced flows from Braintree Road. In the PM peak, increases are observed on the A120 westbound approaching between Galley's Corner and London Road and on the A131 approach to Marks Farm roundabout.

It should be reiterated that the modelled trip reductions shown across the Braintree District road network are representative of a proportion of Local Plan development trips, only, switching from car to sustainable modes of travel. As such, the change in vehicles flows modelled is shown to be small. The Sensitivity Test scenario demonstrates that whilst sustainable transport measures have the potential to reduce traffic flows from the Local Plan development, the scale of these reductions will unlikely offset development traffic increases at key hotspots on the road network – and not without the improved public transport and active travel measures being promoted to, and utilised by, existing residents of Braintree District .
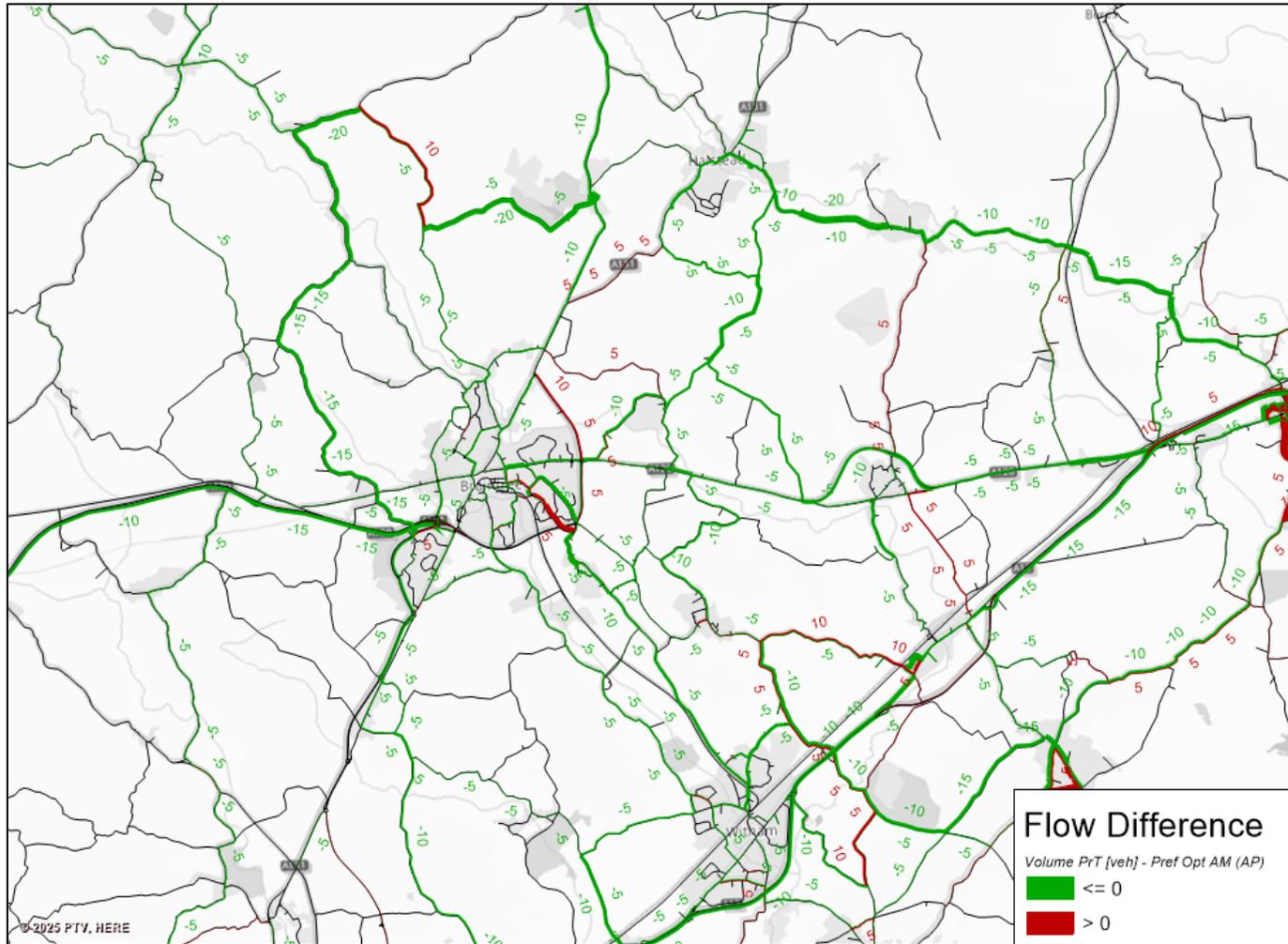
Figure 8-1: Preferred Option ST (2041) vs Preferred Option (2041) – Flow difference – AM
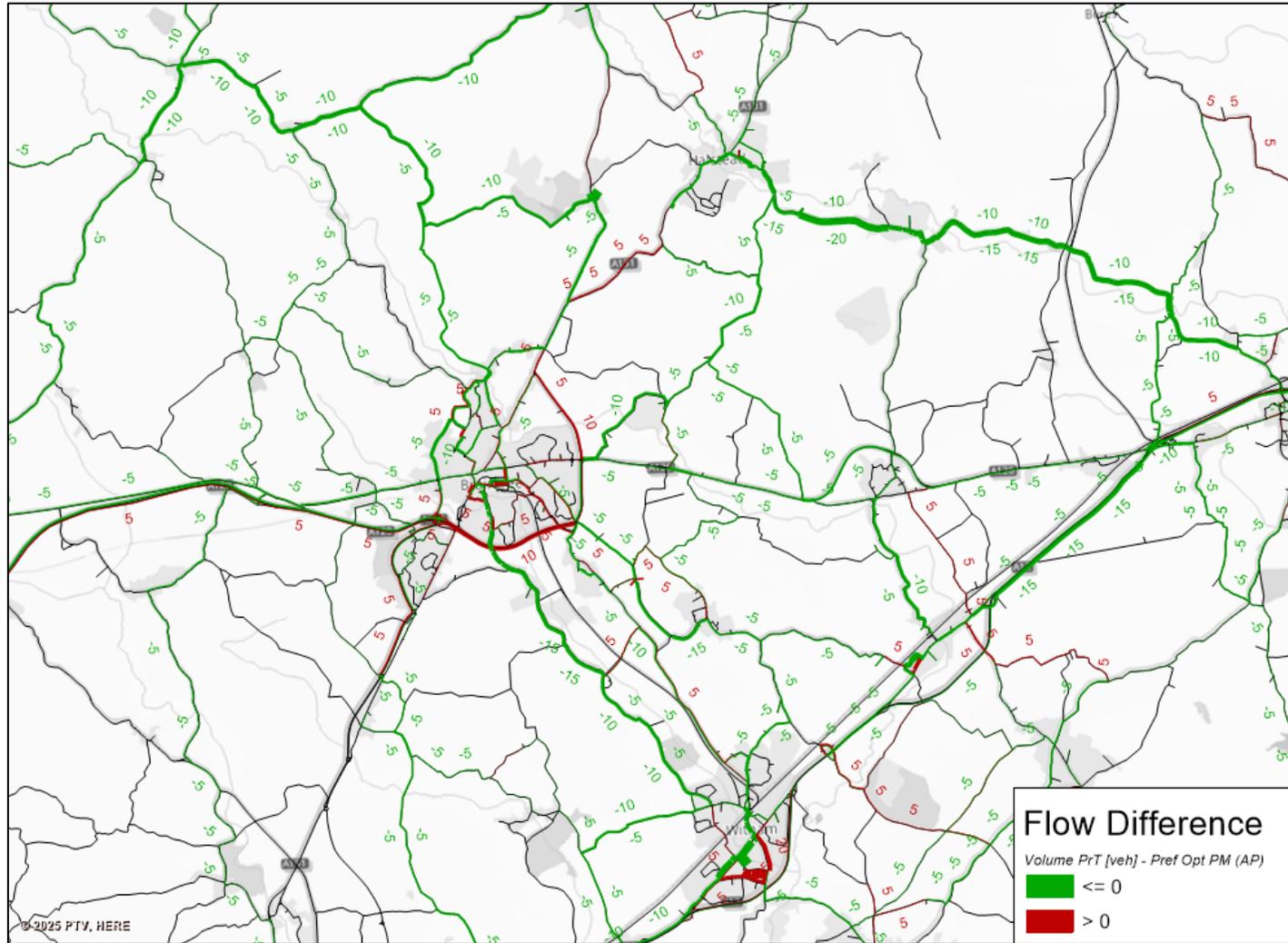
Figure 8-2: Preferred Option ST (2041) vs Preferred Option (2041) – Flow difference – PM

8.3   Speed Ratio Changes

The reduction in trips in the sensitivity test does not result in any notable changes to speed ratios, aside from a slight improvement during the AM peak on the Halstead Road approach to High Garrett and on the Oak Road approach to the A12 in Rivenhall.

8.4   Relative Queue Changes

The reduction in demand in the sensitivity test does not result in any notable changes to relative queueing, apart from improvements in the PM peak period on the Notley Road approach to South Street in Braintree town centre, and a reduction in queueing at the Millennium Way/ Braintree Road roundabout.

9.   Summary and Conclusion

The following 2041 forecast scenarios have been prepared to support Braintree District Council's Local Plan transport evidence base:

- Reference Case Scenario without the Preferred Spatial Option site allocations

- Assessment Case Scenario, which includes the residential and employment development associated with the Preferred Spatial Option

- Assessment Case Scenario Sensitivity Test, which includes a reduced travel demand which could be achieved through the provision of sustainable measures

This report details the key assumptions underpinning the growth and transport schemes included in each scenario and explains how these assumptions have been applied within the transport model. It also presents a range of model outputs to understand the impact of the development on the highway network.

In the Assessment Case scenario, the inclusion of the Preferred Spatial Option development results in increased modelled journey time delay and vehicle queues at key pinch points on the road network – notably the A120, A131 and town centre routes in Braintree and Witham – compared with the Reference Case.

The Sensitivity Test scenario demonstrates that whilst sustainable transport measures have the potential to reduce traffic flows from the Local Plan development, the scale of these reductions will unlikely offset development traffic increases at key hotspots on the road network – and not without public transport and active travel measures being promoted to, and successfully utilised by, existing residents of Braintree District.

Initial strategic-level modelling suggests that a combination of optimised sustainable transport measures along with targeted highway infrastructure improvements on both the strategic and Braintree and Witham town centre road networks will likely need to be developed further at the Regulation 19 stage. Traffic modelling should also be undertaken at a local junction level to facilitate scheme appraisal and determine a feasible package of measures to help mitigate the impact of development associated with the Preferred Spatial Option.

Appendix A. Braintree 2041 Reference Case Development

Name	Model Zone	MSOA	Development Type	Dwl	Jobs
Land north of Colchester Road	234	Braintree 014	Housing	300	0
Millview Park Land off Church Street, North of Grove Field High Garrett	350	Braintree 007	Housing	253	0
The Maples, Land between Long Green and Braintree Road, Long Green	228	Braintree 012	Housing	250	0
Phase 4 Land NE of Rectory Lane	220	Braintree 015	Housing	225	0
Station Field, Land west of Kelvedon Station Station Road (Monks Farm)	238	Braintree 014	Housing	206	0
Land off Western Road	222	Braintree 015	Housing	204	0
Bournewood Park, Land off Bournebridge Hill Greenstead Green	371	Braintree 003	Housing	197	0
Land West of Panfield Lane	344	Braintree 008	Housing	189	0
Phase 3 Towerlands Park	350	Braintree 007	Housing	179	0
Phases 3B, 4 South West Witham Growth Location, off Hatfield Road	353	Braintree 017	Housing	176	0
Phase 1 Towerlands Park	350	Braintree 007	Housing	168	0
Land adjacent to Braintree Road	228	Braintree 012	Housing	164	0
Phase 2 Towerlands Park	350	Braintree 007	Housing	162	0
Land north of Conrad Road	357	Braintree 015	Housing	148	0
Land West of Boars Tye Road	226	Braintree 012	Housing	94	0
Priory Grange, Land south of Stonepath Drive	378	Braintree 018	Housing	82	0

Land North of Oak Road (Oak Field Tidings Hill)	351	Braintree 004	Housing	80	0
Land West of Mill Lane	228	Braintree 012	Housing	78	0
Land West of Mount Hill	351	Braintree 004	Housing	71	0
Land Rear Of 12 To 24 Halstead Road	374	Braintree 006	Housing	64	0
Land at Appletree Farm Polecat Road	228	Braintree 012	Housing	63	0
Hatfield Bury Farm Bury Lane	378	Braintree 018	Housing	50	0
Land West of Bardfield Road	365	Braintree 005	Housing	50	0
Land north of Rayne Road (Rayne Lodge Farm Phase 2)	344	Braintree 008	Housing	42	0
Land adjacent Watering Farm Coggeshall Road	238	Braintree 014	Housing	35	0
Hazelwood, Land East of Great Notley SGL Black Notley	377	Braintree 013	Housing	1,750	0
Land at Straits Mill Braintree	350	Braintree 007	Housing	1,000	0
Land South of Feering West of A12 Feering, Strategic Growth Location (Crown Estates land)	239	Braintree 014	Housing	835	0
Land West of Panfield Lane	344	Braintree 008	Housing	825	0
Woodend Farm Hatfield Road Witham	378	Braintree 018	Housing	400	0
Towerlands Park	350	Braintree 007	Housing	277	0
Land off Church Street North of Grove Field High Garrett Braintree	350	Braintree 007	Housing	250	0
Land at Long Green Cressing	228	Braintree 012	Housing	200	0
Lodge Farm Witham	353	Braintree 017	Housing	199	0
Land North of Colchester Road Coggeshall	234	Braintree 014	Housing	145	0
Land north of Western Road Silver End	222	Braintree 015	Housing	115	0

Crittall Works site Silver End	224	Braintree 012	Housing	65	0
The old wood yard site Fenn Road Halstead	380	Braintree 004	Housing	54	0
Land off Braintree Road Cressing	228	Braintree 012	Housing	47	0
Land adjacent Blamsters Farm Mount Hill Halstead	351	Braintree 004	Housing	44	0
Former Tanners Dairy Prayors Hill Sible Hedingham	370	Braintree 003	Housing	44	0
Land at Appletree Farm Polecat Road Cressing	228	Braintree 012	Housing	41	0
Land South of Feering West of A12 Feering	239	Braintree 014	Housing	40	0
Station Field, Land West of Kelvedon Station Kelvedon	238	Braintree 014	Housing	38	0
Land North of Oak Road Halstead	351	Braintree 004	Housing	34	0
4 & 6 Chipping Hill and Chipping Hill Industrial Estate	357	Braintree 015	Housing	30	0
Coggeshall	231/234/236/233	Braintree 014	Housing	37	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 008	Housing	74	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 009	Housing	74	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 011	Housing	74	0
Cressing	228	Braintree 012	Housing	18	0
Kelvedon	237	Braintree 014	Housing	70	0
Witham	357/359/354/355/356/358/379/353	Braintree 015	Housing	40	0

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Witham	357/359/354/355/356/358/379/353	Braintree 016	Housing	40	0
Witham	357/359/354/355/356/358/379/353	Braintree 017	Housing	40	0
Halstead	351/380/372/373	Braintree 004	Housing	135	0
Hatfield Peverel	378	Braintree 018	Housing	35	0
Earls Colne	374	Braintree 006	Housing	67	0
Finchingfield	365	Braintree 005	Housing	30	0
Great Yeldham	369	Braintree 001	Housing	29	0
Gosfield	371	Braintree 003	Housing	54	0
Great Notley	343/375/376	Braintree 013	Housing	42	0
Bradwell	226	Braintree 012	Housing	19	0
Belchamp St Paul	230	Braintree 002	Housing	7	0
Steeple Bumpstead	368	Braintree 001	Housing	49	0
Bardfield Saling	366	Braintree 005	Housing	8	0
Gestingthorpe	230	Braintree 002	Housing	6	0
Shalford	366	Braintree 005	Housing	26	0
Birdbrook	369	Braintree 001	Housing	6	0
Belchamp Walter	230	Braintree 002	Housing	8	0
Wickham St Paul	230	Braintree 002	Housing	7	0
Great Bardfield	365	Braintree 005	Housing	12	0
Bures Hamlet	229/252/251	Braintree 002	Housing	6	0
Middleton	230	Braintree 002	Housing	3	0
Pentlow	230	Braintree 002	Housing	4	0
Bulmer	230	Braintree 002	Housing	16	0
Stisted	227	Braintree 012	Housing	6	0
Toppesfield	369	Braintree 001	Housing	4	0

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Fairstead	241	Braintree 018	Housing	3	0
Great Saling	366	Braintree 005	Housing	2	0
Rayne	366	Braintree 010	Housing	4	0
Belchamp Otten	230	Braintree 002	Housing	1	0
Twinstead	230	Braintree 002	Housing	2	0
Ovington	230	Braintree 002	Housing	1	0
Bures	229/252/251	Braintree 002	Housing	1	0
Panfield	366	Braintree 005	Housing	2	0
Stambourne	369	Braintree 001	Housing	2	0
Sturmer	368	Braintree 001	Housing	1	0
Tilbury Juxta Clare	230	Braintree 003	Housing	1	0
Toppesfield	369	Braintree 003	Housing	1	0
High Garrett	350	Braintree 007	Housing	-1	0
Black Notley	377	Braintree 013	Housing	0	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 008	Housing	15	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 009	Housing	15	0
Braintree	344/361/345/348/363/349/346/364/341/342/347/362/349/343/375/376	Braintree 011	Housing	15	0
Coggeshall	231/234/236/233	Braintree 014	Housing	20	0
Cressing	228	Braintree 012	Housing	0	0
Earls Colne	374	Braintree 006	Housing	18	0
Feering	239	Braintree 014	Housing	0	0
Halstead	351/380/372/373	Braintree 004	Housing	102	0
Hatfield Peverel	378	Braintree 018	Housing	11	0

Kelvedon	237	Braintree 014	Housing	13	0
Sible Hedingham	370	Braintree 003	Housing	0	0
Silver End	224/222	Braintree 012	Housing	0	0
Witham	357/359/354/355/356/358/379/353	Braintree 015	Housing	23	0
Witham	357/359/354/355/356/358/379/353	Braintree 016	Housing	23	0
Witham	357/359/354/355/356/358/379/353	Braintree 017	Housing	23	0

Appendix B. Braintree 2041 Assessment Case Development

Name	Model Zone	MSOA	Development Type	Dwl	Jobs
Kings Dene at North Kelvedon	219/221/238	Braintree 014	Housing	1,388	0
Kings Dene at North Kelvedon	219/221/238	Braintree 015	Housing	463	0
Kings Dene at North Kelvedon	219/221/238	Braintree 014	B1a/b	0	555
Kings Dene at North Kelvedon	219/221/238	Braintree 014	B1	0	478
Kings Dene at North Kelvedon	219/221/238	Braintree 014	B2	0	671
Kings Dene at North Kelvedon	219/221/238	Braintree 014	B8	0	428
Kings Dene at North Kelvedon	219/221/238	Braintree 015	B1a/b	0	185
Kings Dene at North Kelvedon	219/221/238	Braintree 015	B1	0	159
Kings Dene at North Kelvedon	219/221/238	Braintree 015	B2	0	224
Kings Dene at North Kelvedon	219/221/238	Braintree 015	B8	0	143
Land North and East of Halstead, Land East of Bluebridge Ind Estate	371/372/373/374	Braintree 003	Housing	1,304	0
Land North and East of Halstead, Land East of Bluebridge Ind Estate	371/372/373/374	Braintree 006	Housing	326	0
Land East of Bluebridge Ind Estate	374	Braintree 006	B1a/b	0	349
Land East of Bluebridge Ind Estate	374	Braintree 006	B1	0	301
Land East of Bluebridge Ind Estate	374	Braintree 006	B2	0	422
Land East of Bluebridge Ind Estate	374	Braintree 006	B8	0	269
Land to South East of Halstead, Land East of Colchester Road, Halstead	371/372	Braintree 003	Housing	605	0
Land to South East of Halstead, Land East of Colchester Road, Halstead	371/372	Braintree 006	Housing	495	0
Land East of Colchester Road, Halstead	371	Braintree 003	B1a/b	0	518
Land East of Colchester Road, Halstead	371	Braintree 003	B1	0	446
Land East of Colchester Road, Halstead	371	Braintree 003	B2	0	625
Land East of Colchester Road, Halstead	371	Braintree 003	B8	0	399
Last East of Braintree	227/228	Braintree 012	Housing	1,350	0
Land north of A12, Hatfield Peverel, Land at Bovington's Farm, Hatfield Peverel	378	Braintree 018	Housing	900	0
Land south of Haverhill	368	Braintree 001	Housing	1,350	0
John Pease Manor St	346	Braintree 009	Housing	45	0
Land at Friers Farm	377	Braintree 013	Housing	480	0

Land adj to the Coach House, Panfield Lane	344/350	Braintree 007	Housing	26	0
Land adj to the Coach House, Panfield Lane	344/350	Braintree 008	Housing	18	0
Land East of A131	350	Braintree 007	Housing	125	0
Land East of A132	350	Braintree 007	B1a/b	0	200
Land East of A132	350	Braintree 007	B1	0	172
Land East of A132	350	Braintree 007	B2	0	242
Land East of A132	350	Braintree 007	B8	0	154
Land South of Springfields	341	Braintree 010	Housing	74	0
Land South Colchester Rd	234/235/236	Braintree 014	Housing	200	0
Land to the south of West St	235	Braintree 014	Housing	80	0
Mill Lane	228	Braintree 012	Housing	78	0
Mill Lane	228	Braintree 012	B1a/b	0	263
Mill Lane	228	Braintree 012	B1	0	227
Mill Lane	228	Braintree 012	B2	0	318
Mill Lane	228	Braintree 012	B8	0	203
Land north of the B1053, Finchingfield	365	Braintree 005	Housing	107	0
Halstead Hall	371	Braintree 003	Housing	33	0
Land west of Blamsters	371	Braintree 003	Housing	55	0
Land west of Blamsters	371	Braintree 003	B1a/b	0	157
Land west of Blamsters	371	Braintree 003	B1	0	135
Land west of Blamsters	371	Braintree 003	B2	0	190
Land west of Blamsters	371	Braintree 003	B8	0	121
Land south of Windmill Rd	351/371	Braintree 003	Housing	35	0
Land south of Windmill Rd	351/371	Braintree 004	Housing	35	0
The Vineyards, Waltham Road, Hatfield Peverel	378	Braintree 018	Housing	190	0
Land east of Yew Tree Close, Hatfield Peverel	378	Braintree 018	Housing	33	0
West St Domincs London Road	238	Braintree 014	Housing	25	0
West St Domincs London Road	238	Braintree 014	B1a/b	0	43
West St Domincs London Road	238	Braintree 014	B1	0	37
West St Domincs London Road	238	Braintree 014	B2	0	52
West St Domincs London Road	238	Braintree 014	B8	0	33
Land North East of Cranes Lane	238	Braintree 014	Housing	100	0

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Land North East of Cranes Lane	238	Braintree 014	B1a/b	0	186
Land North East of Cranes Lane	238	Braintree 014	B1	0	160
Land North East of Cranes Lane	238	Braintree 014	B2	0	225
Land North East of Cranes Lane	238	Braintree 014	B8	0	144
Car ParkDeal of Kelvedon	237	Braintree 014	Housing	45	0
Car ParkDeal of Kelvedon	237	Braintree 014	B1a/b	0	17
Car ParkDeal of Kelvedon	237	Braintree 014	B1	0	15
Car ParkDeal of Kelvedon	237	Braintree 014	B2	0	21
Car ParkDeal of Kelvedon	237	Braintree 014	B8	0	13
Railway Garage Station Rd	237	Braintree 014	Housing	20	0
Railway Garage Station Rd	237	Braintree 014	B1a/b	0	23
Railway Garage Station Rd	237	Braintree 014	B1	0	20
Railway Garage Station Rd	237	Braintree 014	B2	0	28
Railway Garage Station Rd	237	Braintree 014	B8	0	18
Land North West of Panfield Lane, Braintree	366	Braintree 005	Housing	100	0
Land north of Rickstones Road	219/220	Braintree 015	Housing	45	0
Land north of Gershwin Boulevard	353	Braintree 017	Housing	32	0
Cut Throat Lane Carpark	354	Braintree 017	Housing	100	0
Cut Throat Lane Carpark	354	Braintree 017	B1a/b	0	21
Cut Throat Lane Carpark	354	Braintree 017	B1	0	18
Cut Throat Lane Carpark	354	Braintree 017	B2	0	26
Cut Throat Lane Carpark	354	Braintree 017	B8	0	16
Land North of Witham	223	Braintree 015	Housing	290	0
GRYE2176, GRYE2177 and GRYE2178	369	Braintree 001	Housing	16	0
GRYE2175	369	Braintree 001	Housing	30	0
STEB2285	368	Braintree 001	Housing	10	0
RIDG2511	369	Braintree 001	Housing	24	0
TOPP2294 and TOPP2295	369	Braintree 001	Housing	6	0
BURE2070	230	Braintree 002	Housing	8	0
BOCN2042	350	Braintree 007	Housing	30	0
BCBG2500	364	Braintree 009	Housing	10	0
KELV2221	238	Braintree 014	Housing	10	0

HATF2192	378	Braintree 018	Housing	20	0
Windfall			Housing	975	0

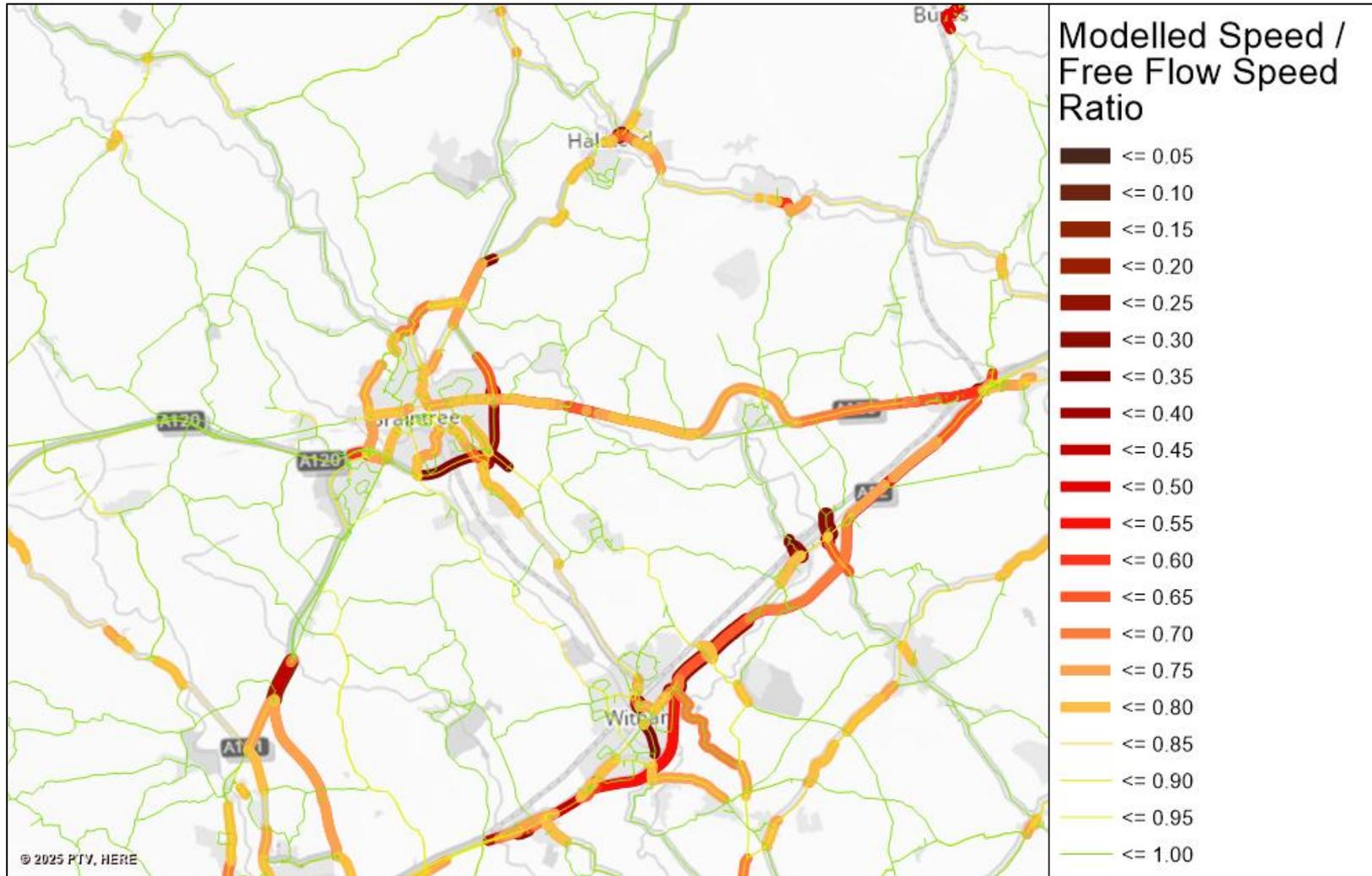# Appendix C. Speed Ratio Plots

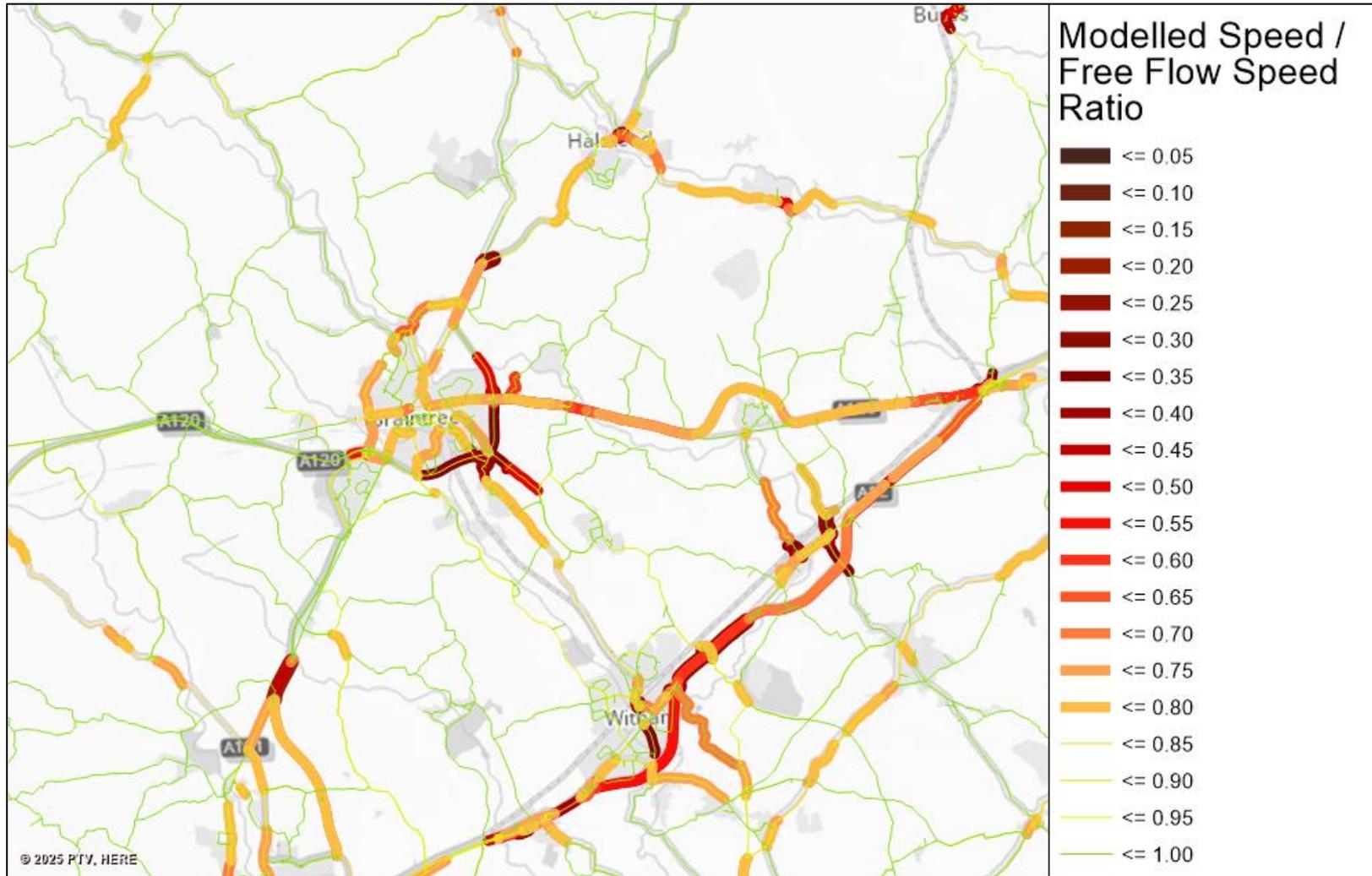**Figure C- 1: Speed Ratio - Reference Case – AM**

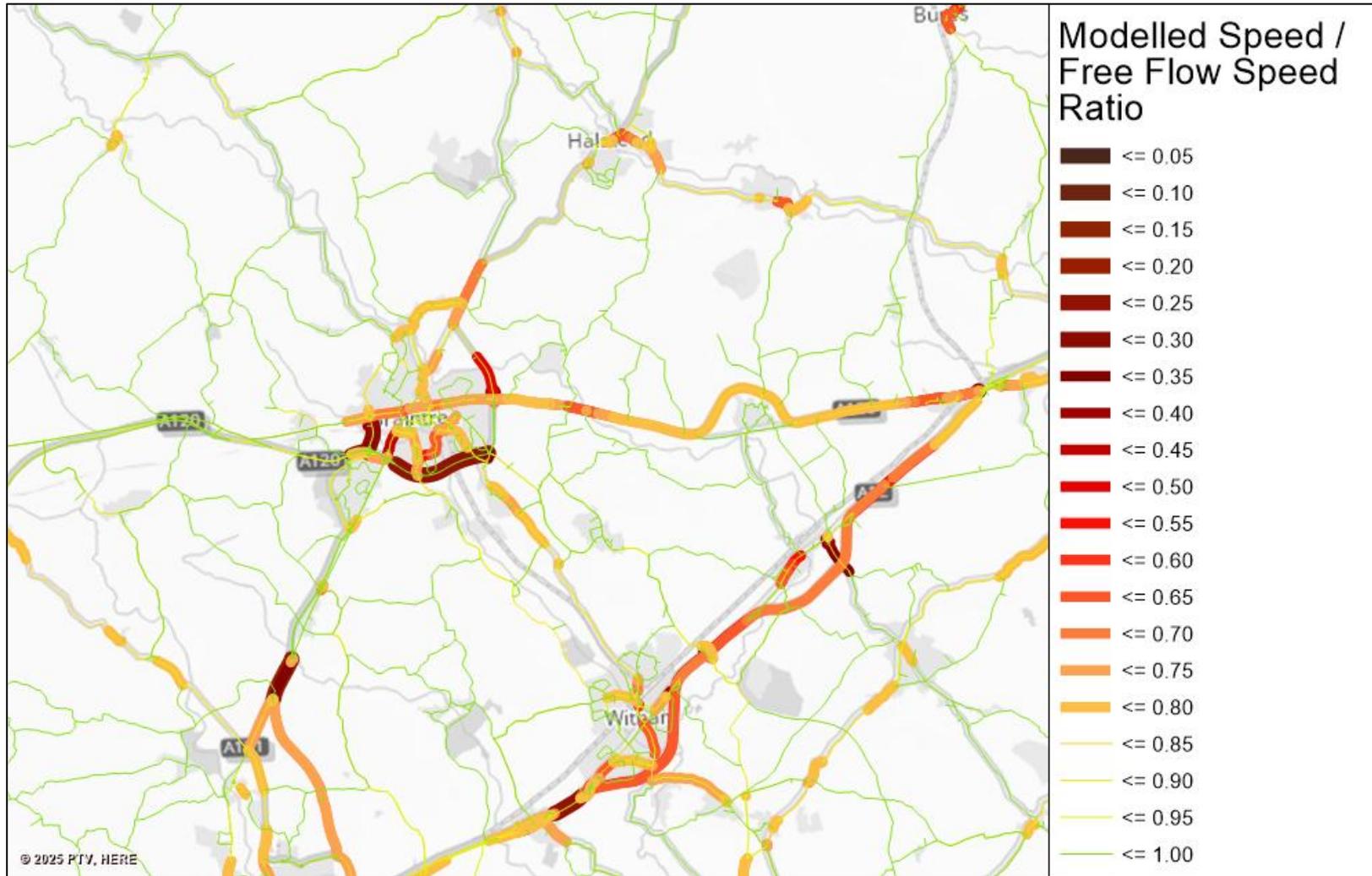**Figure C- 2: Speed Ratio - Assessment Case – AM**
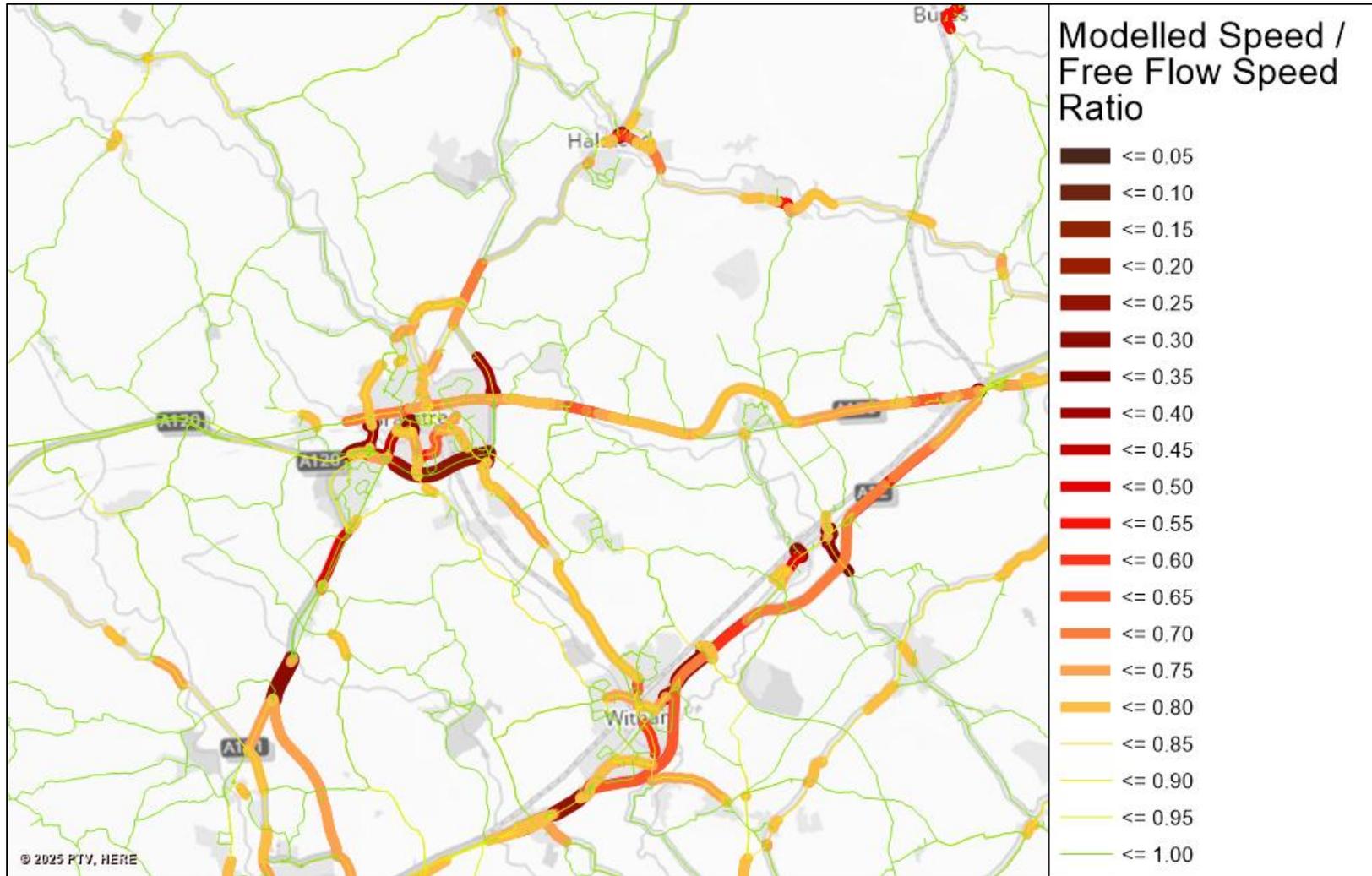
Figure C- 3: Speed Ratio - Reference Case – PM

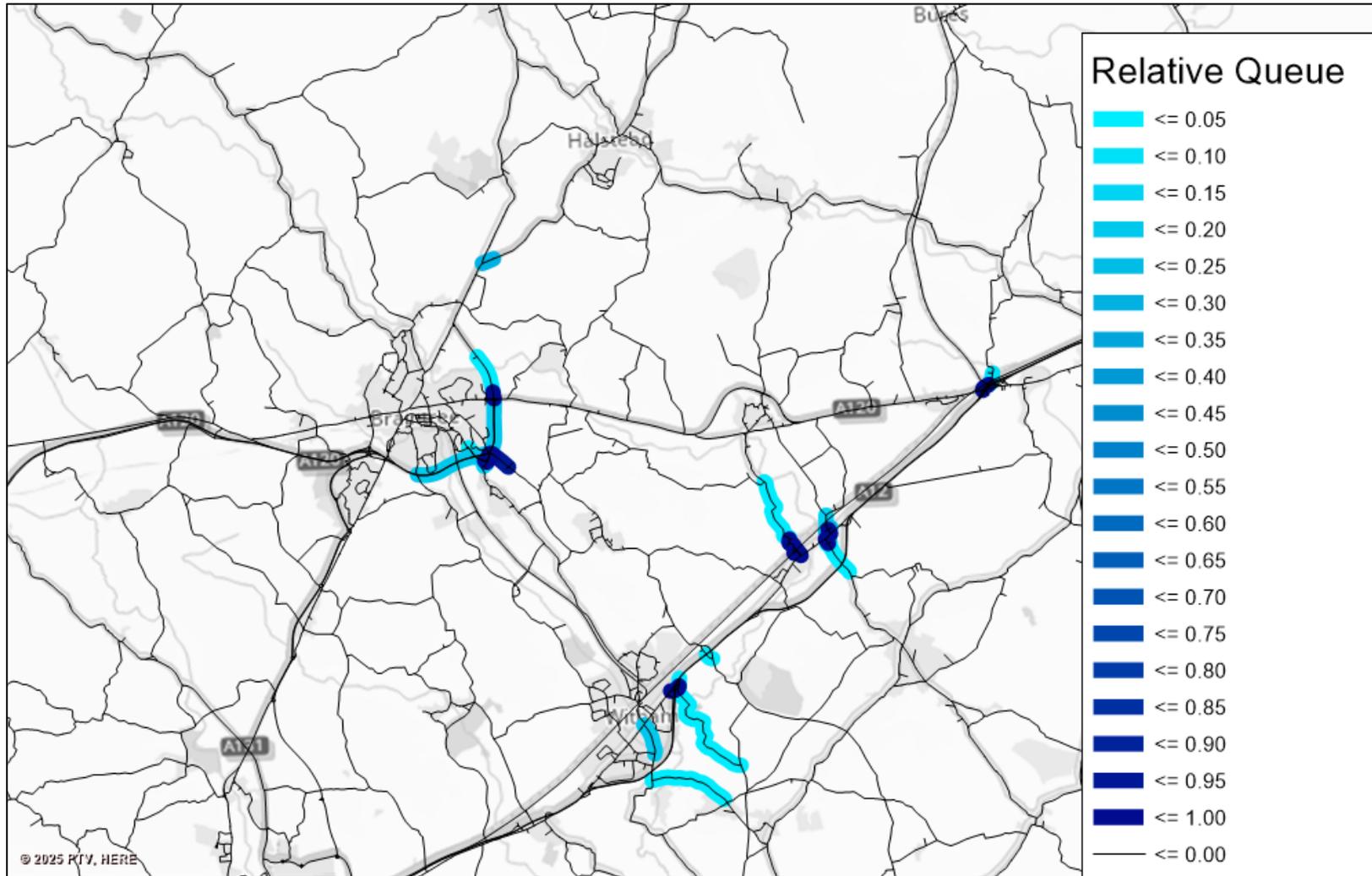**Figure C- 4: Speed Ratio - Assessment Case – PM**

Appendix D. Absolute Queue Plots
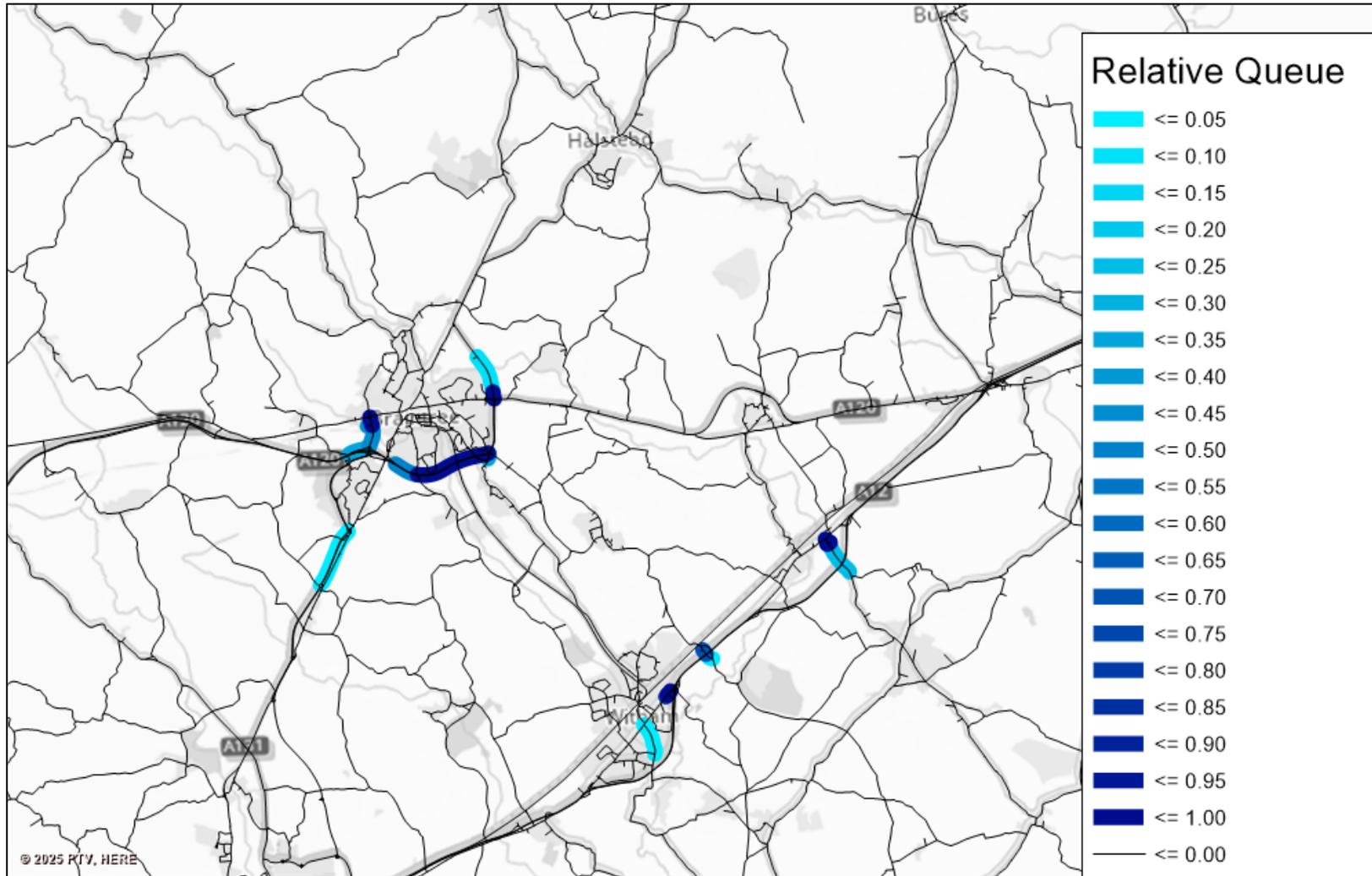
Figure D- 1: Relative Queue – Reference Case – AM

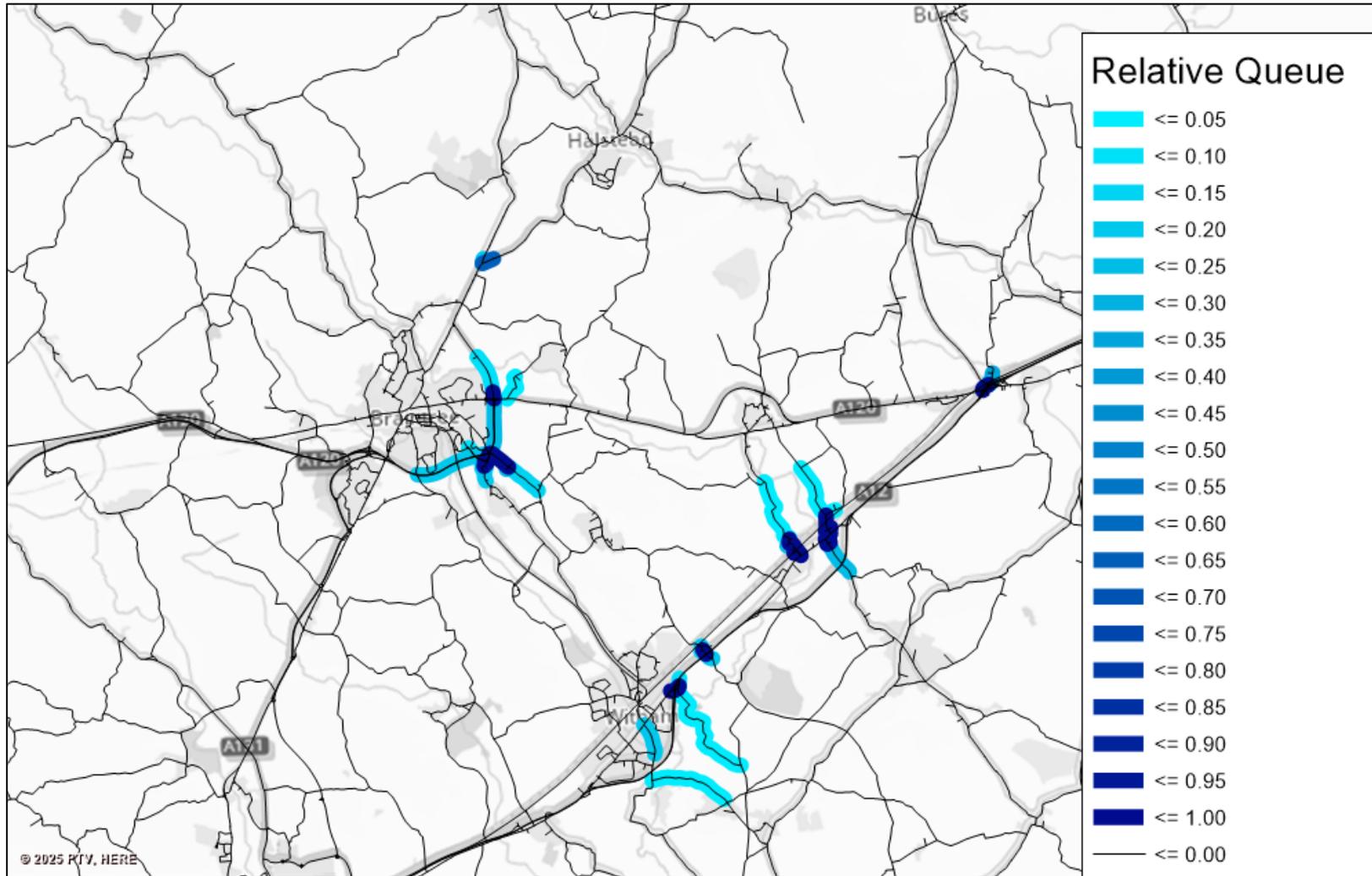**Figure D- 2: Relative Queue – Reference Case – PM**
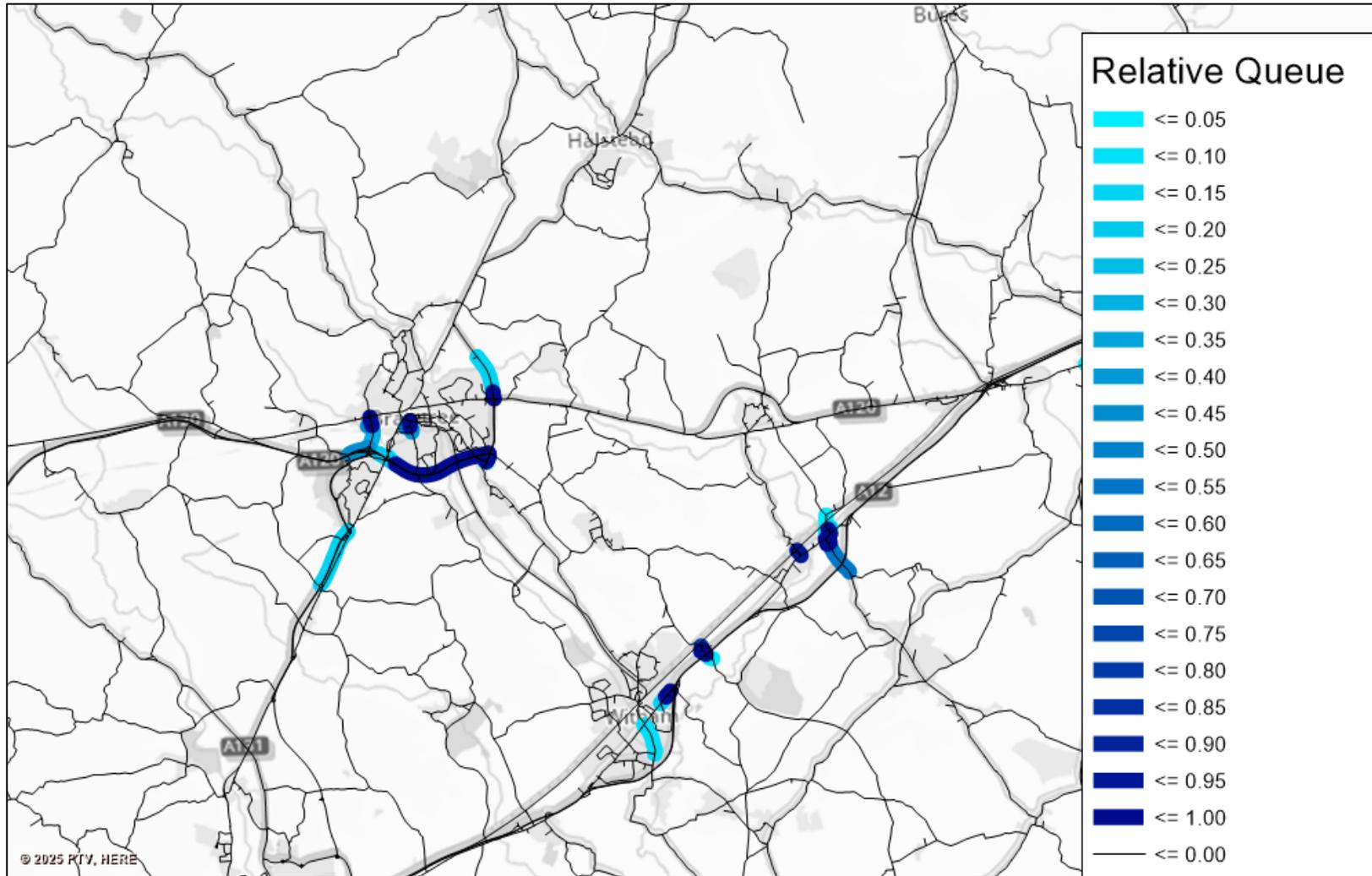
Figure D- 3: Relative Queue – Assessment Case – AM

Figure D- 4: Relative Queue – Assessment Case – PM