A12 Chelmsford to A120 widening scheme

TRAFFIC MODELLING REPORT FOR CONSULTATION

Statutory Consultation 2021

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1 Executive summary

This report describes the development of traffic models that have been used to assess the impact of the proposed A12 Chelmsford to A120 widening scheme. It also summarises key results from the traffic models.

Traffic models were initially developed to represent the existing conditions of the strategic and local road network in north Essex. These models show the amount of traffic on each road in the model area, and the speeds at which vehicles typically travel. The traffic models were produced using information on people's travel patterns obtained by analysing records of mobile phone movements. The models also use information from traffic counts and demographic data on where people live and work.

Based on this information, traffic models were then produced to predict how traffic conditions may change in the future, both with and without the proposed scheme in place. By comparing different traffic model scenarios, the likely impact of the proposed scheme can be better understood.

The predicted impact of the proposed scheme is presented in this report. It shows that:

- Journey times on the A12 would continue to worsen in the future if the proposed scheme is not built.
- The proposed scheme would offer journey time savings of up to 11 minutes during rush hour between A12 junctions 19 and 25, compared to a scenario where the scheme is not built.
- Sections of the existing A12 which would be bypassed as part of the scheme would experience significant reductions in traffic.
- Some local roads would experience decreases in traffic, either because the A12 becomes a more attractive option, or because the scheme provides more direct access onto the A12 without travelling through local villages.
- A small number of local roads would experience increases in traffic, especially those which would be used to access newly improved A12 junctions.

The predicted environmental impacts due to these changes in traffic (for example on noise and air quality) are described in the Preliminary Environmental Information Report provided as part of this consultation.

2 Introduction

2.1 Purpose of this report

2.1.1 This Traffic Modelling Report for Consultation gives an overview of the work carried out by Highways England to assess the need for, and impact of, the A12 Chelmsford to A120 widening scheme. It presents the key findings of the differences in the performance of the road network in the future if the proposed scheme is built or not.

2.1.2 We have assessed the need for additional road capacity on this section of the A12, and the impact that widening the road would have, by developing a simulation of the transport system in the north Essex area. This is referred to in this report as the 'traffic model'.

2.1.3 The traffic model shows the number of people travelling by road and the routes they use now, and the routes they are forecast to use in future. This enables us to predict how many vehicles will be using each part of the road network in the future and how long it would take to complete a journey. This helps to inform the design of the proposed scheme and to predict its environmental impacts. This report describes how we developed the traffic model and summarises its key findings.

2.2 Consultation

2.2.1 The proposed A12 Chelmsford to A120 widening scheme is a critical part of investment in the east region, as this key road plays an important role at a strategic, regional and local level. The proposed scheme is categorised as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. As such, we are required to make an application for a Development Consent Order (DCO) to obtain consent to construct the proposed scheme. For more information on this process, please visit the Planning Inspectorate website https://infrastructure.planninginspectorate.gov.uk/application-process/

2.2.2 We are currently in statutory consultation where we present our proposals and then consider and have regard to your feedback. This report forms part of a suite of documents that are published as part of the statutory consultation.

2.3 Scheme description

Scheme overview

2.3.1 During our first consultation in 2017, four options for the scheme were presented. Our preferred route is based on route 2. Our proposals widen the existing A12 between junctions 19 and 25 to three lanes in each direction (where it is not already) and create a three-lane bypass in each direction at Rivenhall End. This route reflects the feedback we received on junctions in our first consultation, as well as comments about the Rivenhall End bypass being close to the Rivenhall Long Mortuary Enclosure scheduled monument. The proposals also include constructing a bypass between junctions 24 and 25. Our proposed scheme will cover all the work necessary to construct the proposed new road layout.

2.3.2 The preferred route was selected based on several factors, including environmental impacts, journey times, complexity of build, affordability, feedback from the public and advice given by the Planning Inspectorate on the joint Local Plan for that area. For more information on the previous consultation results and the preferred route announcement, please visit our webpage at www.highwaysengland.co.uk/A12.

Detailed scheme proposals

2.3.3 Our proposals start at junction 19 (Boreham Interchange) where we will improve the junction. As we move north towards Hatfield Peverel, it is already three lanes in each direction, so our changes will be focused on improving signs, overhead gantries, and lighting.

2.3.4 We will widen the road to three lanes at Hatfield Peverel. The current junctions 20a and 20b will be closed and replaced by a new junction 21. Our new junction 21 will provide access to the A12 both northbound and southbound, and will take traffic from all directions between Hatfield Peverel village and Witham.

2.3.5 As we move north, the widening will continue along the current A12. Our new junction 22 will provide access to the A12 both northbound and southbound. It will take traffic from Rivenhall End, Kelvedon, Witham and Little Braxted onto the A12 but will be built just to the east of its current location. After the new junction 22, the new bypass with three lanes in each direction will begin. It will run to the south of Rivenhall End. After Rivenhall End, the bypass will re-join the existing A12.

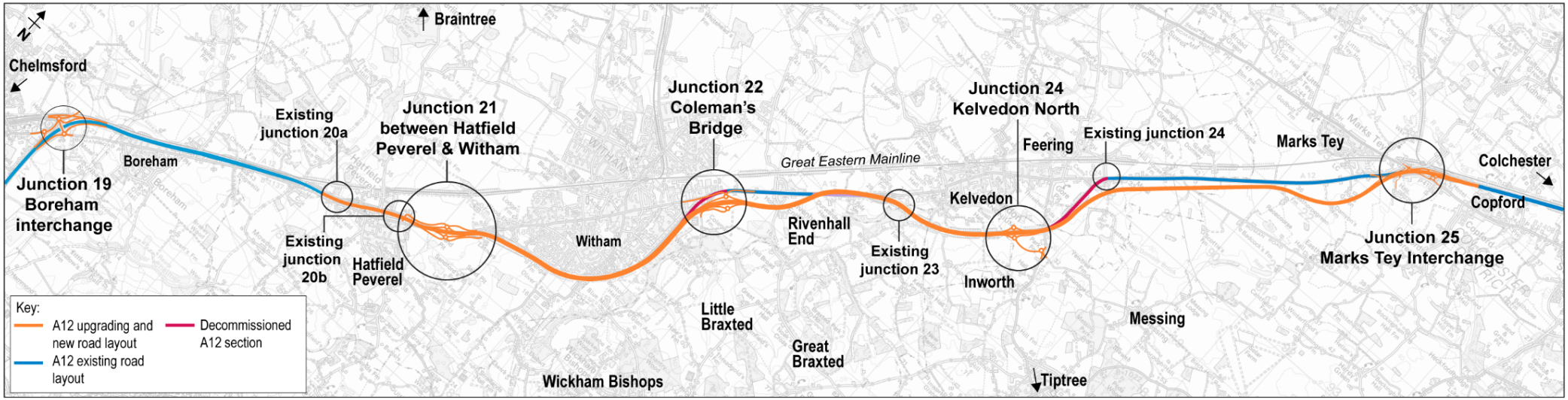
2.3.6 The current junction 23 will be removed but we will provide a new road from Kelvedon to the existing A12 for journeys between Rivenhall End and Kelvedon. A new safer access road to the Essex County Fire and Rescue Service Headquarters will also be provided. We are aware of the potential impacts the proposed A120 project may have on this junction.

2.3.7 The proposed scheme will also be upgraded to a three-lane road in each direction south of Kelvedon. Just prior to the road passing over Inworth Road (B1023), we will create a new junction 24 (Kelvedon North) which will provide access to the A12 both northbound and southbound. It will take traffic from Kelvedon, Inworth and Tiptree onto the A12.

2.3.8 After our new junction 24, a second three-lane bypass will take traffic to and from Marks Tey. It will be located just to the south of the current A12. Just prior to the existing junction 25 (Marks Tey Interchange), the new bypass will re-join the current A12. A new upgraded junction 25 will provide access to the A12 both northbound and southbound. It will take traffic from Marks Tey, Copford and the A120, and provide a connection to the existing A12 which will be kept for use by local traffic.

2.3.9 A map of the proposed scheme is provided in Plate 2.1. For further details, including information on each of our proposed junctions, see the Public Consultation Brochure.

Plate 2.1 Proposed Scheme Map



3 How we modelled current conditions

3.1.1 This chapter sets out how we developed our traffic model to reflect current conditions.

3.1.2 The traffic model was created to represent the transport system in this area of north Essex on a typical weekday. The model covers the whole of the UK to capture the actual start and end of every trip, but is more detailed in the areas around Chelmsford, Braintree, Colchester, Maldon and the towns and villages in between.

3.1.3 The hours modelled in the traffic model are from 07:00–08:00 in the morning (the morning peak) and 17:00–18:00 in the evening (the evening peak) as these are the busiest times of day on the A12 in this area, confirmed by using traffic count data. A typical hour in the middle of the day is also modelled (the inter-peak).

3.1.4 Details of the current transport network were taken from digital maps and from other recent transport models of the area. The road network within north Essex is represented in detail, for example it includes the amount of red and green time at traffic signals and the number of lanes along each stretch of road and at junctions. The areas outside of north Essex are slightly sparser, however they allow for long-distance movements on the strategic road network (SRN). The SRN is the network of roads that fall under the responsibility of Highways England, and are generally motorways and strategic A Roads.

3.1.5 The information on where people are travelling to and from has been taken from analysis of the movement of a vast number of mobile phones in the UK. The mobile phone data are completely anonymous but provide details of the travel patterns of millions of mobile phones around the country. This information is scaled to match traffic counts in the area and then merged with other data sources to provide the travel patterns of cars, vans and Heavy Goods Vehicles (HGVs) across the country.

3.1.6 The traffic model is then used to predict on which routes vehicles will travel, considering:

- where people want to travel to and where they are coming from
- people's preference between journey time and journey distance
- the actual speeds of vehicles on the road network

3.1.7 The amount of traffic predicted by the model using the road network is compared to actual counts (where available) of the number of vehicles on the road network, collected from traffic counters laid out on the road or specially commissioned video surveys. The times that journeys are predicted to take are compared with observations from in-vehicle satellite navigation devices which provide actual travel times, recorded during the modelled hours. This process is known as model calibration and validation.

3.1.8 The Department for Transport (DfT) has issued guidelines on how traffic models such as this should be built, and the extent to which the predictions of traffic flows and times made by the model compare with real life. These guidelines are

called Transport Analysis Guidance (TAG) and are used in the assessment of transport schemes across the country.

4 How we predict future traffic conditions

4.1 Overview

4.1.1 To understand the impact of the proposed scheme when it opens, we firstly need to understand how the background traffic conditions will change in the future. This section of the report describes how we use our traffic model to make these future traffic predictions.

4.2 Different model scenarios: with and without the scheme

4.2.1 We have produced traffic models to predict traffic conditions for two different scenarios:

- A future scenario where the proposed scheme is *not* built. This is referred to as the Do Minimum (DM) scenario.
- A future scenario where the proposed scheme *is* built. This is referred to as the Do Something (DS) scenario.

4.2.2 The remainder of this chapter describes how the Do Minimum scenario was modelled. It discusses how traffic levels are predicted to change in the future, including how new housing and employment developments are expected affect this.

4.2.3 A description of how we modelled the Do Something scenario to predict the impact of the proposed scheme is provided in Chapter 5.

4.3 Which years have been modelled

4.3.1 The previous chapter described how we modelled traffic conditions as they were in 2016. Building on this, we have also predicted future traffic conditions in the following three years:

- 2027, when the proposed scheme is expected to open
- 2042, which is fifteen years after opening
- 2051, which is the final year for which DfT has published traffic growth forecasts from its National Transport Model

4.4 Predicting the growth in traffic

4.4.1 The overall level of growth in car trips from 2016 to the three future year scenarios is taken from the most recent DfT National Trip End Model forecasts, published in March 2017.

4.4.2 These forecasts are based on estimates from the Office for National Statistics (ONS) on the number of people living in each area. The number of car trips made per person varies according to factors such as age, employment status, car ownership and household size. This is then applied to the number of people forecast in the future for these categories. This produces a forecast of the future number of car trips.

4.4.3 The growth in the number of trips made by vans and HGVs is taken from DfT Road Traffic Forecasts, last published in 2018 (RTF18).

4.5 Taking account of local developments

4.5.1 Adjustments to the location of future car trips are also made by including certain planned housing developments, and other developments such as employment, retail and leisure sites. A list of these developments was produced through discussions with local planning authorities in Braintree, Chelmsford, Colchester, Maldon and Tendring, and can be found in Appendix A.

4.5.2 For the main traffic forecasts used to inform the highway design and economic and environmental appraisals, known as the 'core scenario', only developments with planning permission (or for which planning applications have either been submitted or are expected to be submitted imminently) are specifically included in the traffic model, in accordance with TAG (unit M4, table A1). In addition, only developments over a certain size threshold are specifically included in the traffic model (because, for example, a development with 250 houses will have more of an impact on the road network than a single house extension or single storey development).

4.5.3 Any developments which are not specifically modelled are instead accounted for by general background traffic applied at a local authority level. In order to ensure that there is not too much traffic created on the network, the overall level of growth has been constrained to total local authority growth estimates from ONS data.

4.5.4 Maps of the specific local developments included within the traffic model (i.e. large sites with planning permission or planning applications) are shown below. Plate 4.1 and Plate 4.2 show housing sites with greater than 450 dwellings, labelled with the total amount of dwellings at each site. Plate 4.3 shows the employment site locations.

Plate 4.1 Large housing sites included in traffic model (annotated with number of dwellings) – Part 1

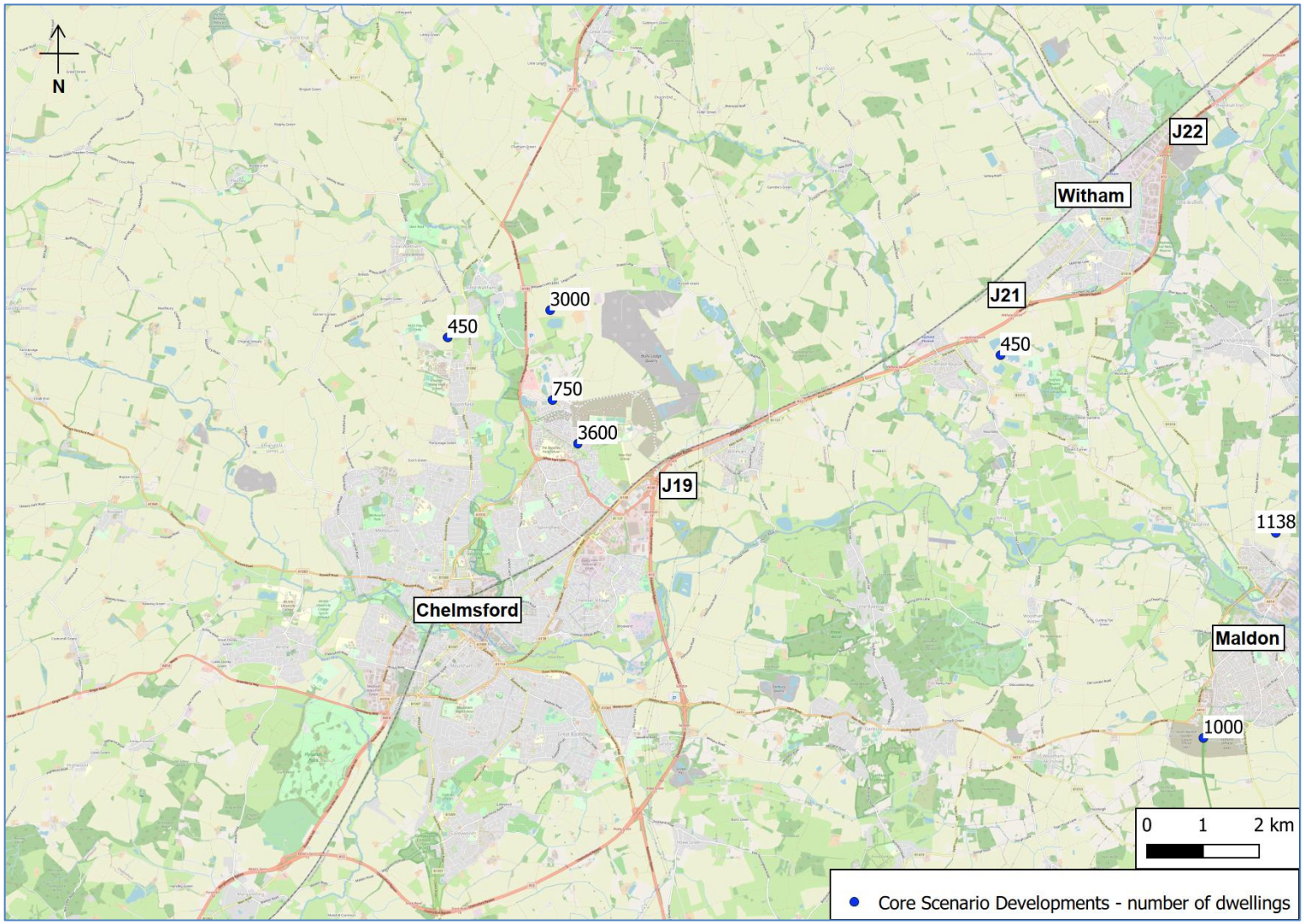


Plate 4.2 Large housing sites included in traffic model (annotated with number of dwellings) – Part 2

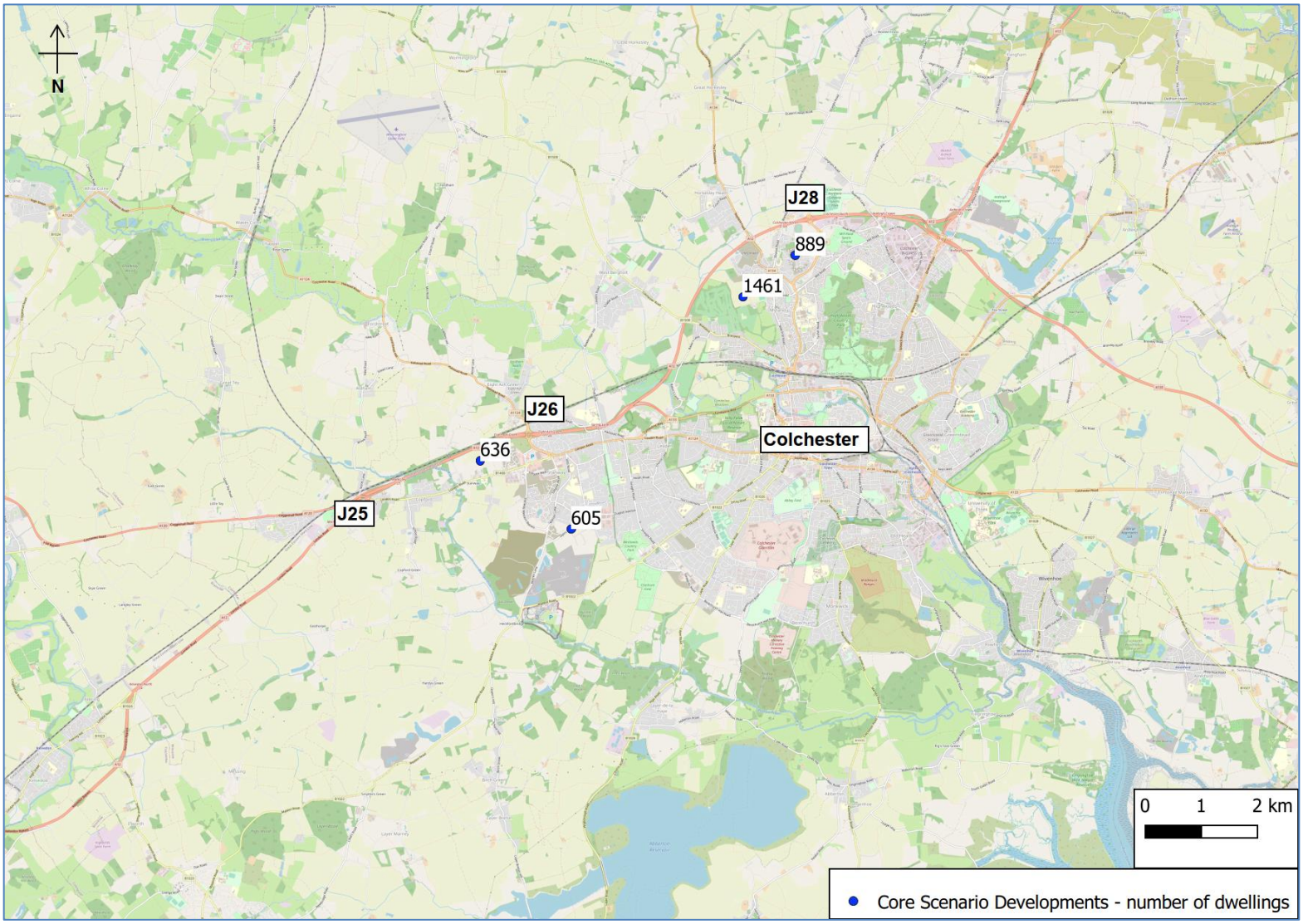
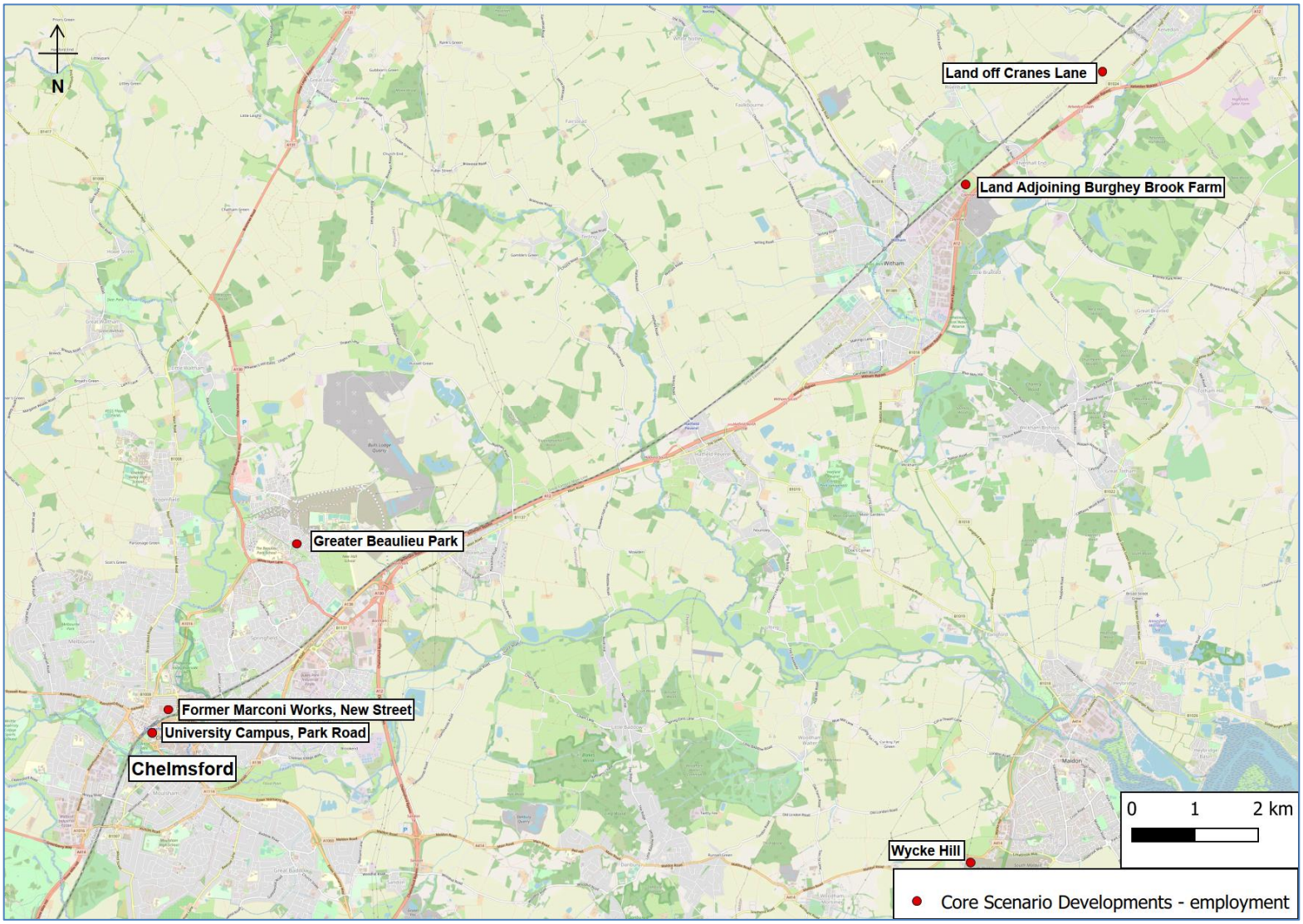


Plate 4.3 Large employment sites included in traffic model



4.6 Taking account of future changes in the road network

4.6.1 The road network in the transport model has also been updated to include road schemes that are likely to be built, regardless of whether the proposed A12 Chelmsford to A120 widening scheme is built or not. This information has been provided by Highways England and by local authorities in the area, and the list of road schemes included is shown in Table 4.1. For the purposes of our models, we have assumed that each of these schemes will be open by 2027. Road schemes which are considered not certain enough (for example the proposed A120 Braintree to A12 improvement scheme) have been excluded. Road schemes which are considered too far away to affect the A12 scheme have also been excluded. For example, the proposed Lower Thames Crossing (LTC) has been excluded as the A12 is unlikely to carry significant volumes of traffic that is expected to use the LTC.

Table 4.1 Future transport schemes included in the traffic model

Scheme name	Scheme overview
Stanway Western Bypass towards A12 Junction 26	Improvements to link and junction at Junction 26
A1060/A1114 Army and Navy Junction Improvements	New signalisation of the Army and Navy junction, flyover removal
A131 Chelmsford to Braintree Route Improvements	Improvements to junctions along A131 between Chelmsford and Braintree
Chelmsford North East Bypass Phase 1	New highway link between Beaulieu Park and A131 at Chatham Green
Beaulieu Rail Station	Road infrastructure related to new rail station
B1053 Deanery Hill, Braintree	Junction improvement to access new development site
Feering Hill, Kelvedon	Improvements to B1024 / Swan Street junction
South Maldon Garden Suburb relief road	New Relief Road in south Maldon
North Heybridge Garden Suburb relief road	New Relief Road in north Maldon
Beaulieu Park, Radial Distributor Road 1	New Relief Road between Channels Drive, Beaulieu Park and Chelmsford North East Bypass
Beaulieu Park, Radial Distributor Road 2	Link road between Chelmsford North East Bypass and the northern access to the 3,000-home development in north-east Chelmsford
Boreham interchange improvement (Section 106 scheme)	Improvement at A12 junction 19, part of Section 106 agreement for Beaulieu Park housing development
A134 Colne Bank Roundabout, Colchester	Junction Improvement
Millennium Way Slips (A120)	New slip roads from Millennium Way onto A120

4.7 How we treat the impact of Covid-19

4.7.1 The proposed scheme is not expected to open until 2027, and the likely long-term impacts of Covid-19 on travel demand are not yet understood.

4.7.2 The core traffic modelling scenario reported in this Traffic Modelling Report for Consultation is based on DfT traffic growth predictions which pre-date the Covid-19 pandemic.

4.7.3 However, sensitivity tests are being undertaken to understand the impact that higher or lower future traffic growth could have on the proposed scheme. As more is understood about the long-term impacts of Covid-19 on travel demand, it is likely that additional traffic modelling will be produced to reflect this.

5 How we predict the impact of the proposed scheme

5.1.1 The chapter above described how we modelled the Do Minimum scenario, i.e. what future traffic conditions are predicted to be if we do not build the proposed scheme.

5.1.2 This chapter sets out how we modelled the Do Something (DS) scenario, that predicts the impact on the A12 and other parts of the road network if the proposed scheme is built.

5.1.3 The model is used to predict changes in the time and cost of journeys if the proposed scheme is built, compared to the Do Minimum scenario. This includes traffic which does not use the A12 improvements itself but whose journey times are affected by changes in traffic patterns as a result of the scheme. This could mean trips on minor roads having a faster journey time, due to less congestion from traffic that has now switched to the newly improved A12 road.

5.1.4 The model also predicts how people will react to these changes in the time and cost of their journeys. The possible changes include how often they make the same trip, a change in the time of day they travel, a switch to or from public transport, where they travel to and from or what route they choose to take.

5.1.5 Evidence suggests that, generally, the same people will continue to travel by car but they may change where they travel to. As traffic speeds fall, or trips become more expensive, people tend to respond by making shorter journeys and where journeys become quicker or cheaper, some people choose to travel to places further away, for example, they choose employment further away from home.

5.1.6 The traffic model shows how many vehicles are expected to use each part of the road network, and the speeds they travel at. This information is then used to predict the environmental impacts of traffic (for example on noise and air quality). It is also used to measure the performance of the road network and to provide details on the location and level of congestion, the likelihood of accidents and changes in journey time reliability (not the length of journey time, but the consistency of the journey time remaining the same from day to day).

6 What the model predicts

6.1 Worsening congestion over time if nothing is done

6.1.1 The A12 is already operating close to its theoretical operational capacity in some sections, causing congestion and delay for road users. The traffic model predicts that as flows continue to increase over time, this situation will worsen if nothing is done.

6.1.2 Plate 6.1, Plate 6.2, Plate 6.3 and Plate 6.4 show how the level of traffic in the morning and evening peak hours compares to the road's theoretical capacity. This is shown for the current situation (2016) and as predicted in 2042. It shows that by 2042, even more sections of the A12 would be operating beyond the capacity they were designed for if the proposed scheme is not built. This would lead to journeys becoming even slower and more unreliable.

Plate 6.1 Current congestion (AM peak)

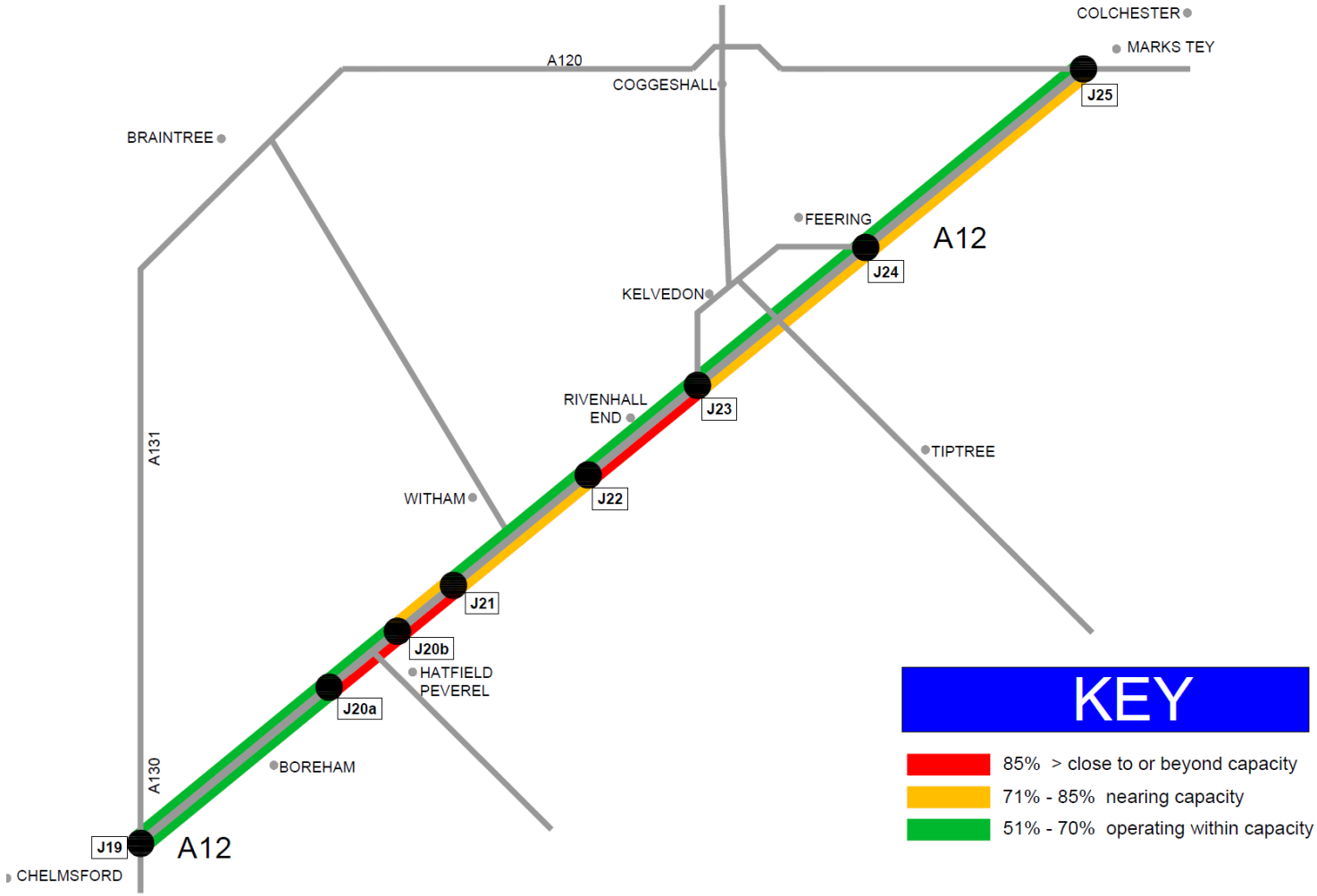


Plate 6.2 Current congestion (PM peak)

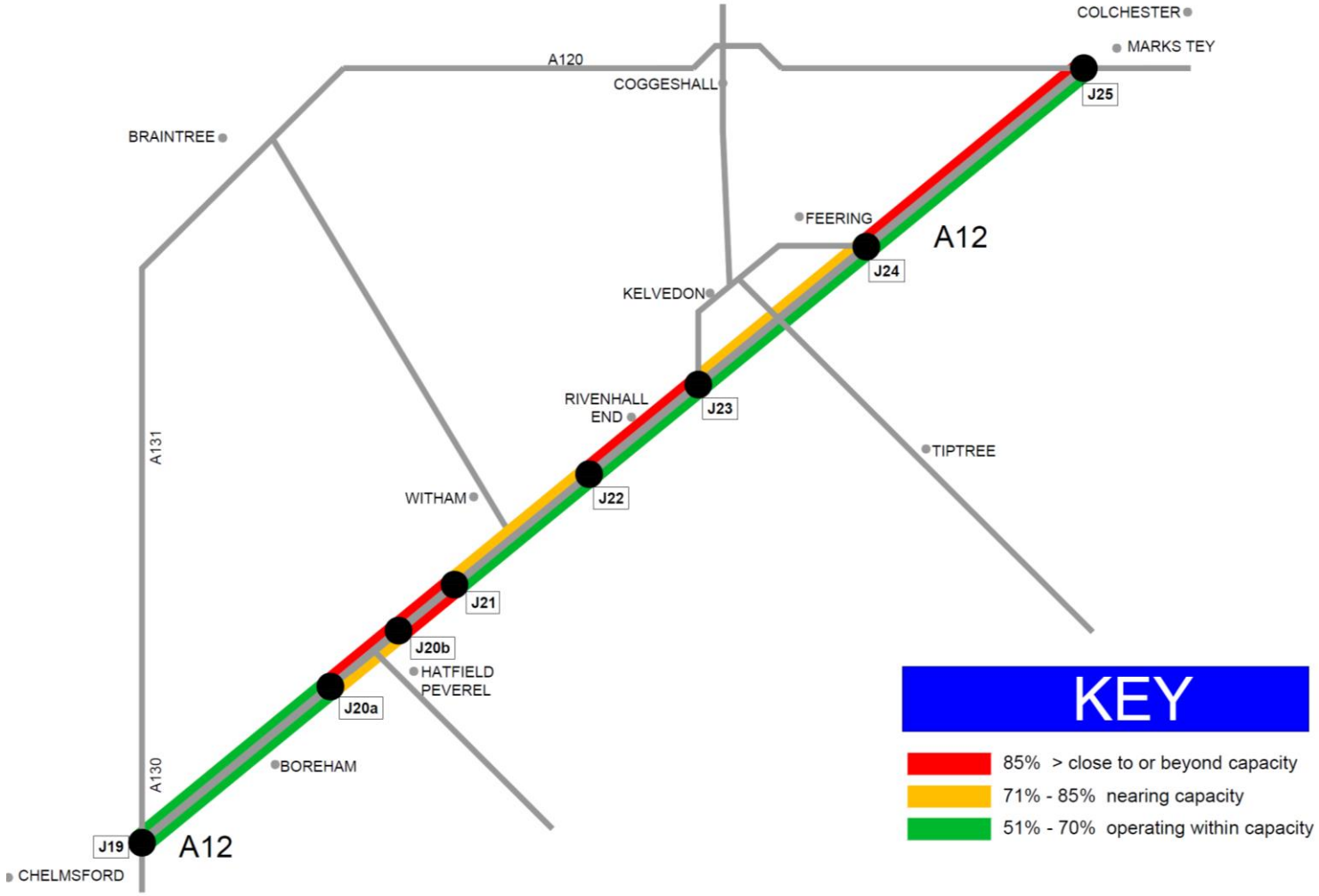


Plate 6.3 Predicted congestion by 2042 without the scheme (AM peak)

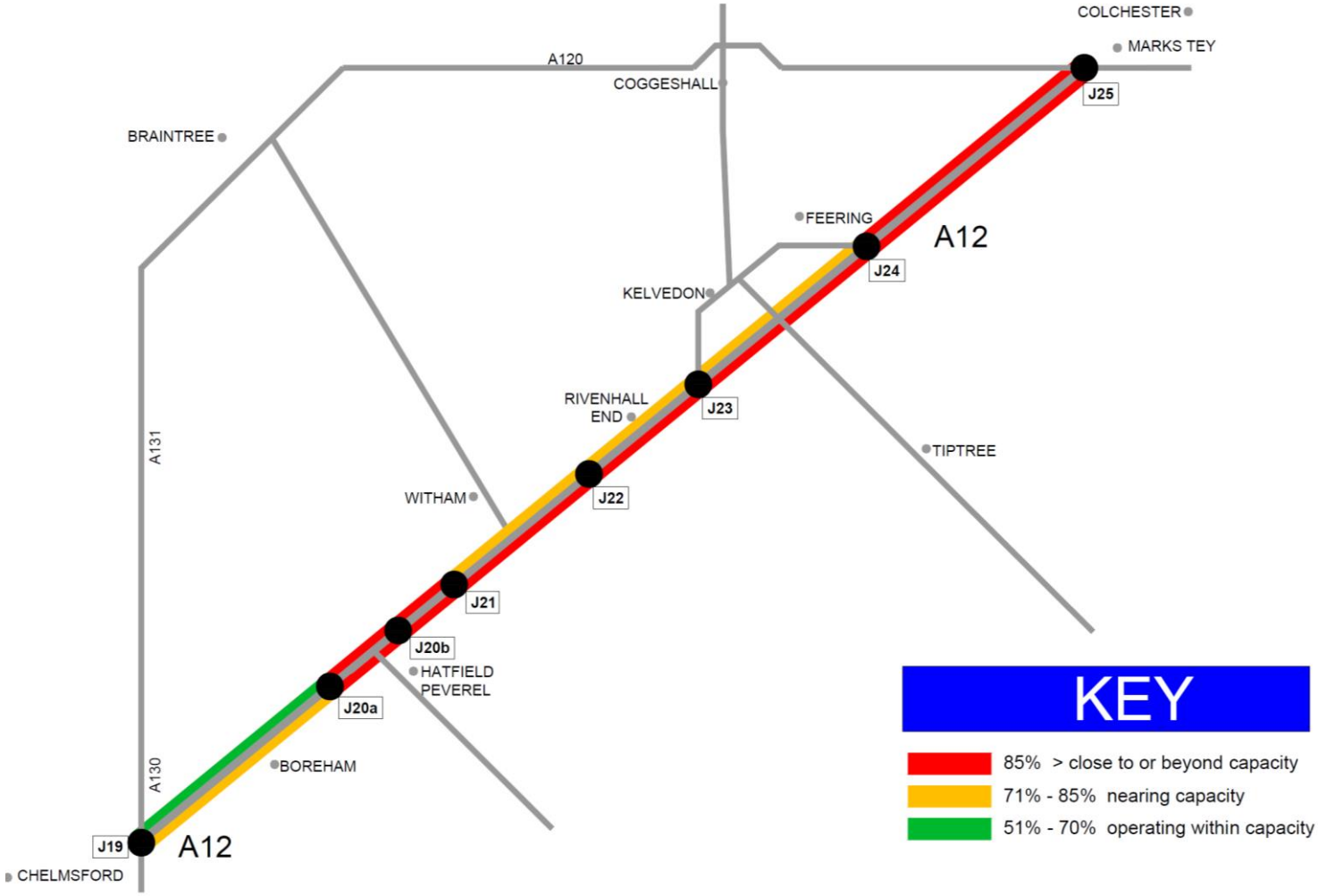
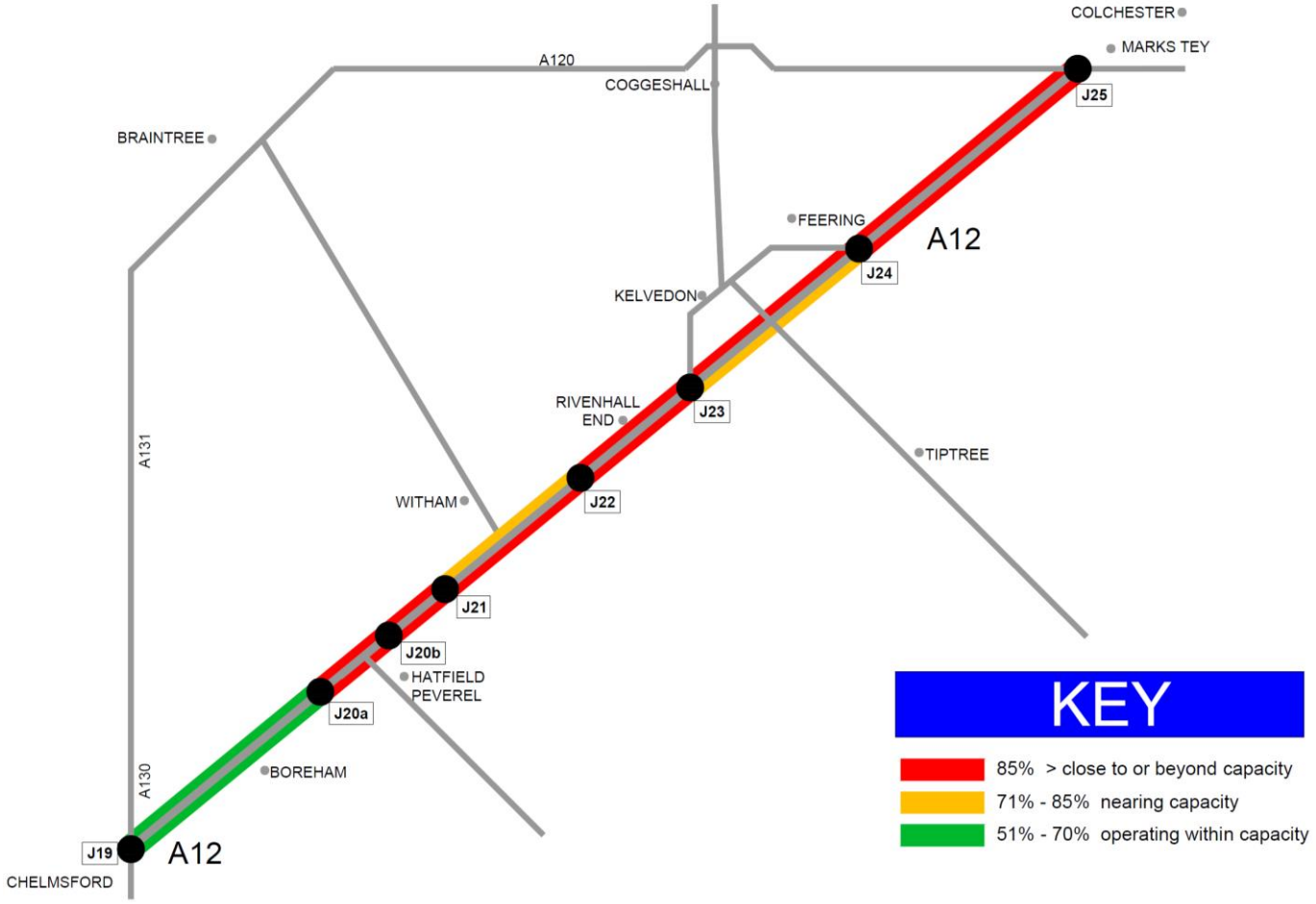


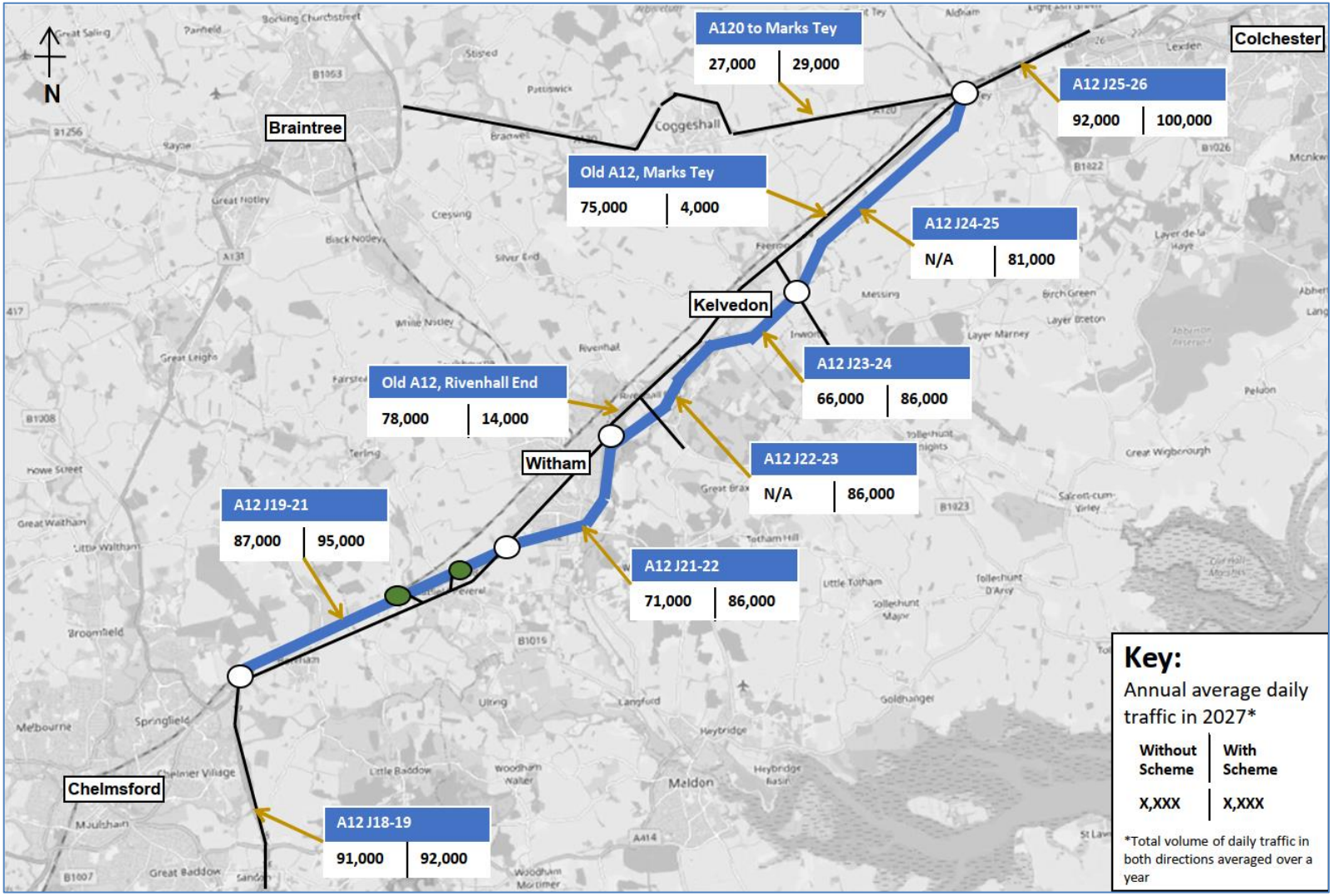
Plate 6.4 Predicted congestion by 2042 without the scheme (PM peak)



6.2 Change in flow on strategic roads

6.2.1 Plate 6.5 shows the predicted traffic flows on key roads in the Strategic Road Network, both with and without the proposed scheme in place. Traffic numbers are presented as a total volume of daily traffic in both directions, averaged over a year. Traffic numbers are presented for 2027 (the expected year of scheme opening).

Plate 6.5 Strategic network Average Annual Daily Traffic (AADT) – 2027



6.2.2 The image highlights that:

- traffic would reduce significantly on the two sections of the existing A12 that are bypassed as part of the proposed scheme (Rivenhall End and between junctions 24 and 25).
- traffic levels would increase on the A12 between junctions 19 and 25, as well as on the sections of the A12 on either side of the scheme. Because the A12 would see such an improvement in journey times and reliability, traffic would re-route onto the A12 away from other less suitable routes. People are also predicted to make more trips along the A12 corridor in general if the road is improved.

6.3 Change in flow on local roads

6.3.1 The local road network is defined as that owned by local authorities or private landowners, and is generally made up of the smaller roads that carry less traffic than the SRN. Table 6.1, Table 6.2 and Table 6.3 show the predicted traffic volumes in the Do Minimum and Do Something scenarios (without and with the proposed scheme), and the percentage change. This is shown for key local roads which could potentially be affected by the proposed scheme. Traffic volumes are presented for the weekday AM and PM peak hour summed over both directions, as well as the total 24hr daily traffic averaged over a year. The data is presented for the proposed scheme opening year of 2027.

6.3.2 Further information on some of these traffic changes are provided below the tables.

6.3.3 Maps of these locations are provided in Appendix B.

6.3.4 Traffic flow changes predicted in 2042 are provided in Appendix C.

Table 6.1 Local road Average Annual Traffic (AM peak hour) – 2027

Local road name	Without scheme	With scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	524	697	33%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	1,307	986	-25%
Station Road, Hatfield Peverel	423	428	1%
Maldon Road Hatfield Peverel	984	1,005	2%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	1,573	1,368	-13%
Little Braxted Lane	180	249	38%
B1389 Colchester Road, Witham	884	1,185	34%
Braxted Park Road, Great Braxted	693	598	-14%
Henry Dixon Road, Rivenhall End	777	900	16%
Oak Road, Rivenhall End, north of A12	711	264	-63%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	99	136	37%
B1024 London Road, west of Kelvedon	765	458	-40%
B1024 Kelvedon High Street	1,030	767	-26%
B1023 Inworth Road, Inworth	729	1,403	92%
B1023 Inworth Road, north of A12	745	851	14%
London Road between Gore Pit Lane and existing J24	656	443	-33%
Easthorpe Road	40	48	18%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	672	719	7%

Table 6.2 Local road Average Annual Traffic (PM peak hour) – 2027

Local road name	Without scheme	With scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	510	503	-1%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	1,291	917	-29%
Station Road, Hatfield Peverel	421	389	-8%
Maldon Road Hatfield Peverel	1,079	1,093	1%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	1,655	1,712	3%
Little Braxted Lane	134	370	176%
B1389 Colchester Road, Witham	958	1,209	26%
Braxted Park Road, Great Braxted	579	610	5%
Henry Dixon Road, Rivenhall End	817	977	20%
Oak Road, Rivenhall End, north of A12	754	224	-70%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	117	186	59%
B1024 London Road, west of Kelvedon	696	439	-37%
B1024 Kelvedon High Street	997	831	-17%
B1023 Inworth Road, Inworth	862	1,358	57%
B1023 Inworth Road, north of A12	881	785	-11%
London Road between Gore Pit Lane and existing J24	729	476	-35%
Easthorpe Road	27	47	74%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	845	922	9%

Table 6.3 Local road Average Annual Daily Traffic (total 24hr traffic) – 2027

Local road name	Without scheme	With scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	5,870	7,320	25%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	15,770	10,360	-35%
Station Road, Hatfield Peverel	4,230	4,240	0%
Maldon Road Hatfield Peverel	12,940	12,720	0%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	19,540	17,960	-10%
Little Braxted Lane	1,200	3,480	190%
B1389 Colchester Road, Witham	10,930	13,850	25%
Braxted Park Road, Great Braxted	7,410	6,390	-15%
Henry Dixon Road, Rivenhall End	9,580	10,040	5%
Oak Road, Rivenhall End, north of A12	9,050	2,650	-70%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	1,110	1,900	70%
B1024 London Road, west of Kelvedon	9,070	5,330	-40%
B1024 Kelvedon High Street	11,760	8,970	-25%
B1023 Inworth Road, Inworth	10,680	16,620	55%
B1023 Inworth Road, north of A12	10,950	9,430	-15%
London Road between Gore Pit Lane and existing J24	8,730	4,930	-45%
Easthorpe Road	360	450	25%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	9,570	10,080	5%

6.3.5 The tables above show that some local roads are predicted to experience significant reductions in traffic as a result of the proposed scheme.

6.3.6 Other roads, particularly those which connect to new junctions, would experience an increase in traffic. However, most of these increases would not affect the day-to-day performance of the road in terms of congestion or traffic speeds, and traffic levels would remain well within the capacity that the roads are designed for. The environmental impacts of traffic flow changes, for example on noise and air quality, are reported in the Preliminary Environmental Information Report published as part of this consultation.

6.3.7 A summary of the traffic impacts in several key locations is provided below.

B1137 Main Road, Boreham

6.3.8 Following the closure of the junction 20a access onto the A12 towards Chelmsford, most traffic which previously used this access would instead join the A12 at the new junction 21. However, some traffic is predicted to travel instead along Main Road and use A12 junction 19. This would result in an increase in traffic on Main Road through Boreham in the AM peak of around 175 vehicles per hour. Although traffic would increase, it would still be within the operational capacity of the road and the day-to-day performance of the road would not be expected to worsen. Traffic in the PM peak is not predicted to change significantly.

The Street, Hatfield Peverel

6.3.9 Junctions 20a and 20b would be closed as part of the scheme. This will mean, for instance, that traffic wanting to go southbound on the A12 from Maldon Road will now be sign-posted to our new junction 21 rather than using The Street and junction 20a.

6.3.10 Due to projected growth in the area, the junction with The Street and Maldon Road may struggle to work adequately in the future. While this is expected to happen with or without the proposed scheme going ahead, our new junction 21 location does change how the traffic moves around the junction. By reducing traffic on The Street, more traffic will now turn right to go to our new junction 21. While at this stage it is not intended to include works to the local road junction within the proposed scheme, we will continue to work with Essex County Council, the local planning authorities and the parish council on possible changes.

Little Braxted Lane

6.3.11 The proposed new junction 22 provides a direct access to Little Braxted Lane and in the future it is expected that traffic will increase on Little Braxted Lane. We have discussed this with local parish councils and Essex County Council and will continue to work collaboratively with them to consider whether interventions are required.

Braxted Park Road

6.3.12 Traffic from Tiptree would be able to access the A12 southbound directly, using the new junction 24 via Inworth road. The existing route to join the A12 at Rivenhall End via Braxted Park Road would therefore see a reduction in traffic.

Braxted Road, Kelvedon

6.3.13 The route from Braxted Park Road into Kelvedon via Braxted Road is predicted to have an increase in traffic. Although the percentage increase in traffic is high, this is due to the very low level of traffic on this road to begin with. The absolute change is small at around 40-70 vehicles per hour in the AM and PM peak, or around one car per minute. It is not expected to affect the day-to-day performance of the road.

B1024 Kelvedon

6.3.14 Traffic on the B1024 near Kelvedon and Gore Pit (London Road, Kelvedon High Street, Feering Hill) is predicted to reduce. Junction 24 would be replaced by a new junction (catering for traffic travelling in all directions) with a direct connection to Inworth Road. This means that traffic from south of the A12 such as Tiptree will no longer need to travel via Kelvedon and Feering to access the A12.

B1023 Inworth Road

6.3.15 Inworth Road north of the A12 would have a reduction in traffic, as traffic from Tiptree would be able to join the A12 directly at the new junction 24 rather than travel via Kelvedon or Feering. The location of our new junction 24 was proposed by several stakeholders and has several benefits. However, the proposals would see an increase in traffic on Inworth Road south of the A12 using this route to access junction 24 from the south. While our assessments indicate that Inworth Road is suitable for the expected increase in traffic, the provisional order limits (land which may need to be acquired) currently include land to allow for potential improvements.

Easthorpe Road

6.3.16 Easthorpe Road would no longer join the A12 directly, as that section of the A12 would be bypassed and retained for use by local traffic. There is predicted to be an increase in traffic on Easthorpe Road. Although the percentage increase in traffic is high, this is due to the very low level of traffic on this road currently. The absolute change is small at around 10-20 vehicles per hour in the AM and PM peaks, which is not expected to affect the day-to-day performance of the road.

6.4 Changes in journey times

6.4.1 The current two-lane dual carriageway already experiences slow and unreliable journeys during the morning and evening peak hours. Given the significant housing and business growth expected in this part of Essex, journey times are predicted to get even worse in the future.

6.4.2 The proposed scheme is predicted to significantly reduce journey times along the A12 between junctions 19 and 25.

6.4.3 Table 6.4 and Table 6.5 show the predicted journey time savings that the proposed scheme would offer in 2027 and 2042, compared to the Do Minimum scenario (i.e. without the proposed scheme).

6.4.4 The biggest time savings are expected in the morning peak towards Chelmsford, and in the PM peak towards Colchester.

6.4.5 Overall, the proposed scheme could save motorists over an hour a week if they travel twice a day along the A12 between junctions 19 and 25.

Table 6.4 Journey time savings – 2027

	Direction	Journey time without scheme	Journey time with scheme	Time saving
AM Peak	Northbound	19m 02s	14m 48s	4m 14s
	Southbound	23m 48s	17m 8s	6m 40s
PM Peak	Northbound	26m 56s	17m 49s	9m 7s
	Southbound	17m 38s	14m 50s	2m 48s

Table 6.5 Journey time savings – 2042

	Direction	Journey time without scheme	Journey time with scheme	Time saving
AM Peak	Northbound	21m 49s	15m 50s	5m 59s
	Southbound	26m 57s	18m 41s	8m 16s
PM Peak	Northbound	30m 53s	19m 26s	11m 27s
	Southbound	20m 34s	15m 59s	4m 36s

7 Summary

7.1 Development of traffic models

7.1.1 Traffic models were initially developed to represent the existing conditions of the strategic and local road network in north Essex. These models show the amount of traffic on each road in the model area, and the speeds at which vehicles typically travel. The traffic models were produced using information on people's travel patterns obtained by analysing records of mobile phone movements. The models also use information from traffic counts and demographic data on where people live and work.

7.1.2 Based on this information, traffic models were then produced to predict how traffic conditions may change in the future, both with and without the proposed scheme in place. By comparing different traffic model scenarios, the likely impact of the proposed scheme can be better understood.

7.2 Summary of predicted scheme impacts

7.2.1 The predicted impact of the proposed scheme is presented in this report. It shows that:

- Journey times on the A12 would continue to worsen in the future if the proposed scheme is not built.
- The proposed scheme would offer journey time savings of up to 11 minutes during rush hour between A12 junctions 19 and 25, compared to a scenario where the scheme is not built.
- Sections of the existing A12 which would be bypassed as part of the scheme would experience significant reductions in traffic.
- Some local roads would experience decreases in traffic, either because the A12 becomes a more attractive option, or because the scheme provides more direct access onto the A12 without travelling through local villages.
- A small number of local roads would experience increases in traffic, especially those which would be used to access newly improved A12 junctions.

7.2.2 Further information on these traffic changes is provided throughout this report. This includes explanations for the changes, and the likely impact that any increases in traffic would have on the day-to-day performance of roads.

7.2.3 The predicted environmental impacts due to these changes in traffic (for example on noise and air quality) are described in the Preliminary Environmental Information Report provided as part of this consultation.

Appendix A Treatment of housing / employment developments in the traffic model

A.1 Residential Developments

Developments - Residential Sites

Model Inclusion	Local Authority	Name	Number of dwellings	% of dwellings built by 2027
Core Scenario	Braintree	Former Arla Dairy Site (Hatfield Grove)	145	100%
Core Scenario	Braintree	Former East of England Strategic Health Authority Offices 8 Collingwood Road	98	100%
Core Scenario	Braintree	Land adjacent to Braintree Road	225	100%
Core Scenario	Braintree	Land at Bakers Lane and London Road	96	100%
Core Scenario	Braintree	Land at Straits Mill, Braintree Straits Mill	1000	100%
Core Scenario	Braintree	Land north east of Inworth Road (Part of Strategic Growth Location Land south of Feering/west of A12)	162	100%
Core Scenario	Braintree	Land north of Colchester Road	300	100%
Core Scenario	Braintree	Land off Western Road	350	100%
Core Scenario	Braintree	Land south of Stonepath Drive	120	100%
Core Scenario	Braintree	Land West of Panfield Lane	825	23%
Core Scenario	Chelmsford	Land north, south and east of Belsteads Farm Lane, Broomfield (Channels)	750	100%
Core Scenario	Chelmsford	Runwell Hospital, Runwell Chase, Runwell	575	100%
Core Scenario	Colchester	Axial Way	88	100%
Core Scenario	Colchester	Chesterwell	1461	100%
Core Scenario	Colchester	Cowdray Centre	262	100%
Core Scenario	Colchester	Garrison	509	100%
Core Scenario	Colchester	Gosbecks Phase 2	144	96%
Core Scenario	Colchester	Land to the North of London Road, Stanway	636	33%
Core Scenario	Colchester	Maltings King Edwards Quay	100	100%
Core Scenario	Colchester	Meadows University	257	100%
Core Scenario	Colchester	Rugby Club (including 260 Extra Care Accomdation)	350	19%
Core Scenario	Colchester	Tiptree Neighbourhood Plan sites with planning applications	150	13%
Core Scenario	Maldon District Council	[South of Limebrook Way, Maldon]eastern parcel = Handley Gardens, Maldon; western parcel = Wycke Place	1000	100%
Core Scenario	Maldon District Council	Completed LDP allocations, Maldon and Heybridge	320	100%
Core Scenario	Maldon District Council	Land At Broad Street Green Road And Langford Road And Maypole Road Great Totham Essex [North of Heybridge]	1138	50%
Core Scenario	Tendring District Council	Finches Park, Frinton on Sea	266	91%
Core Scenario	Tendring District Council	Hamford Park, Walton on the Naze	216	100%
Core Scenario	Tendring District Council	Land West of Low Road, Dovercourt	300	57%
Core Scenario	Tendring District Council	Lawford Green, Lawford	360	57%
Core Scenario	Tendring District Council	Oakwood Park (Phase 1), Clacton on Sea	250	100%
Core Scenario	Tendring District Council	River Reach, Mistley	235	100%
Core Scenario	Tendring District Council	Turpins Farm, Kirby Le Soken	210	86%
Core Scenario	Colchester	Fiddlers Field, Eight Ash Green	150	100%
Core Scenario	Braintree	Sorrells Field Bury Lane ("Mulberry Green")	50	100%
Core Scenario	Colchester	Land adjoining Gables, Kelvedon Road, Tiptree	130	100%
Core Scenario	Colchester	Land off Barbrook Lane, Tiptree	200	100%
Core Scenario	Colchester	Wilkin and Sons Ltd, Factory Hill, Tiptree	126	100%
Core Scenario	Colchester	Land at Maldon Road, Rear of Peakes Close, Tiptree	255	100%
Core Scenario	Colchester	Land at Grange Farm, Tiptree	103	100%
Core Scenario	Tendring District Council	Brook Park West, Clacton on Sea	200	85%

Developments - Residential Sites

Model Inclusion	Local Authority	Name	Number of dwellings	% of dwellings built by 2027
Core Scenario	Chelmsford	Great Leighs - Land East of Main Road	100	100%
Core Scenario	Chelmsford	Land east of Patching Hall Lane, Broomfield	135	100%
Core Scenario	Chelmsford	St Johns Hospital, Wood Street (North), Chelmsford - Linden Homes	127	100%
Core Scenario	Chelmsford	St Johns Hospital, Wood Street (South), Chelmsford - Inland Homes	101	100%
Core Scenario	Chelmsford	Land north of Copperfield Road (East portion) Chelmsford	198	100%
Core Scenario	Braintree	Land between London Road, Pods Brook and A120	215	100%
Core Scenario	Braintree	NE Witham Growth Location, East of Forest Rd	222	100%
Core Scenario	Braintree	Bury Farm, Bury Lane, Hatfield Peverel	46	100%
Core Scenario	Braintree	Land Between Hatfield Peverel & Witham South of A12	450	50%
Core Scenario	Braintree	Land Between Long Green And Braintree Road	250	100%
Core Scenario	Braintree	Phase 1A of South West Witham Growth Location, off Hatfield Road	11	100%
Core Scenario	Braintree	Phase 2 South West Witham Growth Location, off Hatfield Road	42	100%
Core Scenario	Braintree	Phase 5 South West Witham Growth Location, off Hatfield Road	124	100%
Core Scenario	Braintree	Phases 3B, 4 South West Witham Growth Location, off Hatfield Road	220	100%
Core Scenario	Braintree	Station Field, Land west of Kelvedon Station Station Road (Monks Farm)	250	84%
Core Scenario	Chelmsford	North East Chelmsford	3000	12%
Core Scenario	Chelmsford	North of Broomfield	450	9%
Core Scenario	Chelmsford	Peninsula Site Chelmer Waterside Development Wharf Road Chelmsford	448	100%
Core Scenario	Colchester	Former Severalls Hospital	889	100%
Core Scenario	Colchester	Land off Dyers Road including Fiveways Fruit Farm	605	20%
Core Scenario	Maldon District Council	Wycke Hill North, Maldon	320	100%
Core Scenario	Colchester	Lakelands	254	100%
Core Scenario	Colchester	Land to the West of Lakelands	150	100%
Not in Core Scenario	Braintree	Land at Egypts Farm, Silver End	365	80%
Not in Core Scenario	Braintree	Land east of Silver End	1800	50%
Not in Core Scenario	Braintree	Strategic Growth Location, Land south of Feering/west of A12	795	15%
Not in Core Scenario	Braintree	Towerlands Park	575	65%
Not in Core Scenario	Chelmsford	East Chelmsford - Manor Farm	250	100%
Not in Core Scenario	Chelmsford	Eastwood House Car Park Glebe Road Chelmsford	231	100%
Not in Core Scenario	Chelmsford	Former Gas Works Wharf Road Chelmsford	250	0%
Not in Core Scenario	Chelmsford	Former Royal Mail Premises Victoria Road Chelmsford	203	100%
Not in Core Scenario	Chelmsford	Great Leighs - Land at Moulsham Hall	750	12%
Not in Core Scenario	Chelmsford	Great Leighs - Land East of London Road	250	100%
Not in Core Scenario	Chelmsford	West Chelmsford	800	75%
Not in Core Scenario	Colchester	Middlewick Ranges	1000	20%
Not in Core Scenario	Colchester	Tendring/Colchester Borders Garden Community	1250	20%
Not in Core Scenario	Tendring District Council	Oakwood Park, Little Clacton	918	4%
Not in Core Scenario	Braintree	Strategic Growth Location, Land south of Feering/west of A12	40	100%
Not in Core Scenario	Chelmsford	Great Leighs - Land North and South of Banters Lane	100	100%

A.2 Employment Developments

Developments - Employment Sites

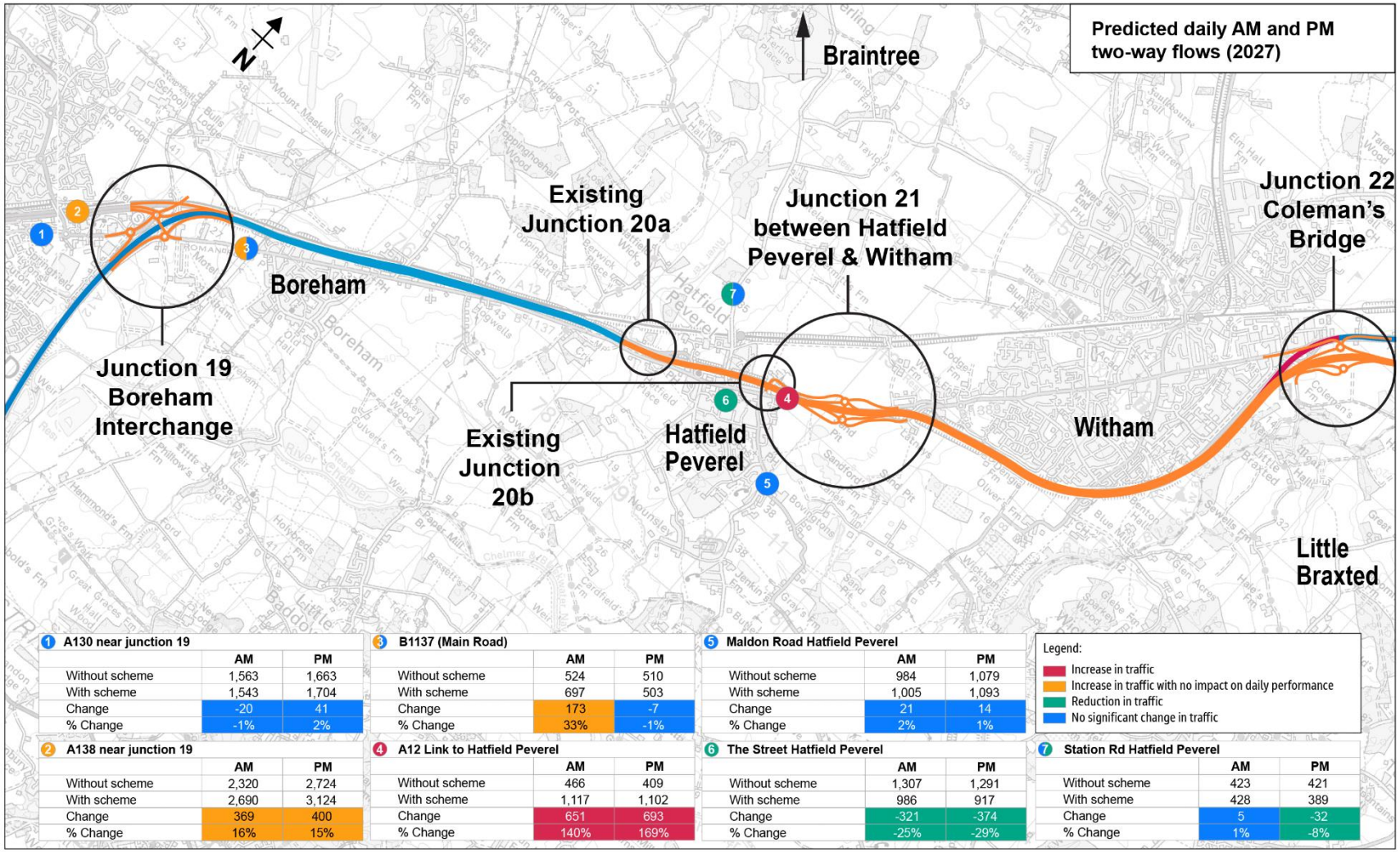
Uncertainty Assigned	Local Authority	Name	% build out by 2027
Core Scenario	Braintree	Land adjoining Burchey Brook Poultry Farm, Eastways, Waterside Business Park, Witham	100%
Core Scenario	Braintree	Burghey Brook Farm, London Road, Rivenhall	100%
Not in Core Scenario	Braintree	Essex Fire and Police HQ, Kelvedon Park	0%
Not in Core Scenario	Braintree	Land Off London Road Feering Essex	100%
Not in Core Scenario	Chelmsford	NE Chelmsford	12%
Not in Core Scenario	Chelmsford	North of South Woodham Ferrers	0%

A.3 Mixed Use Developments

Development - Mixed Use Sites

Uncertainty Assigned	Local Authority	Name	Housing		Employment
			Total Number of dwellings	% of dwellings built by 2027	% build out by 2027
Core Scenario	Chelmsford	Greater Beaulieu Park, White Hart Lane, Springfield	3600	54%	54%
Core Scenario	Chelmsford	University Campus Phase 2 part of Central Park and land at Park Road Chelmsford	426	100%	100%
Core Scenario	Chelmsford	Former Marconi Works, New Street, Chelmsford	418	100%	100%
Core Scenario	Tendring District Council	Harwich Valley, Harwich	297	27%	27%
Core Scenario	Tendring District Council	Barleyfields, Weeley	280	43%	43%
Core Scenario	Chelmsford	University Campus, Phase 1 north, part of Central Park and land at Park Road, Chelmsford	219	100%	100%
Core Scenario	Maldon District Council	Corinthian Place, Maldon Road, Burnham-on-Crouch	180	100%	50%
Core Scenario	Braintree	Land off Cranes Lane Kelvedon Essex	125	100%	100%
Core Scenario	Tendring District Council	Rouses Farm	950	13%	13%
Core Scenario	Tendring District Council	Long Road, Mistley	485	25%	25%
Not in Core Scenario	Tendring District Council	Tendring Colchester Borders Garden Community	8000	4%	4%
Not in Core Scenario	Braintree	Land east of Great Notley, Strategic Growth Location	2000	37%	37%
Not in Core Scenario	Tendring District Council	Hartley Gardens, Clacton on Sea	1700	0%	0%
Not in Core Scenario	Chelmsford	North of South Woodham Ferrers	1000	41%	41%
Not in Core Scenario	Chelmsford	Land north west of Essex County Cricket Ground, New Writtle Street, Chelmsford	357	17%	17%

Appendix B Maps of traffic flow changes on local roads in 2027



1 A130 near junction 19	AM	PM
Without scheme	1,563	1,663
With scheme	1,543	1,704
Change	-20	41
% Change	-1%	2%

2 A138 near junction 19	AM	PM
Without scheme	2,320	2,724
With scheme	2,690	3,124
Change	369	400
% Change	16%	15%

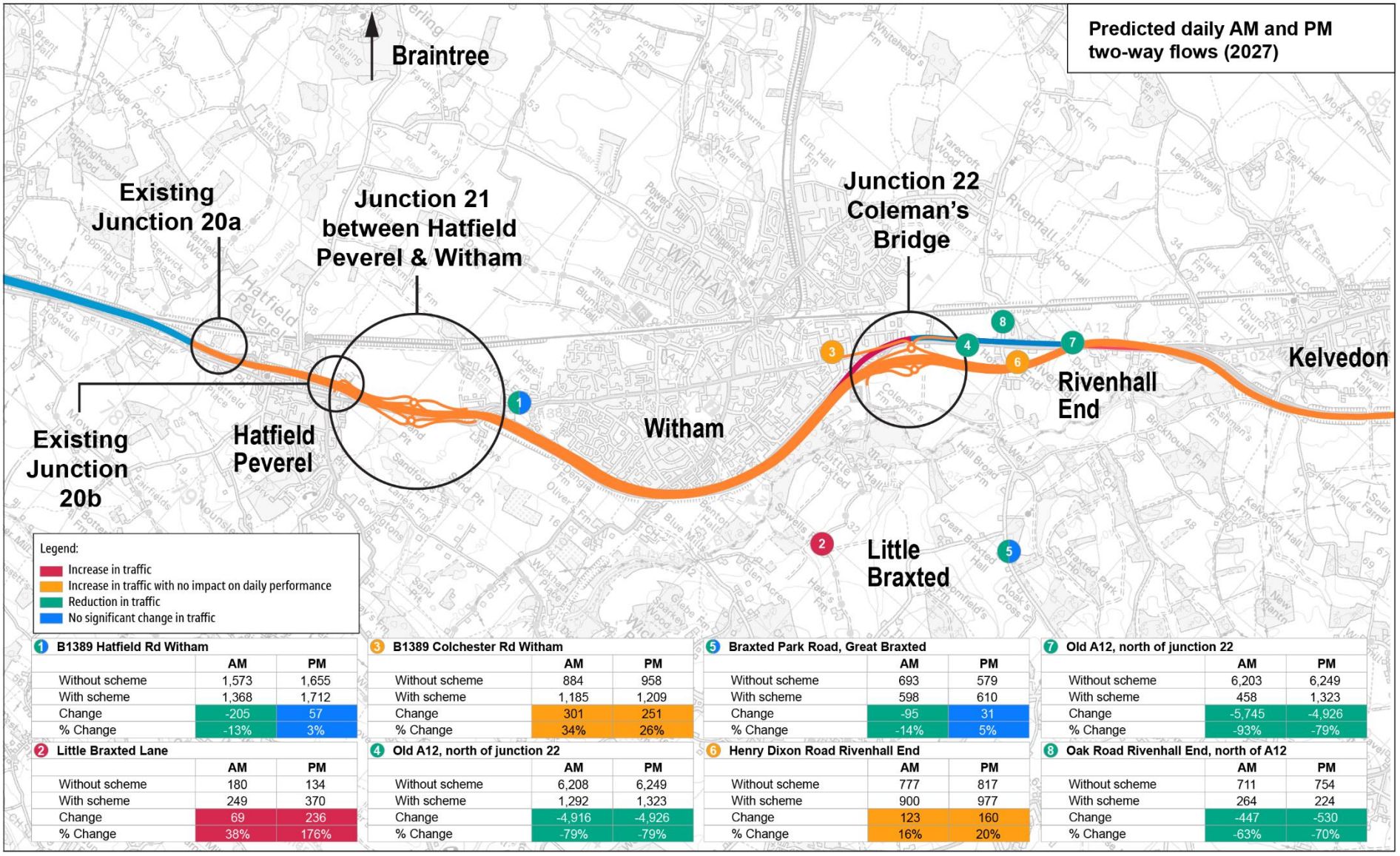
3 B1137 (Main Road)	AM	PM
Without scheme	524	510
With scheme	697	503
Change	173	-7
% Change	33%	-1%

4 A12 Link to Hatfield Peverel	AM	PM
Without scheme	466	409
With scheme	1,117	1,102
Change	651	693
% Change	140%	169%

5 Maldon Road Hatfield Peverel	AM	PM
Without scheme	984	1,079
With scheme	1,005	1,093
Change	21	14
% Change	2%	1%

6 The Street Hatfield Peverel	AM	PM
Without scheme	1,307	1,291
With scheme	986	917
Change	-321	-374
% Change	-25%	-29%

7 Station Rd Hatfield Peverel	AM	PM
Without scheme	423	421
With scheme	428	389
Change	5	-32
% Change	1%	-8%



1 B1389 Hatfield Rd Witham	AM	PM
Without scheme	1,573	1,655
With scheme	1,368	1,712
Change	-205	57
% Change	-13%	3%

3 B1389 Colchester Rd Witham	AM	PM
Without scheme	884	958
With scheme	1,185	1,209
Change	301	251
% Change	34%	26%

5 Braxted Park Road, Great Braxted	AM	PM
Without scheme	693	579
With scheme	598	610
Change	-95	31
% Change	-14%	5%

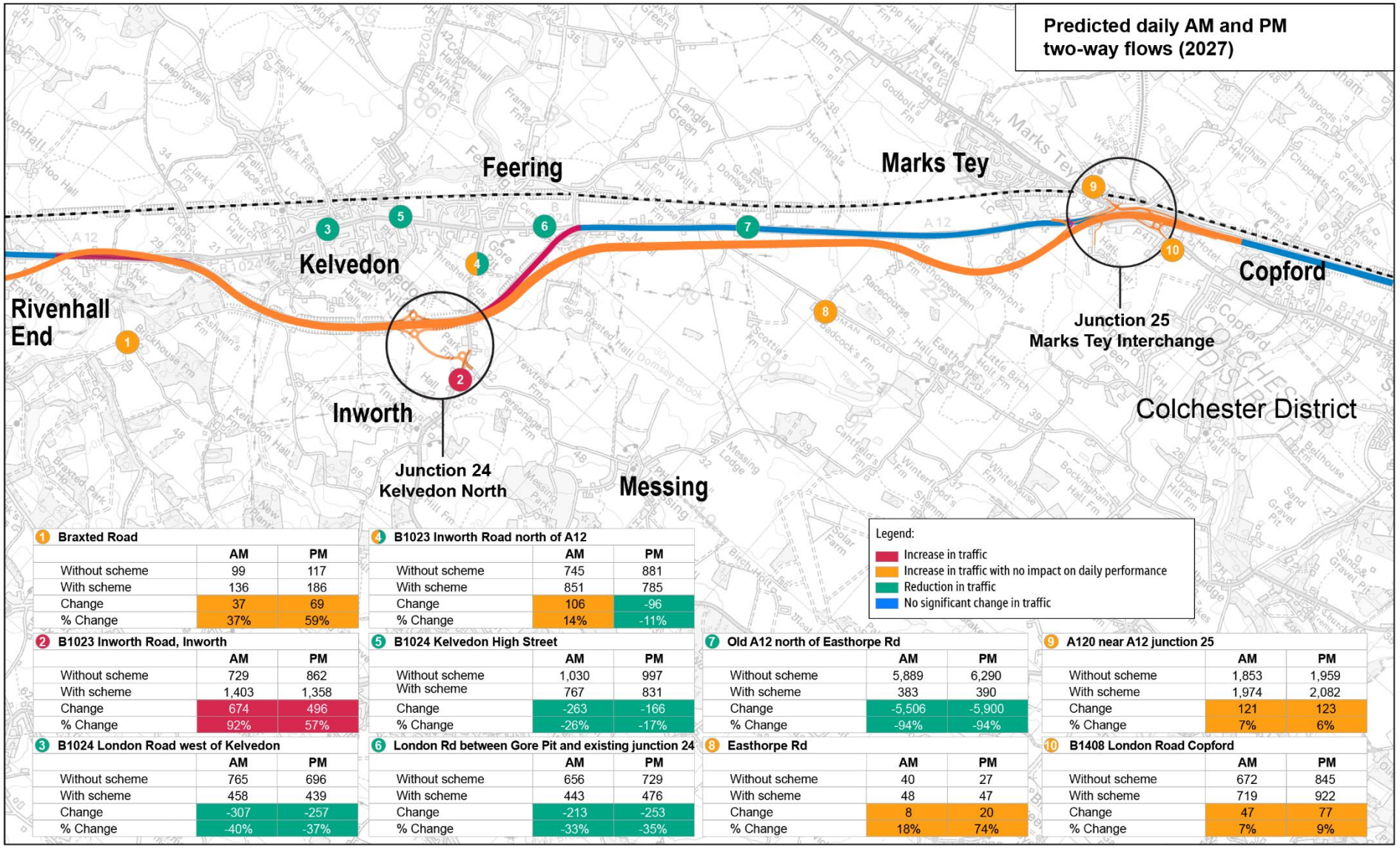
7 Old A12, north of junction 22	AM	PM
Without scheme	6,203	6,249
With scheme	458	1,323
Change	-5,745	-4,926
% Change	-93%	-79%

2 Little Braxted Lane	AM	PM
Without scheme	180	134
With scheme	249	370
Change	69	236
% Change	38%	176%

4 Old A12, north of junction 22	AM	PM
Without scheme	6,208	6,249
With scheme	1,292	1,323
Change	-4,916	-4,926
% Change	-79%	-79%

6 Henry Dixon Road Rivenhall End	AM	PM
Without scheme	777	817
With scheme	900	977
Change	123	160
% Change	16%	20%

8 Oak Road Rivenhall End, north of A12	AM	PM
Without scheme	711	754
With scheme	264	224
Change	-447	-530
% Change	-63%	-70%



1 Braxted Road

	AM	PM
Without scheme	99	117
With scheme	136	186
Change	37	69
% Change	37%	59%

2 B1023 Inworth Road, Inworth

	AM	PM
Without scheme	729	862
With scheme	1,403	1,358
Change	674	496
% Change	92%	57%

3 B1024 London Road west of Kelvedon

	AM	PM
Without scheme	765	696
With scheme	458	439
Change	-307	-257
% Change	-40%	-37%

4 B1023 Inworth Road north of A12

	AM	PM
Without scheme	745	881
With scheme	851	785
Change	106	-96
% Change	14%	-11%

5 B1024 Kelvedon High Street

	AM	PM
Without scheme	1,030	997
With scheme	767	831
Change	-263	-166
% Change	-26%	-17%

6 London Rd between Gore Pit and existing junction 24

	AM	PM
Without scheme	656	729
With scheme	443	476
Change	-213	-253
% Change	-33%	-35%

7 Old A12 north of Easthorpe Rd

	AM	PM
Without scheme	5,889	6,290
With scheme	383	390
Change	-5,506	-5,900
% Change	-94%	-94%

8 Easthorpe Rd

	AM	PM
Without scheme	40	27
With scheme	48	47
Change	8	20
% Change	18%	74%

9 A120 near A12 junction 25

	AM	PM
Without scheme	1,853	1,959
With scheme	1,974	2,082
Change	121	123
% Change	7%	6%

10 B1408 London Road Copford

	AM	PM
Without scheme	672	845
With scheme	719	922
Change	47	77
% Change	7%	9%

Appendix C Traffic flow changes in 2042

Table C.1 Local road Average Annual Traffic (AM peak hour) – 2042

Local Road Name	Without Scheme	With Scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	600	817	36%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	1,409	1,128	-20%
Station Road, Hatfield Peverel	503	512	2%
Maldon Road Hatfield Peverel	991	1,052	6%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	1,675	1,463	-13%
Little Braxted Lane	225	289	29%
B1389 Colchester Road, Witham	908	1,245	37%
Braxted Park Road, Great Braxted	726	670	-8%
Henry Dixon Road, Rivenhall End	911	1,076	18%
Oak Road, Rivenhall End, north of A12	784	296	-62%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	123	183	49%
B1024 London Road, west of Kelvedon	815	504	-38%
B1024 Kelvedon High Street	1,176	927	-21%
B1023 Inworth Road, Inworth	716	1,509	111%
B1023 Inworth Road, north of A12	730	930	28%
London Road between Gore Pit Lane and existing J24	725	540	-25%
Easthorpe Road	89	64	-29%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	822	935	14%

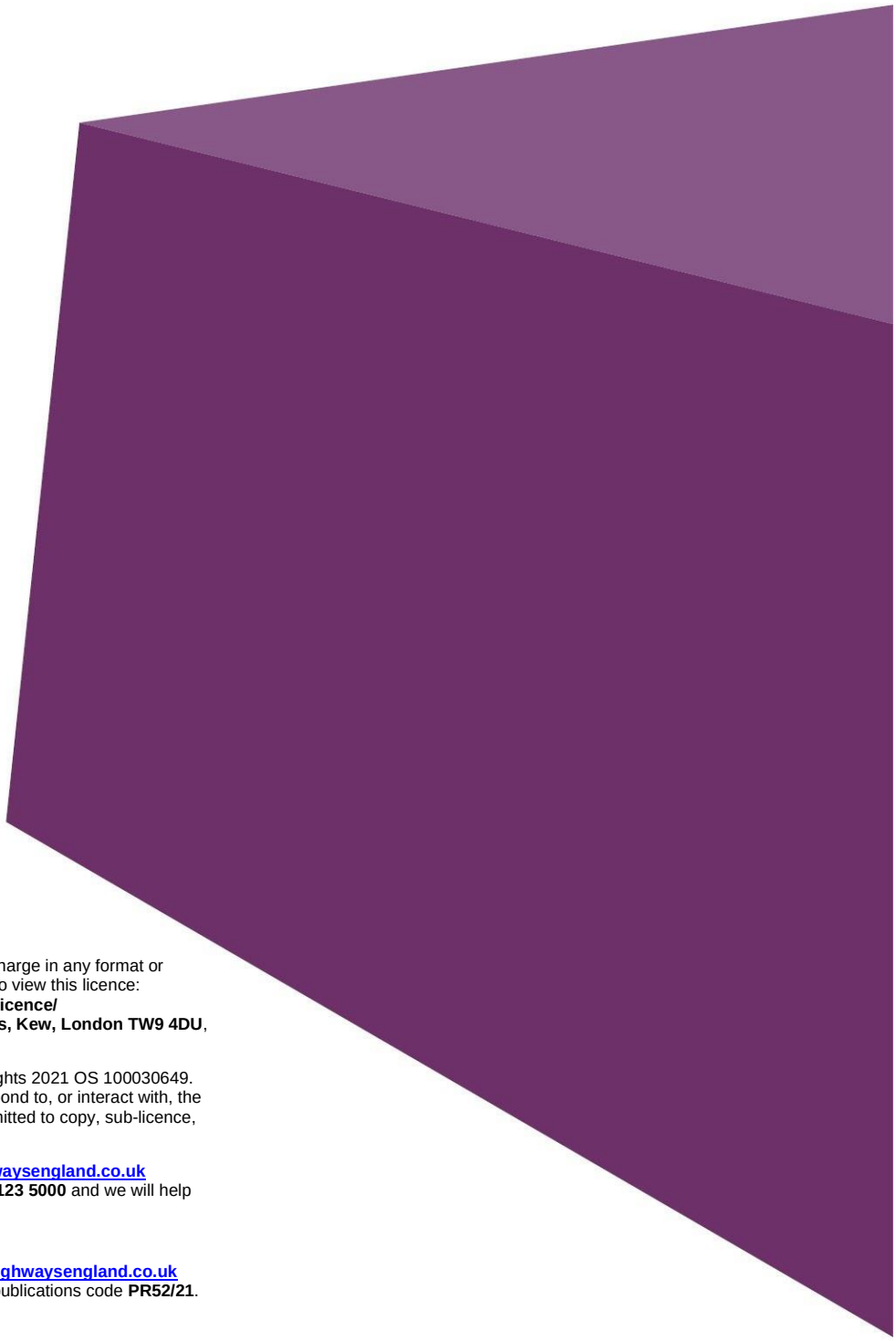
Table C.2 Local road Average Annual Traffic (PM peak hour) – 2042

Local Road Name	Without Scheme	With Scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	625	594	-5%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	1,369	1,042	-24%
Station Road, Hatfield Peverel	498	457	-8%
Maldon Road Hatfield Peverel	1,061	1,147	8%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	1,700	1,784	5%
Little Braxted Lane	167	409	146%
B1389 Colchester Road, Witham	1,010	1,278	26%
Braxted Park Road, Great Braxted	645	676	5%
Henry Dixon Road, Rivenhall End	916	1,134	24%
Oak Road, Rivenhall End, north of A12	836	250	-70%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	151	240	58%
B1024 London Road, west of Kelvedon	749	530	-29%
B1024 Kelvedon High Street	1,115	1,001	-10%
B1023 Inworth Road, Inworth	855	1,471	72%
B1023 Inworth Road, north of A12	872	798	-8%
London Road between Gore Pit Lane and existing J24	771	536	-30%
Easthorpe Road	38	78	106%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	982	1,109	13%

Table C.3 Local Road Average Annual Daily Traffic (total 24hr traffic) – 2042

Local Road Name	Without Scheme	With Scheme	% Change
Flows Around Boreham (A12 junction 19)			
B1137 Main Road, Boreham	6,430	7,820	22%
Flows Around Hatfield Peverel (A12 junctions 20a, 20b and 21)			
The Street, Hatfield Peverel	17,620	12,230	-31%
Station Road, Hatfield Peverel	5,030	4,970	-1%
Maldon Road Hatfield Peverel	13,640	14,630	7%
Flows Around Witham and Rivenhall End (A12 junctions 21 and 22)			
B1389 Hatfield Road, Witham	20,850	19,320	-7%
Little Braxted Lane	1,490	3,980	167%
B1389 Colchester Road, Witham	11,600	15,070	30%
Braxted Park Road, Great Braxted	7,950	7,370	-7%
Henry Dixon Road, Rivenhall End	10,900	12,140	11%
Oak Road, Rivenhall End, north of A12	10,310	2,980	-71%
Flows around Kelvedon (A12 junction 24)			
Braxted Road	1,400	2,390	71%
B1024 London Road, west of Kelvedon	9,890	6,040	-39%
B1024 Kelvedon High Street	13,350	10,540	-21%
B1023 Inworth Road, Inworth	11,230	18,530	65%
B1023 Inworth Road, north of A12	11,500	10,550	-8%
London Road between Gore Pit Lane and existing J24	9,550	5,600	-41%
Easthorpe Road	590	710	20%
Flows around Marks Tey (A12 junction 25)			
B1408 London Road, Copford	11,230	12,250	9%

Plate C.1 Strategic network Average Annual Daily Traffic (AADT) – 2042



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