Suffolk County Council

ISPA LOCAL PLAN MODELLING

Methodology Report

ISPA-MR7
JANUARY 2020

PUBLIC

Suffolk County Council

ISPA LOCAL PLAN MODELLING

Methodology Report

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70044944

OUR REF. NO. ISPA-MR7

DATE: JANUARY 2020

WSP

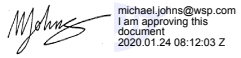
WSP House
70 Chancery Lane
London
WC2A 1AF

Phone: +44 20 7314 5000

Fax: +44 20 7314 5111

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft	Final	Final – with Addendum	
Date	December 2019	January 2020	January 2020	
Prepared by	Michael Johns	Lachlan Piper	Lachlan Piper	
Signature				
Checked by		Michael Johns	Michael Johns	
Signature				
Authorised by		Michael Johns	Michael Johns	
Signature				
Project number	70044944	70044944	70044944	
Report number	ISPA-MR7	ISPA-MR7	ISPA-MR7	
File reference				

Addendum:

This report includes minor amendments compared to the version available for the Ipswich Local Plan public consultation from 15th January 2020. The changes made are as follows:

- Bullet points at paragraph 2.2.1 have been updated to reflect the headers of the report sections being referring to
- New paragraph added at 4.2.5 detailing scaling factors applied to specific housing and job numbers at individual sites

CONTENTS

TABLES

FIGURES

APPENDICES

1 GLOSSARY

- **Adjusted Planning Data** – TEMPro (see below) allows for the use of alternative assumptions which are different to the standard set of assumptions. This allows for specific allocated developments to be discounted from the assumptions or to adjust the overall assumptions to tie in with alternative data sources.
- **AM Peak** – the morning peak hour (08:00 – 09:00)
- **Assignment** – A Traffic Assignment Model, in this case SATURN, has been used. An assignment model requires two general inputs – a "trip matrix" and a "network" (thought of as the "demand" and "supply" inputs – provided by the user). These are input into a "route choice" model which allocates or assigns trips to "routes" through the network, as a result total flows along links in the network may be summed and the corresponding network "costs" (e.g. times) calculated.
- **BDC** – Babergh District Council
- **Committed Development** – All land with current planning permission or allocated for development in adopted development plans (particularly residential development) (Planning Portal Glossary).
- **ESC** – East Suffolk Council
- **HE** – Highways England
- **IBC** – Ipswich Borough Council
- **ISPA** – Ipswich Strategic Planning Area
- **Local Plan** - A Local Plan is a set of documents that determine how development will be planned over time.
- **LPA** – Local Planning Authority
- **Matrix** – see Trip Matrix
- **MSDC** – Mid Suffolk District Council
- **Network** – specifies the physical structure of the roads, etc upon which trips take place and the parameters within it. In this report, parameters is being used as a generic descriptor of all of the pieces of information / options that go into the Saturn network, it is not a specific modelling term.
- **NTEM** – National Trip End Model, Latest version 7.2. The National Trip End Model produces estimates of person travel by all modes based on 2011 Census boundaries. The model outputs trip productions (e.g. homes) and trip attractions (e.g. sites of employment) in each zone (collectively known as trip-ends), which may be separated by mode, journey purpose, dwelling car ownership category and time period.
- **NTM** – National Transport Model provides a means of comparing the consequences of national transport policies or widely-applied local transport policies, against a range of background scenarios which take into account the major factors affecting future patterns of travel. The model produces future forecasts of road traffic growth, vehicle tailpipe emissions, congestion and journey time (Department for Transport website).
- **PCU – Passenger Car Unit**, is a method used in Transport Modelling to allow for the different vehicle types within a traffic flow group to be assessed in a consistent manner. Measured to be 5.75 m. Factors used in the SCTM are 1 for a car or light goods vehicle and 2.3 for heavy goods vehicle.

- **Permitted Development** - Permission to carry out certain limited forms of development without the need to make an application to a local planning authority, as granted under the terms of the Town and Country Planning (General Permitted Development) Order (Planning Portal Glossary).
- **Person Trip Rate** – The number of people making a given trip as opposed to the number of vehicles making a trip.
- **PM Peak** – Afternoon Peak (17:00 – 18:00)
- **SATURN** – Simulation and Assignment of Traffic to Urban Road Networks is a suite of network analysis programs used to assess the impact of road-investment schemes. Current version 11.3.12U. See also assignment. Further information can be found here: https://saturnsoftware.co.uk/
- **SCC** – Suffolk County Council
- **SCDC** – Suffolk Coastal District Council (now part of East Suffolk Council)
- **SCTM** – Suffolk County Transport Model
- **SRN** – Strategic Road Network; this is the road network under the responsibility of Highways England. Within Suffolk this encompasses the A14, A11, A47 and sections of the A12.
- **TEMPro** - TEMPro is the Trip End Model Presentation Program. The National Trip End Model (NTEM) forecasts and the TEMPro software are used for transport planning purposes. The forecast includes: population, employment, dwellings by car ownership, trip ends, and simple traffic growth factors based on data from the National Transport Model. The current version, and the version used for this work, is NTEM 7.2. Further information can be found at: https://www.gov.uk/government/collections/tempro
- **Trip Matrix** – the "Trip Matrix" Tij specifies the number of trips from zone i to zone j
- **V/C Ratio** – Volume / Capacity Ratio. The assigned model flow is the volume of traffic in PCUs per hour, with the V/C percentage calculated as the volume relative to the capacity in percentage terms.
- **WDC** – Waveney District Council (now part of East Suffolk Council)
- **WebTAG** – Web Transport Appraisal Guidance. Documentation produced by the Department for Transport (DfT) to assist in transport appraisal and modelling to ensure consistency and robustness.
- **Windfall Sites** – sites for housing that have yet to be identified, accounted for through background growth.
- **Zone Loading Point** – the origins and destinations of trips within a network

A further glossary of planning terms can be found here:
https://www.planningportal.co.uk/directory/4/glossary

2 INTRODUCTION

2.1 BACKGROUND

2.1.1. This report provides details on updated strategic modelling which has been undertaken using the Suffolk County Transport Model (SCTM). The SCTM is a modelling tool which WSP have previously been commissioned by Suffolk County Council (SCC) to build and utilise to provide transport modelling evidence. The SCTM has been used to model various distributions of housing and employment related to the Local Plans for Local Planning Authorities (LPAs) in Suffolk. Prior to this report, the SCTM was used to model the preferred options for the Suffolk Coastal planning area within East Suffolk and Ipswich Borough Council. Development options were also included for Babergh and Mid Suffolk. The following reports are relevant to the previous work which was undertaken:

- MR1 Local Plan Modelling Methodology Report (January 2019)
- Forecasting Report Volume 1 – Suffolk Coastal and Ipswich (August 2018)[1]
- Forecasting Report Volume 2 – Suffolk Coastal and Ipswich (January 2019)[2]
- ISPA Modelling Methodology Report (August 2019)[3]
- ISPA Forecasting Report (August 2019)[4]
- Highways England RIS Scheme SRN Impacts Technical Note (August 2019)[5]

2.1.2. Further strategic modelling has since been undertaken to enable SCC and the LPAs to provide further clarity on the mitigation measures which will be used to support the growth identified in the respective Local Plans. A key element of this relates to modal shift away from car travel. This has been applied in the strategic model using a series of targeted reductions in the forecast traffic to both existing travel patterns in the model and traffic generated by new developments. This methodology report details how this approach of applying a modal shift has been undertaken and summarises the inputs to these revised forecasts.

2.1.3. The following forecast years have been considered, with traffic growth applied to a 2016 baseline

- 2036; end of Local Plan period for all LPAs
- 2026; interim year during Local Plan period

2.1.4. The interim year of 2026 has been generated in order to determine to what extent the congestion issues shown at the end of the Local Plan period (2036) are predicted to occur in order to inform the

[1] This report contains tests of different distributions of housing and employment growth which were used to inform the Preferred Option for Suffolk Coastal and Ipswich
[2] This report contains modelling related to the Preferred Option for Suffolk Coastal and Ipswich
[3] This report formed a post-examination submission document for Suffolk Coastal, it details the methodology which encompassed a demand adjustment based on potential mitigation measures which could be introduced to reduce private car use
[4] This report formed a post-examination submission document for Suffolk Coastal, it details the results from the demand adjusted models for all ISPA authorities focusing on issues which are on the SCC highways
[5] This technical note formed a post-examination submission document for Suffolk Coastal, it tests the impact of potential Road Investment Strategy schemes focusing on the SRN combined with ISPA Local Plan growth

timescales for when mitigation will be required during the Local Plan period. This methodology report includes information on how this interim forecast year has been derived.

2.1.5. This report details the methodology applied to updated strategic modelling which has been undertaken to support the Local Plan for the LPAs which comprise the Ipswich Strategic Planning Area (ISPA), namely the following Local Planning Authorities (LPAs):

- Babergh District Council (BDC)
- Ipswich Borough Council (IBC)
- Mid Suffolk District Council (MSDC)
- East Suffolk Council (ESC) (Note that the ISPA covers the part of East Suffolk which was formerly Suffolk Coastal District).

2.1.6. The methodology comprises targeted reductions to both existing road users and trips generated by future developments. These reductions are representative of approaches to encourage individuals to shift away from using car travel as their main mode of transport.

2.2 REPORT STRUCTURE

2.2.1. This report is split into the following sections

- Section 3: Future highway schemes
- Section 4: Ipswich Strategic Planning Area (ISPA) Local Plan growth
- Section 5: Demand adjustments targets and forecast methodology
- Section 6: Matrix total comparisons
- Section 7: Summary

3 FUTURE HIGHWAY SCHEMES

3.1.1. This section details the future highway infrastructure schemes which have been included in the forecast model networks.

3.1.2. Table 3-1 lists the highway schemes which have been included in Babergh and Mid Suffolk

Table 3-1 – Babergh / Mid Suffolk future highway schemes

District / Borough	Description	Mitigation
Babergh	Chilton Woods access road	Access road between A134 Springlands Way (new roundabout) and Acton Lane (new priority junction)
Babergh	A1071 / Swan Hill roundabout	Capacity improvements
Babergh	A1071 / Hadleigh Road signals	Capacity improvements
Babergh	A1071 / Poplar Lane	Signalisation as part of access arrangements for Wolsey Grange
Babergh	A1214 London Road	New signalised junction part of access arrangements for Wolsey Grange
Mid Suffolk	A140 Eye Airfield	Roundabout improvements

3.1.3. Table 3-2 shows the future highway schemes which have been included within Ipswich.

Table 3-2 – Ipswich future highway schemes

District / Borough	Description	Mitigation
Ipswich	Bixley Road / Heath Road / Foxhall Road	Additional lane NB for Bixley Road / Additional lane SB for Heath Road
Ipswich	Nacton Road / Maryon Road	Turn WB Nacton to two lanes, and EB Nacton to one lane
Ipswich	Upper Orwell Street	Changed to one-way southbound from St Helen's Street
Ipswich	St Helen's Street / Bond Street	Bus lane removal
Ipswich	A1214 / Bell Lane	Ban of right turn from A1214 onto Dr Watson Lane. Signalised junction of A1214 / Bell Lane changed to priority-controlled roundabout

District / Borough	Description	Mitigation
Ipswich	Ipswich Radial Corridor Route improvements - Felixstowe Road	Capacity increase to Felixstowe Road & Bixley Road arms of roundabout with A1156 Bucklesham Road. Capacity increase at Bixley Road / Ashdown Way junction
Ipswich	Ipswich Garden Suburb – Henley Gate	Two signalised junctions included as part of site access onto Henley Road
Ipswich	Ipswich Garden Suburb – Fonnereau	Priority controlled junction included on Westerfield Road in relation to access
Ipswich	Ipswich Garden Suburb – Red Hill Farm	Two priority-controlled junctions included on Westerfield Road, north and south of Fonnereau access junction
Ipswich	A1214 Valley Road / Westerfield Road	Increased capacity modelled on A1214 approaches to roundabout due to flares
Ipswich	A1214 Valley Road / Tuddenham Road	Increased capacity modelled on A1214 approaches to roundabout due to flares
Ipswich	Europa Way link road	Link road between Sproughton Road and Bramford Road, extension of Europa Way with priority-controlled roundabouts

3.1.4. Table 3-3 shows the future highway schemes included within Suffolk Coastal

Table 3-3 – Suffolk Coastal future highway schemes

District / Borough	Description	Mitigation
Suffolk Coastal	Brightwell Lakes - A12 corridor improvement[6]	A12 / Eagle Way / Anson Road roundabout signalisation
Suffolk Coastal	Brightwell Lakes - A12 corridor improvement	A12 / Eagle Way / Gloster Road roundabout signalisation
Suffolk Coastal	Brightwell Lakes - A12 corridor improvement	A12 / Foxhall Road / Newbourne Road roundabout signalisation
Suffolk Coastal	Brightwell Lakes - A12 corridor improvement	A14 Junction 58 signalisation

[6] Brightwell Lakes is the development formerly referred to as Adastral Park

District / Borough	Description	Mitigation
Suffolk Coastal	Brightwell Lakes - Main site access	Signalised junction between Gloster Road & Foxhall Road roundabouts
Suffolk Coastal	Brightwell Lakes - Other site accesses	Phase 2 access onto Newbourne Road, Phase 3 access onto link forming junction with Gloster Road
Suffolk Coastal	Walton Link Road, Felixstowe	Link road between Candlet Road and Walton High Street, as well as access junction for development
Suffolk Coastal	Innocence Farm access junction	Provision of access arrangements allowing all-movements junction to & from the site at the A14

3.1.5. Table 3-4 outlines the future highway schemes included outside of the ISPA within Suffolk

Table 3-4 – Other Suffolk future highway schemes

District / Borough	Description	Mitigation
St Edmundsbury	Bury St Edmunds Eastern Relief Road	Now built and open, but included in forecast only as base year model is 2016 prior to opening
St Edmundsbury	Haverhill NW Relief Road	Relief Road between A1307 and A143
St Edmundsbury	Bury St Edmunds South Eastern Relief Road	Link road south of A14 Junction 44
Waveney	Beccles Southern Relief Road	Relief Road between A145 and Ellough Road. Now built and open but included in forecast only as base year model is 2016, i.e. prior to opening.
Waveney	Lake Lothing Third Crossing, Lowestoft	Additional crossing within Lowestoft, priority-controlled roundabouts at both ends

4 ISPA LOCAL PLAN GROWTH

4.1 IPSWICH STRATEGIC PLANNING AREA (ISPA)

4.1.1. Ipswich has a tightly defined administrative boundary. Urban areas which could be considered as part of Ipswich extend into neighbouring authorities. There are cross boundary issues that are relevant to the development and future of the Ipswich borough, the urban area of Ipswich and surrounding areas

4.1.2. The area has now been extended and renamed as the Ipswich Strategic Planning Area (ISPA). The geography of the area now equates with the Ipswich Housing Market Area and the Ipswich Functional Economic Area, which both extend over the Ipswich Borough, Babergh District, Mid Suffolk District and the Suffolk Coastal area in their entirety, as depicted in Figure 4-1. The Local Plan being produced for Suffolk Coastal covers the area of the former district which now forms part of East Suffolk District Council.

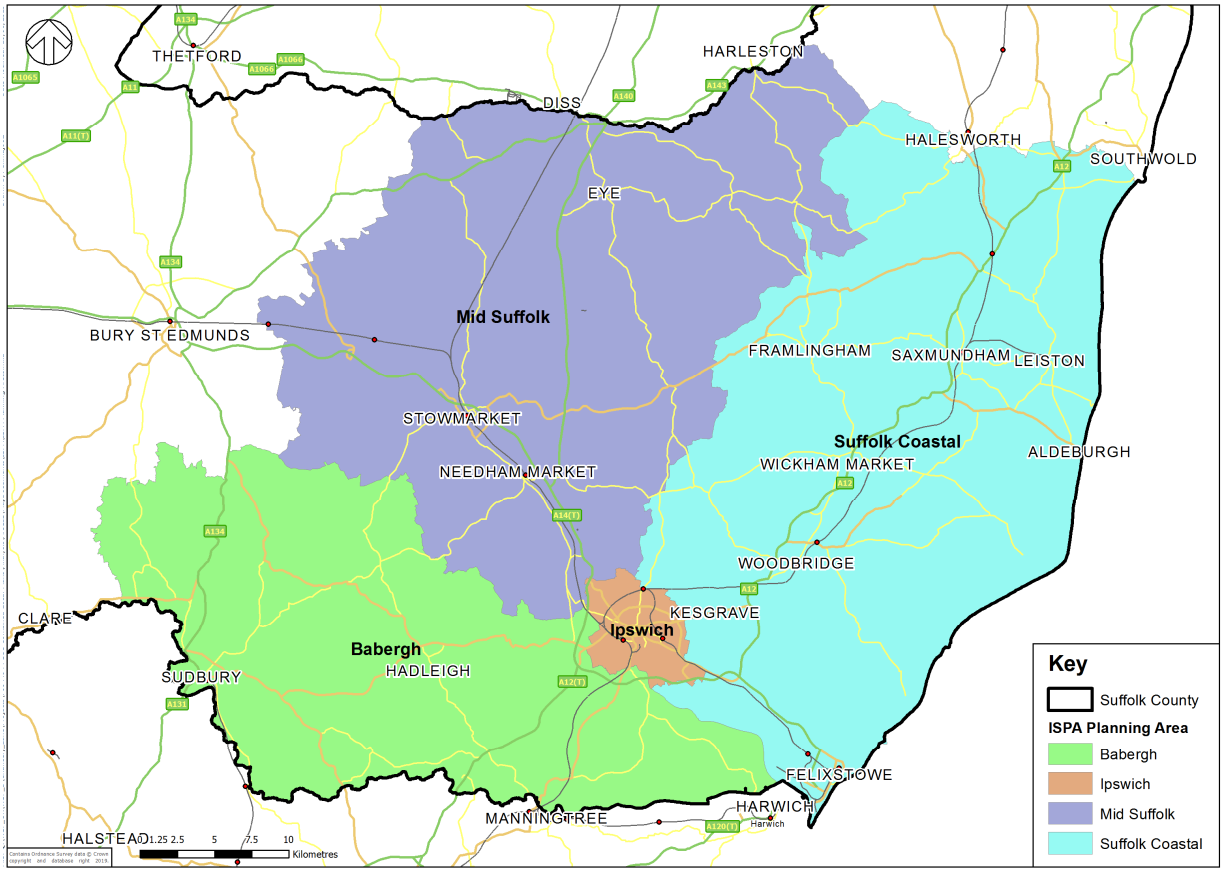


Figure 4-1 - Ipswich Strategic Planning Area (ISPA)[7]

[7] Suffolk Coastal planning area shown in figure is the area formerly referred to as Suffolk Coastal District

4.1.3. Within the Ipswich Strategic Planning Area (ISPA), specific development and job growth for the following planning areas was considered:

- Babergh
- Ipswich
- Mid Suffolk
- Suffolk Coastal

4.2 HOUSING AND JOB GROWTH INPUTS

4.2.1. All forecast housing and job growth takes into account the Suffolk County Transport Model (SCTM), which is currently validated to a 2016 base year. All strategic transport models are required to show a close match to observed traffic volume and journey time data, as set out in DfT Transport Analysis Guidance (TAG). The SCTM is shown to match 2016 traffic conditions to a level which satisfies TAG requirements. This therefore means it forms a suitable basis from which to build future traffic forecasts i.e. estimate what future traffic conditions will be for a given year in the future

4.2.2. Table 4-1 details the information supplied by the LPAs in terms of overall housing and job growth up to the end of the Local Plan period of 2036. These projected figures show that per annum the housing growth modelled is generally in line Local Housing Need figures for each of the LPAs. The job growth included within Babergh, Mid Suffolk and Ipswich is consistent with the baseline jobs growth shown within the ISPA Statement of Common Ground but adjusted from a baseline of 2018 to a 2016 baseline to ensure consistency with the validated base year of the SCTM. The jobs growth modelled in Suffolk Coastal is significantly above the levels detailed in the ISPA Statement of Common Ground. The Suffolk Coastal Local Plan includes an allocation of land to address needs identified in relation to the growth and development of the Port of Felixstowe

Table 4-1 – Total housing and job growth model inputs (2016 to 2036)

LPA	Total Housing Growth (2016 to 2036)	Total Job Growth (2016 to 2036)
Babergh	8,117	3,306
Ipswich	9,502	10,348
Mid Suffolk	10,739	5,905
Suffolk Coastal	13,298	13,472
Total	**41,656**	**33,031**

4.2.3. 2026 forecasts were derived to represent an interim year during the Local Plan period. The total figures by district calculated are shown in Table 4-2. The phasing of the housing and job growth was

estimated based on information provided by the LPAs in terms of the likely timeframes that the developments could be delivered. Once this time period for delivery was established it was assumed a constant per annum rate of housing and job growth would occur within the development during the delivery period.

Table 4-2 - Total housing and job growth model inputs (2016 to 2026)

LPA	Total Housing Growth (2016 to 2026)	Total Job Growth (2016 to 2026)
Babergh	3,922	1,411
Ipswich	3,768	5,471
Mid Suffolk	5,291	2,726
Suffolk Coastal	7,682	6,101
Total	**20,663**	**15,709**

4.2.4. Appendix A contains the housing and job growth assumed for each development.

4.2.5. In order to ensure the housing and job growth inputs matched the respective overall Local Plan targets; certain LPAs were required to have a factor applied to the land use quantum associated with individual developments to scale them down. This scaling was undertaken to ensure the Local Plan growth target of housing and jobs was matched by the sum of the model inputs. The following factors were applied to specific developments:

- Babergh SHELAA and Public Land residential sites – 0.58 (i.e. 58% of the original number of dwellings associated with each site)
- Mid Suffolk SHELAA and Public Land residential sites – 0.64 (i.e. 64% of the original number of dwellings associated with the site)
- Babergh allocated employment sites – 0.15 (i.e. 15% of the original number of jobs / gross floor area associated with the site)
- Mid Suffolk allocated employment sites – 0.85 (i.e. 85% of the original number of jobs / gross floor area associated with the site)
- Suffolk Coastal Uncertainty Log employment sites – 0.68 (i.e. 68% of the original number of jobs / gross floor area associated with the site)

4.3 TRIP GENERATION APPROACH

4.3.1. Trip rates have been derived from TRICS based on land use type. For major developments above 500 dwellings / jobs, trip rates were taken from a Transport Assessment associated with the development where available.

4.3.2. Appendix B contains the trip generation for each development modelled.

4.4 LGV / HGV GROWTH

4.4.1. Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) demand have been factored up using the latest 2018 Road Traffic Forecasts (RTF) from the National Transport Model (NTM). The growth factor from the 2018 RTF detailed in Table 4-3 has been derived from data related to the East of England region.

Table 4-3 – LGV and HGV growth factor by forecast year

LPA	LGV growth factor	HGV growth factor
2026	14.0%	3.2%
2036	28.6%	8.7%

4.4.2. The background growth rates for HGV trips have been adjusted to account for the HGV trips from specific developments. Table 4-4 details how the HGV trips associated with the specific developments is taken into account to adjust the background HGV growth, whereby the specific development trips are removed from the background growth. Following this process, if this leads to specific HGV trip generation which is greater than the RTF growth, then a factor of 1 is applied to background growth, effectively keeping this the same as the 2016 base year demand.

Table 4-4 –HGV growth factor adjustment

		2026 AM	2026 PM	2026 AM	2026 PM
Specific development	BMSDC HGV Veh	47	45	92	89
	IBC HGV Veh	21	20	26	26
	SCDC HGV Veh	67	63	155	148
	Total HGV Veh	134	128	274	263
	Total HGV PCU	308	295	630	605
Base PCU Trips		8,990	6,096	8,990	6,096
RTF PCU Growth (base trips x Table 4-3 RTF factor)		291	197	781	530
RTF PCU growth less specific development		-17	-98	+152	-75
Applied Background Growth		1.000	1.000	1.017	1.000

5 DEMAND ADJUSTMENTS AND FORECAST METHODOLOGY

5.1 OVERVIEW

5.1.1. Previous strategic modelling encompassing the housing and job growth within the Local Plans for LPAs within the ISPA showed significant congestion in certain locations for a forecast year representing the end of the Local Plan period. Mitigation has been considered in relation to this forecast Local Plan growth. This includes measures leading to a modal shift away from car travel. This shift to modes other than car travel is considered essential to try to reduce congestion associated with future growth in highway traffic.

5.1.2. In term of the strategic modelling this shift away from car travel takes the form of demand reductions. This means the forecast travel demand which is represented in the strategic model by a matrix of origins (where trips start) and destinations (where trips end) has had targeted reductions applied to car trips. This reduction has been applied differently depending on the type of road users. This is on the presumption that existing road users / travel patterns will have less of a propensity to shift away from car use given they are more likely to have long established travel behaviours. However, new trips associated with specific new housing and employment developments are more likely to be encouraged to shift away from car travel. This is because these road users could be incentivised to use non-car modes of travel by developers or employers.

5.1.3. The forecast demand which comprises the 2026 and 2036 forecasts had targeted reductions applied based on the following categories of trip

- Existing road users / travel patterns
  - This is the 2016 base year traffic with background growth factors applied to it.
  - Background growth factors related to growth which has been assumed in areas outside of the ISPA, and also residual growth within the ISPA which has not been specifically allocated to a development.
  - This residual growth has been spread across all model zones within the respective ISPA LPA
- New road users
  - New trips generated by specific housing or employment developments within the ISPA area.
- Residual local plan growth
  - This relates to housing or job growth which is not specifically modelled. This was included within TEMPRO planning data assumptions. This residual Local Plan growth relates to the cumulative total of any developments below 10 dwellings / jobs and growth not accounted for by the specific developments modelled.

5.2 EXISTING ROAD USERS / TRAVEL PATTERNS

5.2.1. As previously mentioned, vehicular trips in a strategic model are defined in a matrix. A model matrix is defined as a series of trips between a defined origin and destination zone. Zones in a strategic model represent a specific land area and have been defined as a continuous coverage across Suffolk. The model zones are typically the size of a 2011 Census Lower Super Output Area (LSOA), but often smaller in urban areas.

5.2.2. Model zones were classified as urban or rural using a specific dataset from the 2011 Census which provides this classification. Travel distance was also determined between model zones on the basis of crow fly distance between zone centroids. This combination of urban / rural classification and trip length were combined to determine which of the reduction factors shown in Table 5-1 being applied to the existing road users / travel patterns. These adjustments were only applied to trips in the county model which either started and/or completed their journey within the ISPA authorities. For example, a trip within West Suffolk between Mildenhall and Bury St Edmunds would have no adjustment applied to them. However a trip from West Suffolk to Mid Suffolk e.g. Bury St Edmunds to Stowmarket would have an adjustment applied to it.

Table 5-1 – Trip generation reductions applied to existing road users

Trip type	0-2.5km	2.5km-8.5km	8.5km+
Urban-urban	30.00%	15.00%	5.00%
Urban-rural / rural-urban	5.00%	5.00%	5.00%
Rural-rural	0.00%	0.00%	0.00%

The figures used are considered a reasonable starting point for assessing the impacts of modal shift and are applied to all existing road users. The figures are based on the distance being travelled and the environment being travelled in. Therefore, shorter distance trips are considered more likely to be able to shift to alternative modes and trips within or to/from built up urban environments where, generally, more developed transport infrastructure exists, would more readily support a switch to sustainable modes.

Finally, whilst adjustments between certain categorise could be fine-tuned, in some cases the relative number of trips being impacted was small, so, as an example, for the urban-rural trips a consistent 5% was applied, as this was considered the minimum realistic figure for all categories.

5.3 NEW ROAD USERS

5.3.1. New road users relate to the trip generation from specific developments included within the respective Local Plans. Development land uses were classified as either employment or residential, and then further classified into Town Centre, Urban or Rural based on their location.

5.3.2. The following thresholds were used to determine whether a residential development could be considered to be Small, Medium or Large

- Small – 10 to 99 dwellings
- Medium – 100 to 499 dwellings
- Large – 500 dwellings +

5.3.3. These thresholds align with how residential developments have been handled within the strategic model using a proportionate approach. Proportionate means that larger developments are

considered in more detail including both their access strategy and associated trip generation e.g. from a Transport Assessment. In the strategic model, large developments were considered to be those above 500 dwellings which were modelled in detail. Any development below 10 dwellings was not considered as a specific development and included as residual background growth spread across multiple zones within the respective LPA. The categorisation of these developments into Small, Medium and Large was then required to determine the propensity for a percentage reduction in car travel, making the assumption that is more likely larger developments will be able to achieve a higher modal shift.

5.3.4. The following thresholds were used to determine whether an employment development could be considered to be Small, Medium or Large

- Small – 0 to 1,499sqm gross floor area
- Medium – 1,500 sqm to 2,499sqm gross floor area
- Large – 2,500sqm+ gross floor area

5.3.5. The gross floor area for employment developments was either given directly by the LPAs or estimated based on the overall site area in hectares for the site.

Table 5-2 - Trip generation reductions applied to development trip generations

Land Use Type	Development Type	Small	Medium	Large
Residential	Town Centre	10.00%	12.50%	0.00%
Residential	Urban	5.00%	10.00%	10.00%
Residential	Rural	2.00%	2.00%	2.00%
Employment	Town Centre	15.00%	20.00%	20.00%
Employment	Urban	10.00%	15.00%	15.00%
Employment	Rural	3.00%	3.00%	3.00%

5.3.6. As with adjustments to the baseline traffic above, adjustments have been made based on the environment the development is located within e.g. trips within or to/from built up urban environments where, generally, more developed transport infrastructure exists would more readily support a switch to sustainable modes. It has also been assumed that developments of greater size would be better placed to introduce supporting infrastructure and Travel Plans to support a greater switch to sustainable modes.

5.3.7. As above, whilst adjustments between certain categorise could be fine-tuned, in some cases the relative number of trips being impacted was small. As an example, there are no large residential town centre developments, so no adjustment is made as it would not impact on the results.

5.3.8. For any development from which trip rates and trip generation was determined from an existing Transport Assessment (i.e. greater than 500 dwellings / jobs), no trip generation reduction was applied as it was assumed a shift to sustainable travel was already accounted for within the Transport Assessment. No further reduction was applied to avoid doubling the shift to sustainable modes (i.e. especially for the larger developments, the Transport Assessment would have more

specifically assessed the development's traffic impacts based on its location and mitigation strategy).

5.4 RESIDUAL LOCAL PLAN GROWTH

5.4.1. Residual local plan growth was included within TEMPRO planning data assumptions using the Alternative Planning Assumptions tool in order to derive adjusted background car traffic growth factors. This residual growth relates to any developments which are below 10 dwellings / jobs as well as windfall sites. This residual growth also relates to Local Plan growth which has not been specifically allocated to a development at this stage. No demand adjustment was applied to this residual growth. This is because TEMPRO is effectively being relied on to generate the trip generation for this growth, which means the associated trip generation which results from this will be significantly lower than the TRICS based generation used for specific sites. Applying a further demand reduction to this residual growth is considered an approach which would lead to an unrealistically low trip generation for this element of the Local Plan growth.

5.4.2. Table 5-3 details the 2036 residual housing growth included within TEMPRO.

Table 5-3 – Residual local plan growth included within TEMPRO (2016 to 2036)

LPA	Residual Housing Growth (2016 to 2036)
Babergh	971
Ipswich	523
Mid Suffolk	1,122
Suffolk Coastal	1,921
Total	**4,537**

5.4.3. Table 5-4 details the 2026 residual housing growth included within TEMPRO.

Table 5-4 - Residual local plan growth included within TEMPRO (2016 to 2026)

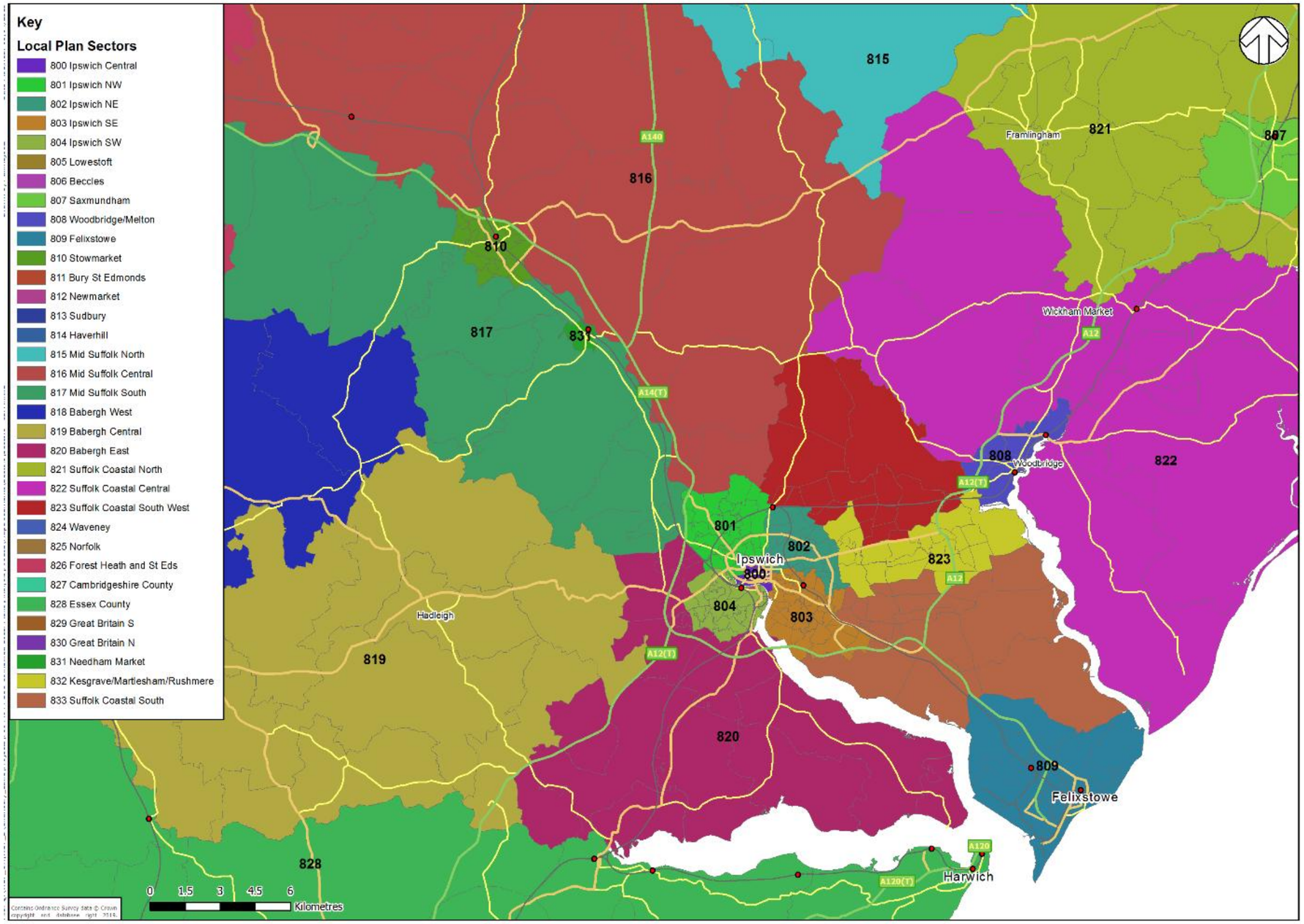
LPA	Residual Housing Growth (2016 to 2026)
Babergh	356
Ipswich	523
Mid Suffolk	454
Suffolk Coastal	961
Total	**2,294**

6 COMPARISON OF MATRIX TOTALS

6.1 SECTORING SYSTEM

6.1.1. A sectoring system was derived in order to group zones within the strategic model into more general areas within Suffolk. The sectoring system can be utilised to summarise the broad strategic movements which are occurring within the ISPA and across Suffolk in general, as individual zone to zone movements are too detailed in isolation to provide an understanding of the general travel patterns across a large area. It will also later be used to determine the origin and destination of traffic routing between particular sections of the network which show congestion. An overview of the sectoring system is presented in Figure 6-1

Figure 6-1 - Sector system



6.1.2. Descriptions of the sectors which are internal to the ISPA authorities are described in Table 6-1:

Table 6-1 – Internal ISPA sectors

Sector Name	LPA	Sector ID
Ipswich Central	Ipswich	800
Ipswich NW	Ipswich	801
Ipswich NE	Ipswich	802
Ipswich SE	Ipswich	803
Ipswich SW	Ipswich	804
Saxmundham	Suffolk Coastal	807
Woodbridge/Melton	Suffolk Coastal	808
Felixstowe	Suffolk Coastal	809
Stowmarket	Mid Suffolk	810
Sudbury	Babergh	813
Mid Suffolk North	Mid Suffolk	815
Mid Suffolk Central	Mid Suffolk	816
Mid Suffolk South	Mid Suffolk	817
Babergh West	Babergh	818
Babergh Central	Babergh	819
Babergh East	Babergh	820
Suffolk Coastal North	Suffolk Coastal	821
Suffolk Coastal Central	Suffolk Coastal	822
Suffolk Coastal South West	Suffolk Coastal	823
Needham Market	Mid Suffolk	831
Kesgrave/Martlesham/Rushmere	Suffolk Coastal	832
Suffolk Coastal South	Suffolk Coastal	833

6.1.3. Additional sectors within Suffolk, external to the ISPA authorities are described in Table 6-2

Table 6-2 – Suffolk sectors external to ISPA

Sector Name	Sector ID
Lowestoft	805
Beccles	806
Bury St Edmunds	811
Newmarket	812
Haverhill	814
Waveney	824

6.1.4. Further sectors covering the areas external to Suffolk are described in Table 6-3

Table 6-3 – External Sectors

Sector Name	Sector ID
Norfolk	825
Cambridgeshire County	827
Essex County	828
Great Britain S	829
Great Britain N	830

6.2 REDUCTION IN EXISTING ROAD USERS / TRAVEL PATTERNS

The reduction in trips to existing car traffic in 2026 is detailed in Table 6-4 for the sectors within the ISPA authorities. These percentage reductions are a result of applying the percentages specified in Table 5-1.

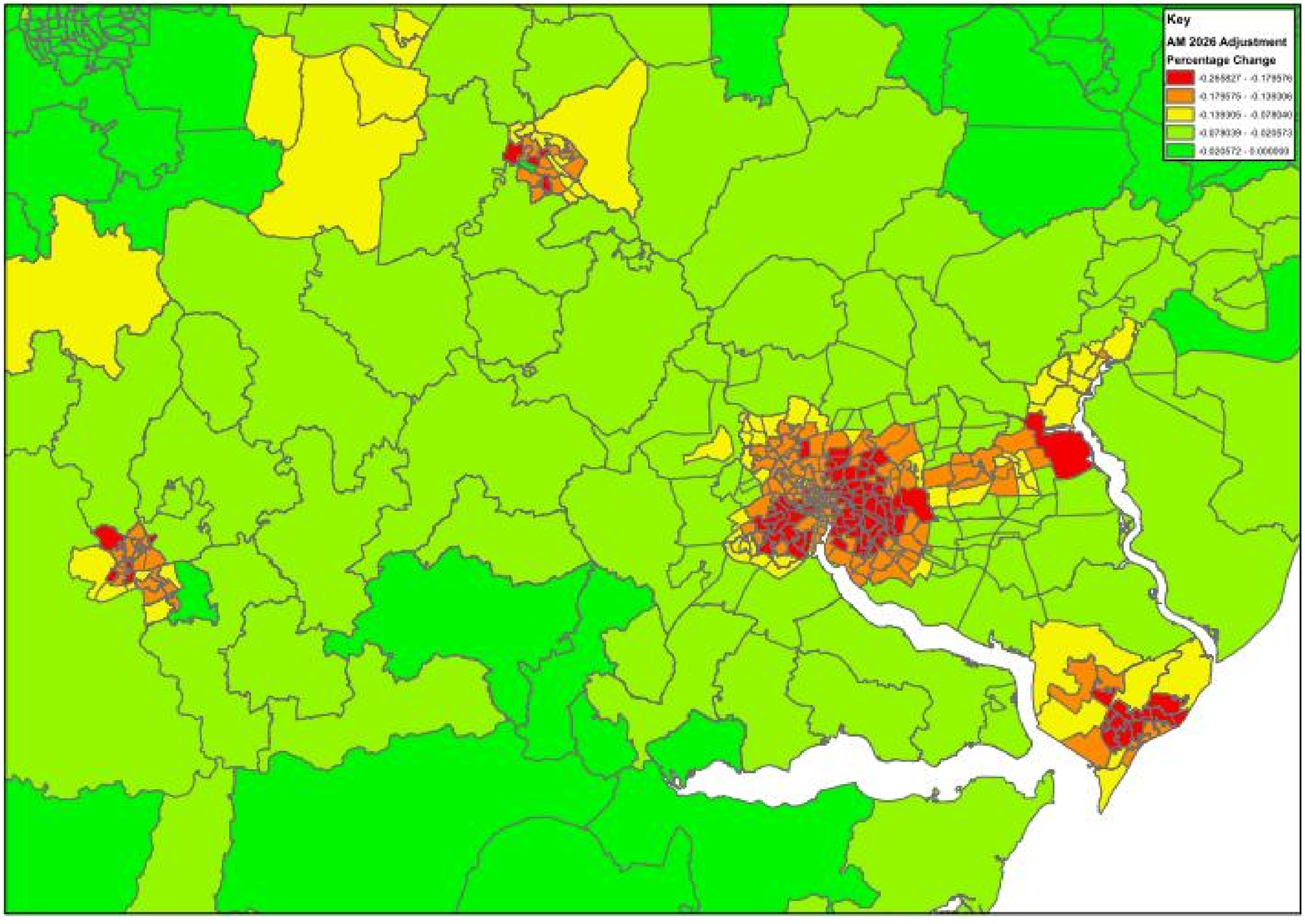
6.2.1. The percentage reductions provide an indication of the relative balance of the short and long-distance trips in the respective sectors and their categorisation into urban / rural. Ipswich North East (Sector 802) carries the highest reduction of 17% in both the AM peak and PM peak. This signifies a high proportion of short distance trips in this sector (below 2.5km). Lower percentages are applied in more rural sectors, this is because the majority of trips in these locations will experience zero reduction if they are a rural-rural sector trip, they would only have a percentage adjustment applied to them if either an origin or destination was within an urban area.

Table 6-4 – 2026 Reduction in existing car trips

Sector	ID	AM 2026		PM 2026	
		Origin	Dest	Origin	Dest
	All	-9%	-9%	-10%	-10%
Ipswich Central	800	-12%	-15%	-15%	-15%
Ipswich NW	801	-13%	-13%	-13%	-14%
Ipswich NE	802	-17%	-17%	-17%	-17%
Ipswich SE	803	-15%	-15%	-15%	-16%
Ipswich SW	804	-17%	-14%	-15%	-14%
Saxmundham	807	-1%	-1%	-1%	-2%
Woodbridge/Melton	808	-13%	-10%	-11%	-12%
Felixstowe	809	-14%	-15%	-14%	-14%
Stowmarket	810	-11%	-11%	-11%	-11%
Sudbury	813	-12%	-12%	-11%	-12%
Mid Suffolk North	815	-1%	0%	-1%	-1%
Mid Suffolk Central	816	-3%	-2%	-3%	-3%
Mid Suffolk South	817	-3%	-2%	-3%	-3%
Babergh West	818	-3%	-2%	-3%	-3%
Babergh Central	819	-3%	-2%	-2%	-3%
Babergh East	820	-4%	-4%	-4%	-5%
Suffolk Coastal North	821	-1%	-1%	-1%	-2%
Suffolk Coastal Central	822	-3%	-2%	-3%	-3%
Suffolk Coastal South West	823	-5%	-6%	-5%	-5%
Needham Market	831	-3%	-2%	-3%	-3%
Kesgrave/Martlesham/Rushmere	832	-13%	-11%	-12%	-13%
Suffolk Coastal South	833	-7%	-7%	-8%	-9%

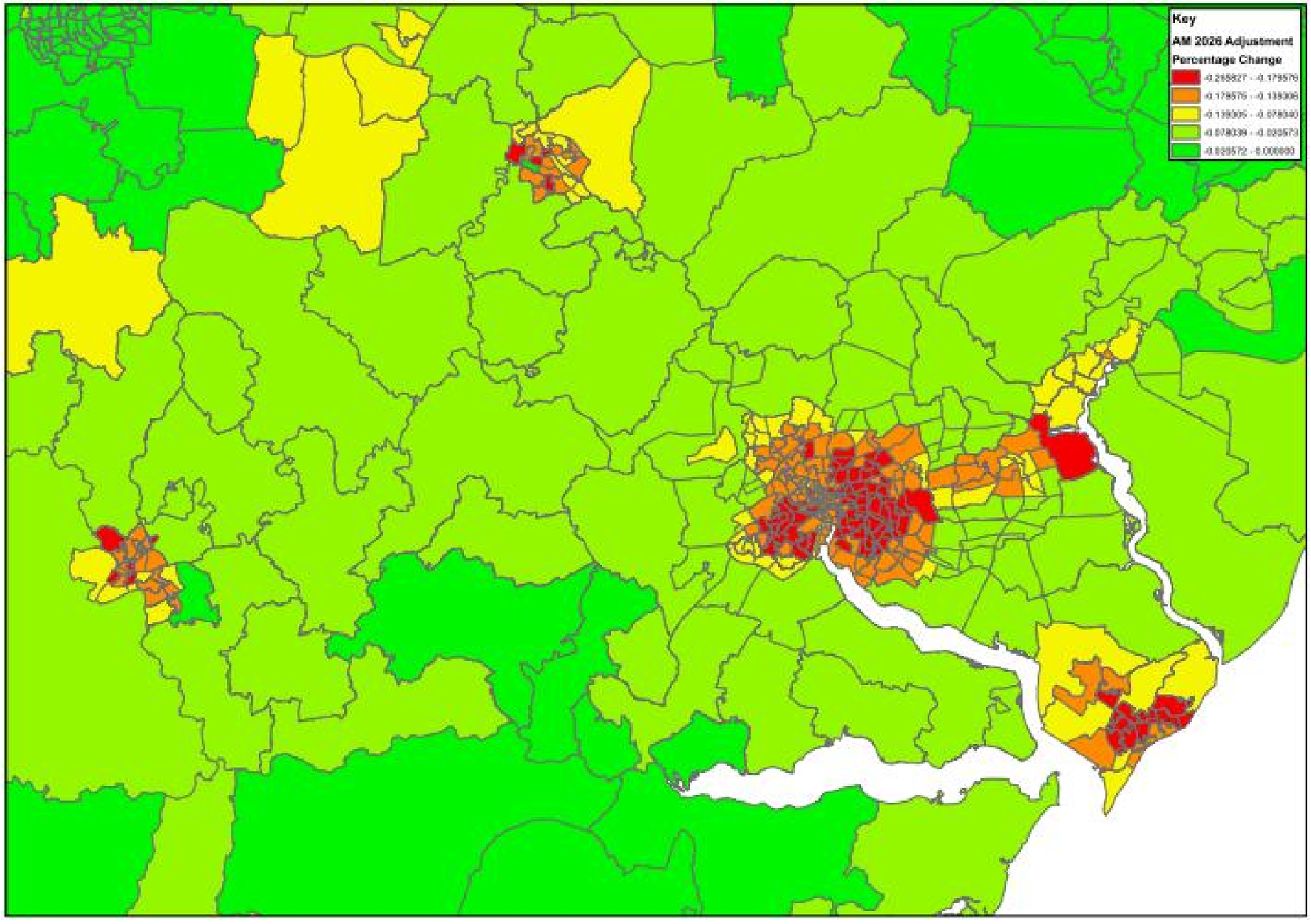
6.2.2. Table 6-2 shows the spatial distribution by model zone of the reductions which have been applied to existing road users / travel patterns in the 2026 AM peak. The colouring is based on proportional change, rather than absolute numbers. This colour banding demonstrates the largest percentage reductions are being applied in urban areas such as Ipswich, Felixstowe, Stowmarket and Sudbury which is expected.

Figure 6-2 - AM 2026 Reduction to existing travel patterns



6.2.3. Figure 6-3 shows the spatial distribution by model zone of the reductions which have been applied to existing road users / travel patterns in the 2026 PM peak. The colouring is based on proportional change, rather than absolute numbers. This colour banding demonstrates the largest percentage reductions are being applied in urban areas such as Ipswich, Felixstowe, Stowmarket and Sudbury which is expected.

Figure 6-3 - PM 2026 Reduction to existing travel patterns



6.2.4. Table 6-5 shows the reduction which has been applied to existing car trips in 2036. These percentage figures are very similar to those in 2026, this is because the distribution and therefore urban / rural split of these trips has not been altered, resulting in the same balance of reduction factors being applied.

Table 6-5 – 2036 Reduction in existing car trips

Sector	ID	AM 2036		PM 2036	
		Origin	Dest	Origin	Dest
	All	-10%	-9%	-10%	-10%
Ipswich Central	800	-12%	-15%	-14%	-15%
Ipswich NW	801	-13%	-12%	-13%	-13%
Ipswich NE	802	-17%	-16%	-17%	-16%
Ipswich SE	803	-15%	-15%	-15%	-16%
Ipswich SW	804	-17%	-13%	-15%	-14%
Saxmundham	807	-2%	-1%	-2%	-2%
Woodbridge/Melton	808	-14%	-10%	-11%	-12%
Felixstowe	809	-15%	-14%	-14%	-14%
Stowmarket	810	-12%	-11%	-11%	-11%
Sudbury	813	-13%	-11%	-11%	-12%
Mid Suffolk North	815	-2%	0%	-1%	-2%
Mid Suffolk Central	816	-4%	-2%	-3%	-4%
Mid Suffolk South	817	-4%	-2%	-3%	-4%
Babergh West	818	-4%	-2%	-3%	-3%
Babergh Central	819	-3%	-2%	-2%	-4%
Babergh East	820	-5%	-4%	-4%	-5%
Suffolk Coastal North	821	-2%	-1%	-1%	-2%
Suffolk Coastal Central	822	-4%	-2%	-3%	-4%
Suffolk Coastal South West	823	-6%	-6%	-5%	-6%
Needham Market	831	-3%	-2%	-3%	-4%
Kesgrave/Martlesham/Rushmere	832	-14%	-11%	-12%	-13%
Suffolk Coastal South	833	-7%	-7%	-8%	-10%

6.3 REDUCTION IN TRIP GENERATION FROM NEW ROAD USERS

6.3.1. Appendix C provides a detail breakdown of how the trip rate reductions have been applied across the ISPA authorities. The most substantial increases occur in Ipswich as Town Centre reductions have been applied for developments. In Suffolk Coastal, Babergh and Mid Suffolk, a greater proportion of developments are in rural areas resulting in a lower trip generation adjustment being applied.

6.3.2. The reduction in trips by LPA for the AM 2026 is described in Table 6-6.

Table 6-6 – AM 2026 trip generation reduction

Source	Dep	Arr	Two-Way	Dep	Arr	Two-Way
Babergh / Mid Suffolk	-82	-57	-138	-3%	-3%	-3%
Ipswich	-118	-147	-265	-9%	-15%	-12%
Suffolk Coastal	-124	-124	-248	-4%	-5%	-5%
Total	**-323**	**-328**	**-651**	**-4%**	**-6%**	**-5%**

6.3.3. The reduction in trips by LPA for the AM 2036 is described in Table 6-7.

Table 6-7 - AM 2036 trip generation reduction

Source	Dep	Arr	Two-Way	Dep	Arr	Two-Way
Babergh / Mid Suffolk	-163	-114	-276	-3%	-3%	-3%
Ipswich	-278	-348	-626	-9%	-15%	-11%
Suffolk Coastal	-251	-266	-516	-5%	-5%	-5%
Total	**-691**	**-727**	**-1418**	**-5%**	**-6%**	**-5%**

6.3.4. The reduction in trips by LPA for the PM 2026 is described in Table 6-8.

Table 6-8 – PM 2026 trip generation reduction

Source	Dep	Arr	Two-Way	Dep	Arr	Two-Way
Babergh / Mid Suffolk	-59	-70	-129	-3%	-2%	-3%
Ipswich	-180	-174	-354	-14%	-12%	-13%
Suffolk Coastal	-133	-122	-255	-6%	-5%	-5%
Total	**-372**	**-366**	**-738**	**-6%**	**-5%**	**-6%**

6.3.5. The reduction in trips by LPA for the PM 2036 is described in Table 6-9.

Table 6-9 – PM 2036 trip generation reduction

Source	Dep	Arr	Two-Way	Dep	Arr	Two-Way
Babergh / Mid Suffolk	-118	-139	-257	-3%	-2%	-3%
Ipswich	-380	-342	-722	-14%	-11%	-12%
Suffolk Coastal	-273	-235	-508	-6%	-5%	-6%
Total	**-772**	**-715**	**-1487**	**-7%**	**-5%**	**-6%**

6.3.6. Appendix D contains the adjusted trip generation by specific development.

6.4 TOTAL TRIP MATRIX REDUCTION

6.4.1. Table 6-10 provides a comparison by vehicle type. The increase in overall county wide traffic for the 2026 AM assignments with and without demand adjustment compared to the 2016 base is presented below. Traffic numbers are presented in Passenger Car Units (PCUs).

Table 6-10 – AM 2026 vs 2016 with and without adjustment overall totals by user class

Veh Type	2016 (pcus)	2026 (pcus)	Abs Diff 2026-2016	% Diff 2026-2016	2026 wAdj (pcus)	Abs Diff wAdj 2026-2016	% Diff wAdj 2026-2016
Car	117251	142627	25376	22%	135688	18437	16%
LGV	12784	14575	1790	14%	14575	1790	14%
HGV	8990	9298	308	3%	9298	308	3%
Total	**139026**	**166500**	**27474**	**20%**	**159561**	**20535**	**15%**

6.4.2. The total reduction in the trip matrix within the county model as a whole is detailed in Table 6-11 for the AM 2026.

Table 6-11 – AM 2026 vs 2026 with adjustment overall totals by user class

Vehicle Type	Original Trips (pcus)	Adjusted Trips (pcus)	Abs Diff Trips (pcus)	% Diff Trips
Car	142627	135688	-6939	-5%
LGV	14575	14575	0	0%
HGV	9298	9298	0	0%
Total	**166500**	**159561**	**-6939**	**-4%**

6.4.3. Table 6-12 provides a comparison by model user class of the increase in overall county wide traffic for the 2026 PM assignments with and without demand adjustment compared to the 2016 base.

Table 6-12 – PM 2026 vs 2016 with and without adjustment overall totals by user class

Vehicle Type	2016 (pcus)	2026 (pcus)	Abs Diff 2026-2016	% Diff 2026-2016	2026 wAdj (pcus)	Abs Diff wAdj 2026-2016	% Diff wAdj 2026-2016
Car	122109	147854	25745	21%	140681	18572	15%
LGV	10405	11862	1457	14%	11862	1457	14%
HGV	6096	6392	295	5%	6392	295	5%
Total	**138610**	**166108**	**27497**	**20%**	**158934**	**20324**	**15%**

6.4.4. The total reduction in the trip matrix within the county model as a whole is detailed in Table 6-13 for the PM 2026

Table 6-13 - PM 2026 vs 2026 with adjustment overall totals by user class

Vehicle Type	Original Trips (pcus)	Adjusted Trips (pcus)	Abs Diff Trips (pcus)	% Diff Trips
Car	147854	140681	-7173	-5%
LGV	11862	11862	0	0%
HGV	6392	6392	0	0%
Total	**166108**	**158934**	**-7173**	**-4%**

Table 6-14 – AM 2036 vs 2016 with and without adjustment overall totals by user class

Vehicle Type	2016 (pcus)	2026 (pcus)	Abs Diff 2026-2016	% Diff 2026-2016	2026 wAdj (pcus)	Abs Diff wAdj 2026-2016	% Diff wAdj 2026-2016
Car	117251	167360	50109	43%	159388	42136	36%
LGV	12784	16445	3661	29%	16445	3661	29%
HGV	8990	9771	781	9%	9771	781	9%
Total	**139026**	**193576**	**54550**	**39%**	**185604**	**46578**	**34%**

The total reduction in the trip matrix within the county model as a whole is detailed in

6.4.5. Table 6-15 for the AM 2036.

Table 6-15 – AM 2036 vs 2026 with adjustment overall totals by user class

Vehicle Type	Original Trips (pcus)	Adjusted Trips (pcus)	Abs Diff Trips (pcus)	% Diff Trips
Car	167360	159388	-7973	-5%
LGV	16445	16445	0	0%
HGV	9771	9771	0	0%
Total	**193576**	**185604**	**-7973**	**-4%**

6.4.6. Table 6-16 provides a comparison by model user class of the increase in overall county wide traffic for the 2036 PM assignments with and without demand adjustment compared to the 2016 base.

Table 6-16 – PM 2036 vs 2016 with and without adjustment overall totals by user class

Vehicle Type	2016 (pcus)	2026 (pcus)	Abs Diff 2026-2016	% Diff 2026-2016	2026 wAdj (pcus)	Abs Diff wAdj 2026-2016	% Diff wAdj 2026-2016
Car	122109	172295	50186	41%	164094	41985	34%
LGV	10405	13384	2979	29%	13384	2979	29%
HGV	6096	6701	605	10%	6701	605	10%
TOTAL	**138610**	**192380**	**53770**	**39%**	**184179**	**45569**	**33%**

6.4.7. The total reduction in the trip matrix within the county model as a whole is detailed in Table 6-17 for the PM 2036

Table 6-17 - PM 2036 vs 2026 with adjustment overall totals by user class

Vehicle Type	Original Trips (pcus)	Adjusted Trips (pcus)	Abs Diff Trips (pcus)	% Diff Trips
Car	172295	164094	-8201	-5%
LGV	13384	13384	0	0%
HGV	6701	6701	0	0%
Total	**192380**	**184179**	**-8201**	**-4%**

7 SUMMARY

7.1.1. This modelling methodology report has detailed the revised approach which will be undertaken to form further strategic modelling forecasts related to housing and job growth within the ISPA. A key element of these revised forecasts is a targeted demand reduction representing modal shift away from car travel which has been applied to the forecast demand. This has been applied to existing travel patterns on the basis of whether the trip is in a rural or urban location, and the distance of the trip. For the trip generation from new developments, adjustments have been made on whether the development is in an urban or rural location, and its size. The percentage reductions applied assume that there is a greater propensity to shift trips away from car travel for new housing and employment developments, compared to existing road users who are likely to have long established patterns of travel behaviour.

7.1.2. Overall the methodology leads to reduction of around -9% to -10% in terms of car travel relating to existing travel patterns within the ISPA, with significant variations around this overall figure. Ipswich has adjustments of around -15% applied to the majority of sectors which cover it, whilst more rural locations have had adjustments of between 1-5% applied.

7.1.3. Adjustments which have been made to the specific development trip generation lead to overall decreases of between 5-6%. Though again, the adjustments in Ipswich are more significant, with Ipswich-based development trips reduced by 11-13%.

7.1.4. County-wide the demand adjustments lead to a decrease of -4% when combining the existing travel patterns and specific development trip generation.

7.1.5. The strategic model will be run with the demand adjustment methodology detailed within this report applied to both the 2026 and 2036 forecasts. This revised traffic forecasts will be used to determine what the impact is on congestion and capacity issues within the ISPA. These forecasts will be used to inform further analysis on the mitigation

Appendix A

DWELLING / JOB TOTALS BY DEVELOPMENT

Appendix B

TRIP GENERATION BY DEVELOPMENT

Appendix C

DEVELOPMENT TRIP REDUCTIONS

Appendix D

ADJUSTED TRIP GENERATION BY DEVELOPMENT

WSP House
70 Chancery Lane
London
WC2A 1AF

wsp.com