

# **The Greater Norwich Development Partnership**

## **Joint Core Strategy**

Examination in Public  
November 2010

Statement of Common Ground  
between  
Norfolk County Council, Broadland District Council, South Norfolk  
District Council, Norwich City Council  
and  
The Highways Agency

### **1. Introduction**

- 1.1. This statement has been prepared by Norfolk County Council (NCC), Broadland District Council, South Norfolk District Council, Norwich City Council (the GNDP) and the Highways Agency to reflect the current position agreed by all parties with regard to the impact that the development proposals contained within the Joint Core Strategy (JCS) will have upon the Trunk Road Network, both cumulative and individually and the process and work to be undertaken, to resolve the issues raised.

It has been agreed between the parties that this statement will set out the current situation in the understanding of the impact of the Strategy on the strategic Trunk Road Network and what extra work will be undertaken to develop a greater understanding of the infrastructure delivery requirements. This information will be developed from both existing transport studies which have been prepared and a further programme of work.

### **2. Background**

- 2.1. The Trunk Road network within the Local Authority area comprises the A47 and the A11 (to the south of its connection with the A47). The Councils, as part of their duty to produce their LDFs have been in ongoing consultation with the Highways Agency regarding the impacts of the proposed JCS would have upon the safe and reliable operation of the Trunk Road Network within JCS area.

During the proposed submission period on the JCS for Broadland, Norwich and South Norfolk Document (DPD), the Highways Agency submitted representations on the spatial strategy and policies in relation to the trunk road.

2.2 The Highways Agency broadly welcomed the strategy which aims to concentrate development within the urban area, as this approach maximises sustainability potential and reduces emphasis on car use. The Highways Agency considers that development will have to be carefully planned to avoid adverse impacts on the operation of the A47/A11 trunk roads. It is likely that there will be additional congestion on the highway network. However the Highways Agency has no objection in principle to the transport policies and issues covered by the JCS, subject to appropriate mitigation measures being put in place to enable the trunk road to continue to serve its purpose as part of a national system of routes for through traffic in accordance with Section 10 of the Highways Act 1980 and to satisfy the reasonable requirements of road safety.

2.3 NCC supports the JCS to ensure the provision of appropriate transportation infrastructure and alternative modes of transport to deliver sustainable development. NCC believes it is essential that new development and necessary infrastructure is delivered in a timely way.

### **3. Matters on which the parties agree**

3.1 In broad terms all parties agree that in order to deliver the growth, there will need to be an enhancement of public transport measures in and around the Norwich growth area together with highway junction improvements to provide additional capacity.

3.2 All parties agree that there will be increased congestion impact on the A11 and A47 trunk roads as a result of the impact of the JCS. All parties agree based on the level of information appropriate for this stage of LDF development, that there appears to be feasible and technical solutions to providing the additional required infrastructure upgrades.

3.3 The Highways Agency on behalf of the Secretary of State for Transport currently has no programme for upgrading the trunk road network within the JCS area.

### **4. Modelling**

4.1 The basis for arriving at an agreed position has been predicated on the development of suitable highway impact assessment tools. Within the Norfolk the area which is represented by the Joint Core Strategy, there are a number of transport models providing an informed view of future forecast conditions on the highway network.

#### **The East of England Regional Model (EERM).**

4.2 This model has been built and is managed by the Highways Agency. It is a fully WebTAG compliant suite of models which cover the whole of the East of England and provides an indicative overview of the strategic impact on growth in the region. The model does not however provide detailed understanding of local impacts, which would be covered by more localised modelling techniques.

4.3 The Highways Agency updated its strategic understanding of the impact of forecast growth in terms of travel demand on the strategic road network in March 2010 using the most recent set of housing and employment growth forecasts to 2031 based on consultation with local authorities and the public. The output of this work set out the Highways Agency document *Draft Revision to the Regional Spatial Strategy for the East of England*, September 2010 identifies, and highlights the most stressed parts of the strategic network based on average volume over capacity ratios. Appendix A provides an extract from this document. The Full document is attached at Appendix C.

Key points: A47 Norwich Bypass:	Satisfactory Operation
A47 Dereham –Norwich	Potentially Significant Congestion
A47 Blofield – Eastwards	High levels of Congestion
A11 Wymondham- Norwich	Satisfactory Operation

The work has concluded that whilst there is likely to be increased congestion, the A47 links around Norwich should be able to cope with the additional traffic from the development areas

#### **Norwich Area Transport Strategy (NATS)**

4.4 The NATS model is more localised and detailed than EERM, focusing on the Norwich and its environs rather than the wider area. There is ongoing development of the model, partly required to ensure compatibility with latest WebTaG guidance. This model has a 2006 base year and was originally conceived to support the development of sustainable transport in Norwich and the northern distributor road (NDR). For this purpose, in December 2009 DfT at the time considered it sufficiently robust to support the Major Scheme Business Case for the NDR.

4.5 In respect to providing an evidence base to support the JCS, whilst all parties agree that the current stage of development is sufficient for the JCS stage of the LDF in understanding the likely impacts of growth on the A47 corridor.

4.6 In broad terms all parties agree that the NATS modelling confirms the outputs of the EERM model in that the A47 around Norwich should be able to cope with additional growth envisaged with the delivery of the JCS. The NATS model also highlights that all of the junctions on the A47 potentially need to be upgraded to varying degrees. This position is confirmed by the parties based on current knowledge of the operation of the trunk road network and has been reflected in the Monitoring and Implementation Framework (MIF) of the JCS.

## **5. A47 Junctions**

### **Easton Roundabout/ Longwater Interchange**

- 5.1 Currently the A47 Easton Roundabout suffers from significant congestion at peak times with tidal flows of traffic accessing Norwich. The junction links with Longwater Interchange via the local road network providing an alternative routeing for traffic. Except for times when the Norfolk Showground is in operation, the junction operates satisfactorily. The Longwater Interchange will however require enhancement to cope with committed but as yet unbuilt development. All parties agreed that additional pressures arising from growth in the JCS are unlikely to be able to be accommodated with the existing/proposed arrangements.
- 5.2 The parties are confident that suitable mitigation measures can be identified, but at this stage no information is available of the form or costings. The parties intend to work together on developing appropriate mitigations through the next stage of the DPDs.

### **Thickthorn Interchange**

- 5.3 Growth on the A11 corridor will require improvements to the Thickthorn interchange. The junction is currently near to capacity and it is unlikely that there is significant reserve capacity to accommodate additional growth in the area. The Highways Agency has been working closely with NCC on identifying suitable infrastructure changes to the Thickthorn Interchange which would provide priority for public transport measures and additional capacity to accommodate the transport impacts of the JCS. The outcomes of this work has shown there are no specific showstoppers to delivery of a scheme, subject to any statutory procedures and that it is likely that any measures would cost approximately £30m plus to deliver.
- 5.4 NCC has set up a Thickthorn Developer forum with which the Highways Agency is closely involved. This forum provides the opportunity for the promoters of growth to work closely with the highway authorities on the progress on developments and delivery of improvements.

### **Postwick Interchange**

- 5.5 Proposals for the development known as Broadland Gate together with measures to upgrade the A47 Postwick Interchange were given planning consent by Broadland District Council in December 2009. The highway improvements are detailed on drawing R1C093-R1-2011B (Rev. B)
- 5.6 The Highways Agency worked closely with NCC and developers on assessing the impact of the proposals, identification of sustainable transport measures and the deliverability of the highway junction proposals. As part of that assessment sensitivity scenarios were undertaken to assess the impact on the proposed junction upgrade of the

proposed growth set out in the JCS together with the provision of a Northern Distributor Road.

- 5.7 The Highways Agency and the GNDP are satisfied that the Postwick Hub measures in combination with robust sustainable transport measures developed through the NATS strategy will be sufficient to accommodate the growth identified in the JCS.
- 5.8 The parties agree that subject to statutory processes there are no showstoppers to delivery of the Postwick Interchange proposals. Currently, the publication of draft Highway Orders has resulted in the Orders being 'called in' and there will be a Public Inquiry; the timescale for which has yet to be determined.
- 5.9 The funding for Postwick Hub was previously confirmed by DfT in December 2009 and was provided from a £19m allocation under the Community Infrastructure Fund by the Department for Communities and Local Government. More recently, DfT have announced that Postwick will be assessed as part of its review of projects held within its 'Development Pool' list. This will look at the funding for the NDR and DfT will include Postwick within this in view of the previous funding commitment. It is expected that the funding review of the Development Pool will be completed by the end of 2011. DfT have confirmed that the Public Inquiry required to confirm the Side Road Orders for the junction improvement at Postwick can proceed, however the orders will be unlikely to be confirmed until the funding for the works has been established. The County Council and Highways Agency are currently working together to determine the best approach to commence the Public Inquiry process.

### **Other Junctions**

- 5.10 Current observations of the A47/A146 Trowse Interchange identify some queuing of traffic back onto the main carriageway at peak times due to the eastbound off slip traffic signals. All parties agree that it is unlikely that there will be a significant need for improvements to this junction arising from the scale and location of growth promoted in the JCS.
- 5.11 The current operation of the A47/B1108 Interchange is considered satisfactory. The Highways Agency has been in discussion with NCC in the past to identify and agree mitigation measures at this junction to accommodate the development of the Norwich Research Park (NRP). As the NRP master planning develops and evolves, it is likely that there may be some changes to previously identified measures. However all parties agree that the scale of these changes is such that they should not hinder the delivery of the growth set out in the JCS.
- 5.12 Current observations of traffic conditions highlight that traffic builds up on the slip roads of the A47/A140 Harford Interchange on most days, sometimes with traffic queuing back onto the eastbound mainline

carriageway. All parties agree that some changes to the junction will be required to accommodate the growth set out in the JCS, but this is likely to be limited to providing public transport priority measures on the A140 approaches and if necessary some signalisation.

## **6 Growth in the A11 Corridor**

6.1 Due to the limitations of the study area of the NATS model NCC and the Highways Agency commissioned a short study to understand the implications of growth at Wymondham on the A11 corridor (Attached at Appendix B). The study focused on junction and link operation in the morning and evening peak hours during the present year (2010) and for a future year (2026) covering the plan period for the JCS.

6.2 It should be noted that this study was limited since it did not model the potentially complex effects of congestion on travel demand, examples of such effects being trip reassignment, modal shift and trip suppression, and neither did it consider a more sustainable scenario where a reduction in vehicle trips is promoted.

6.3 The work undertaken indicates problems at the Waitrose roundabout in 2026 with and without development and at the Police HQ roundabout in 2026 with development. Significant queues on the B1172 Waitrose roundabout in theory could tailback and impact on the operation of the Police HQ roundabout. Problems at this roundabout may result in vehicles exiting the A11 northbound not being able to join the roundabout. It is however unlikely that these queues would be sufficient to affect the free flow of the A11 itself.

6.4 In summary, all parties agree with the findings of the study, that it is likely that measures to increase the capacity of the Waitrose roundabout in Wymondham may need to be implemented. It is unlikely however that the broad area of growth proposed for Wymondham in the JCS will have a detrimental impact on the operation of the A11 and there will need to be significant requirement to provide additional highway capacity on the A11 trunk road junctions.

## **7 Area wide sustainable travel planning**

7.1 Following the publication of Government Circular 02/07 the Highways Agency has an increased responsibility to lead on issues of managing demand through the introduction of sustainable transport initiatives such as area wide travel plans.

7.2 NCC are taking a lead in developing a strategy through the NATS to deliver a raft of measures in support of this objective and to minimise the need to travel and encourage travel by sustainable modes demands associated with the growth proposed in the JCS. Measures may include school/work/residential travel planning, dedicated bus priority measures,



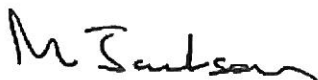
walking and cycling improvements, public transport service enhancement. All parties are supportive of delivering these initiatives.

- 7.3 It is agreed by all parties that robust demand management measures will be required to ensure that unsustainable journeys are minimised. This will be actioned through transport strategies, including developing the opportunity for bus rapid transit along key radial corridors including Wymondham being a sub-regional bus hub on the A11 corridor.

## 8 Conclusion and Further Work

- 8.1 All parties are confident that the work outlined in this statement demonstrates the soundness of the proposals as set out in the Core Strategy.
- 8.2 The GNDP is currently working with partners, including the Highways Agency, to develop a sustainable transport strategy for Norwich growth area. The aim of the strategy is to influence travel behaviour and provide alternatives to the car for many local journeys.
- 8.3 Following consideration of the proposed evidence base, the Highways Agency is in agreement with the GNDP that the transport modelling evidence base, including the NATS approach to sustainable transport, provides a broad overview of the impact of the JCS on the transport network required to identify if there are any showstoppers that could undermine the strategy and demonstrates that the impact of future development on the local trunk road network has the potential to be mitigated against and minimised to an acceptable level.
- 8.4 The GNDP and the Highways Agency also agree that the development of the Transport Evidence to support the JCS is an ongoing process that will culminate in detailed mitigation proposals, which would accompany planning applications for individual sites. Transport Assessments should be produced in accordance with Department for Transport Circular 2/2007 'Planning and the Strategic Road Network' for future proposals and projects that emerge from the JCS and subsequent documents and the parties will identify measures needed to mitigate the impact of developments as they occur on the trunk road network.

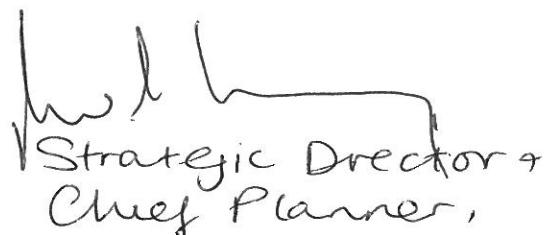
Signed on behalf of Greater Norwich Development Partnership:



Position: Director of Environment Transport and Development

Date: 16 Nov 10

Signed on behalf of The Highways Agency



Strategic Director &  
Chief Planner,

Broadland  
District Council

A handwritten signature in black ink, appearing to read "Kari Carr". The signature is fluid and cursive, with a long horizontal stroke at the end.

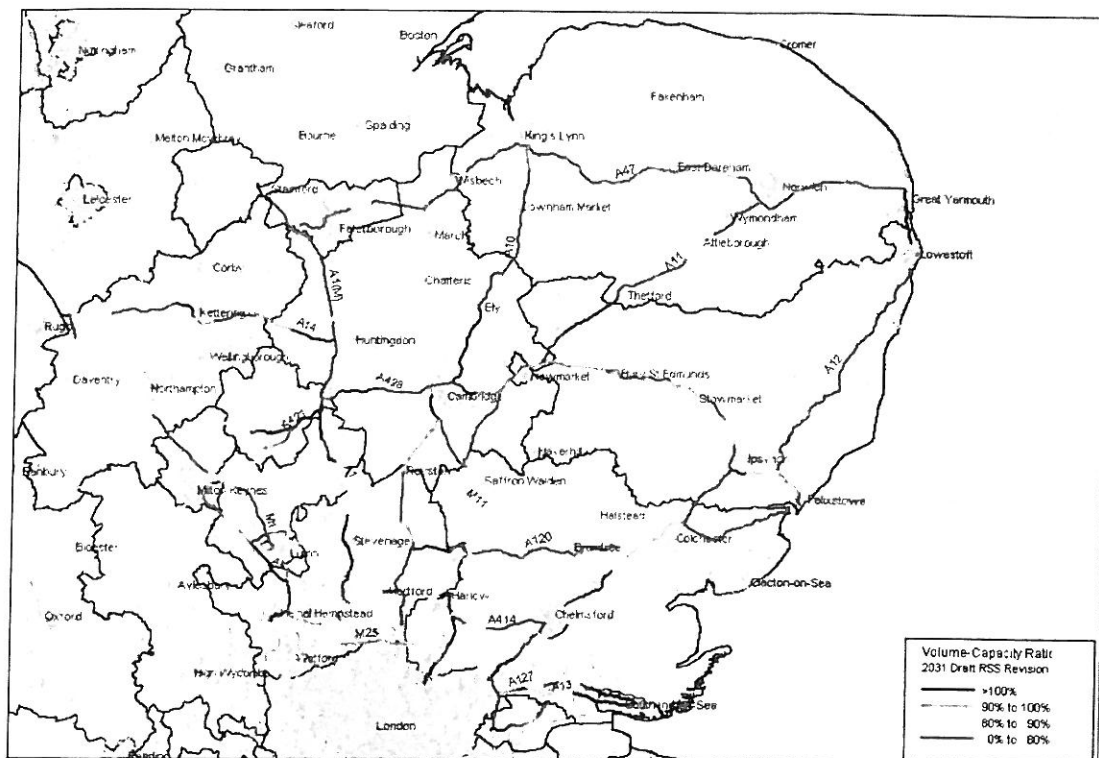
Position: Senior Network Manager

Date 12 November 2010



## Appendix A Extract from Draft Revision to the Regional Spatial Strategy for the East of England September 2010

The plan below provides an indication of likely stress levels (based on volume/capacity ratios) on the strategic road network in the East of England in 2031. The information provided has been extracted from the East of England Regional Model managed by the Highways Agency and is based on latest housing and employment datasets provided by local authorities.



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Project:	<b>HA Spatial Planning Consultancy</b>	Job No:	<b>60049654/BN536</b>
Subject:	<b>A11 Wymondham Junction Capacity Study</b>		
Made by:	<b>Monica Li</b>	Date:	<b>17/09/2010</b>
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## 1. Introduction

- 1.1 The Greater Norwich Development Partnership (GNDP) covers Broadland District Council, Norwich City Council, South Norfolk Council, Norfolk County Council and the Broads Authority to ensure that they all work together to manage the delivery of growth in the area.
- 1.2 Broadland District, Norwich City and South Norfolk Councils along with Norfolk County Council are in the process of preparing a Joint Core Strategy to manage growth in the area. This forms part of the Local Development Framework which guides how development will take place over up to 2026.
- 1.3 The Joint Core Strategy was submitted to the Secretary of State in March 2010. It is proposed to hold the Examination in Public in November 2010 with adoption set for March 2011. This Strategy identifies Wymondham as a location for a major new housing development.
- 1.4 AECOM was therefore commissioned by the Highways Agency, Norfolk County Council and South Norfolk District Council to undertake a junction capacity study of several key junctions in Wymondham in order to assess the potential impacts.
- 1.5 This Technical Note consequently provides a review of the junctions based on observed traffic flow data for 2010 which has been growthed to represent the future year of 2026.

## 2. Background

### Proposed Development

- 2.1 Policy 10 of the Joint Core Strategy identifies Wymondham as a location for major growth in the area. It goes on to state that “*at least 2,200 dwellings located in a number of sites providing easy access to local jobs, services and facilities and the town centre whilst maintaining the strategic gap to the north and northeast and the historic setting of the town and abbey*” will be provided. As part of this expansion, enhanced bus services to Norwich city centre, safe and direct cycle and pedestrian routes linking key locations, new pre-school provision and a new primary school will all be provided.

### Location

- 2.2 Wymondham is a major town located some 10km to the southwest of Norwich on the A11. It is a standalone settlement with a range of key services available and is the largest market town in the area. It offers a range of retail options and had a number of local job opportunities on several large employment areas throughout the town including at Gateway 11.

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## Road Network

2.3 The A11 Trunk Road is a key strategic route that connects the M11 motorway south of Cambridge to Norwich and forms a southern bypass to Wymondham. It is a two-way dual carriageway along its stretch in the Wymondham area. The First Points of Access to the Trunk Road are at:

- A11 / B1172 Spooner Row;
- A11 / B1135 Browick Road; and
- A11 / B1172 Harts Farm and Police HQ.

2.4 This study concentrates on the two more northern A11 junctions. In addition, the study examines the capacity of the B1135 / B1172 Norwich Road (Waitrose) roundabout as it is located in close proximity to the A11 / B1172 junction with the potential for interaction between them to affect the A11 Trunk Road.

### A11 / B1135 Browick Road junction (two roundabouts)

2.5 The Browick Road roundabouts form a dumbbell arrangement with a connecting overbridge over the A11. The western roundabout provides access to the east of Wymondham via Browick Road. The eastern roundabout provides access to smaller settlements via the B1135 Stanfield Road. Local knowledge states that there are rarely any capacity issues at this junction with regards to access to and from the A11.

### A11 / B1135 / B1172 Harts Farm junction (east side of A11)

2.6 The A11 Harts Farm junction is a four arm roundabout which connects the A11 southbound off-slip, and A11 southbound on-slip, Spinks Lane and the B1135 Harts Farm Road. Local knowledge states that there are rarely any capacity issues at this junction.

### A11 / B1135 / B1172 Police HQ roundabout (west side of A11)

2.7 This is a four arm roundabout known as the Police HQ roundabout and connects the B1172, the B1135, Falconers Chase, and the B1172 Harts Farm Road and is located some 600 metres from the A11 Harts Farm junction.

2.8 Norfolk Constabulary is located to the southwest of the roundabout with access from Falconers Chase. A Focus DIY store is located opposite Norfolk Constabulary with access from the roundabout connecting Falconers Chase and Copper Smith Way. There are also a number of business and industrial units located in this area (forming a development known as Gateway 11) all to the southwest of the Police HQ roundabout.

### B1135 / B1172 Norwich Road (Waitrose) roundabout

2.9 The Waitrose roundabout is a four arm roundabout connecting the B1135 Tuttles Lane East, the B1172 Norwich Common, the B1172, and Norwich Road and is located some 200 metres from the Police Headquarters roundabout.

2.10 Access to the Waitrose store situated to the south of the roundabout is from Norwich Road with the exit being onto the B1172. Local knowledge states that slow moving queues form on the

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B1172 during peak hours but at present these generally do not impact the overall operation of the Police HQ roundabout.

### 3. **Methodology**

- 3.1 AECOM has undertaken to determine the impacts on key junctions of providing 2,200 new dwellings in the town. In order to carry out the assessment, the assumption was made that these dwellings could be located anywhere in the town.
- 3.2 The methodology for this work consisted of the following:
- Obtain actual traffic flow data for the relevant junctions for 2010;
  - Calculate growth factors using TEMPRO and NTM for the future year of 2026;
  - Growth the traffic flow data to represent 2026;
  - Use TRICS to obtain representative trip rates and calculate trip generation;
  - Use Census 2001 journey to work data to distribute the trips onto the junctions under consideration;
  - Use actual turning count distributions to distribute the traffic at the junctions; and
  - Run ARCADY to assess junction capacity.
- 3.3 Assessments were undertaken for the base year of 2010 and the future year of 2026 to coincide with the Joint Core Strategy period.
- 3.4 It should be noted that AECOM has not undertaken an assessment of an alternative scenario and solely the 'business as usual' case has been considered. Therefore the results of the junction capacity assessments are likely to represent a worst case scenario.

#### Traffic Flow Data

- 3.5 Nationwide Data Collection was commissioned to undertake traffic counts. These were carried out on Tuesday 20<sup>th</sup> July 2010 for the AM peak (07:30-09:30) and the PM peak (16:30-18:30) for the following junctions:
- A11 / B1135 Browick Road junction (two roundabouts);
  - A11 / B1135 / B1172 Harts Farm junction (east side of A11);
  - A11 / B1135 / B1172 Police HQ roundabout (west side of A11); and
  - B1135 / B1172 Norwich Road (Waitrose) roundabout.
- 3.6 The data was collected in 15 minute intervals using multiple high mast cameras with the traffic flow being classified into light vehicles, heavy vehicles, buses, motorcycles, and pedal cycles.
- 3.7 July is not considered a neutral month for undertaking traffic counts. However, when comparing the traffic flow for July against the flow for a neutral month, the difference between the two was negligible and therefore AECOM considers the base data for July to be acceptable in this instance.

#### Growth Factors

3.8 As detailed in paragraph 3.3, a future year of 2026 has been used to coincide with the Joint Core Strategy period. It is however acknowledged that TEMPRO and NTM only currently go up to 2025. AECOM has therefore calculated the average growth rate between 2020 and 2025 in order to add on growth from 2025 to 2026 manually. The difference in growth appears to be negligible and so for simplicity and the purposes of this assessment, AECOM has used TEMPRO and NTM for 2025 without adding on the growth from 2025-2026 manually.

3.9 Table 1 shows the resulting growth factors using the urban trunk category.

**Table 1 – Growth Factors**

	AM	PM
<b>Growth factor</b>	1.2933	1.3084

### Committed Developments

3.10 No committed developments for Wymondham have been taken into account, and therefore any other growth on the network has been assumed to have been included in the background growth factors calculated.

### Trip Generation

3.11 AECOM has used the TRICS database to determine trip rates for the proposed housing using the 'Residential Private Housing' category. Sites in Greater London, Scotland, Wales and Ireland were excluded, and the number of dwellings were narrowed down to be more representative.

3.12 The trip rates used and their subsequent generation can be seen in Table 2.

**Table 2 – Trip Rates and Generation**

	AM Peak (07:30 – 09:30)			PM Peak (16:30 – 18:30)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	0.167	0.392	0.559	0.370	0.256	0.626
Trip Generation	367	862	1,229	814	563	1,377

### Trip Distribution

3.13 AECOM has derived the residential trip distribution based on a combination of Census 2001 journey to work data and onsite observations.

3.14 Census 2001 journey to work data has been used to distribute the trips generated by the 2,200 dwellings onto one of the three First Points of Access to the Trunk Road network. This was done first by identifying the Census wards which covered the town. These were taken to be:

- Abbey;
- Northfields;
- Rustens; and
- Town.



Journey to work Census data was then used to determine the work destinations of people who reside in these four wards so that distribution patterns could be developed. In order to ascertain a worst case scenario AECOM assumed all private car trips would be external. Table 3 details the general destinations of commuters.

**Table 3 – Trips distribution (Destinations)**

Predicted Traffic towards:	Percentage %
Wymondham Town	-
A11 East (Norwich, A47 E/W)	61
A11 west (Thetford, Attleborough)	38
B1135 North (Dereham, Watton)	2
B1135 South/East (Diss)	-

- 3.15 Based on the destination, all trips were assigned to the junction(s) being considered. This resulted in the distribution detailed in Table 4.

**Table 4 – Trip Distribution at the Junctions**

	Distribution (%) of proposed traffic per roundabout
<b>B1135 / B1172 Norwich Road (Waitrose roundabout)</b>	2
<b>A11 / B1135 / B1172 Police HQ roundabout (west side of A11)</b>	61
<b>A11 / B1135 / B1172 Harts Farm junction (east side of A11)</b>	31
<b>Browick Road Dumbbell Roundabout</b>	38
<b>TOTAL</b>	131% <sup>1</sup>

- 3.16 Observed turning movements were then used to determine the distribution at each roundabout.

## *A11 / B1135 Browick Road Junction*

- 3.17 Census output indicated that approximately 38% of generated traffic would have an impact on the A11 / B1135 Browick Road junction. The actual split for each of the two roundabouts (East and West) was derived from the traffic flow surveys. The results can be seen in Table 5 below

**Table 5 – A11 / B1135 Browick Road Junction Distribution**

	East %	West %
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<sup>1</sup> The total percentage is greater than 100% because vehicles are double counted at some of the roundabouts, i.e. vehicles may impact at both the Waitrose and Police HQ roundabouts.

AM Peak	56	44
PM Peak	51	49

## Junction Capacity Assessments

- 3.18 AECOM has used ARCADY to provide an overall estimation of roundabout capacity and queue lengths for the base and future scenarios at each of the five roundabouts during the morning and evening peak hours for the three scenarios listed below:
- 2010 Base;
  - 2026 Base; and
  - 2026 Base + Development.
- 3.19 The results of the ARCADY analysis should be treated with caution as they are unlikely to be totally representative of the situation on the ground for individual arms especially when the Ratio of Flow to Capacity (RFC) exceeds the 0.85 threshold that is used.
- 3.20 No information is available as to whether the proposed growth in Wymondham will result in highway improvements at any of the roundabouts being considered. Therefore, all the assessments in the future year have been undertaken with the view that the roundabouts will be the same in terms of layout and geometry as is the case at present.

**Table 6 – ARCADY 2010 Base Results**

	Arm	AM Peak (07:30 – 09:30)		PM Peak (16:30 – 18:30)	
		RFC	Q	RFC	Q
<b>B1135 / B1172 Norwich Road (Waitrose roundabout)</b>	A – B1172 Norwich Common	0.342	0.6	0.359	0.6
	B – B1172	0.439	0.8	0.746	3
	C – Norwich Road	0.276	0.4	0.406	0.7
	D – Tuttle Lane East	0.762	3	0.453	0.8
<b>A11 / B1135 / B1172 Police HQ roundabout (west side of A11)</b>	A – B1135	0.399	0.7	0.432	0.8
	B – Falconers Chase	0.051	0.1	0.287	0.4
	C – B1172 Harts Farm Rd.	0.282	0.4	0.262	0.4
	D – B1172	0.578	1	0.436	0.8
<b>A11 / B1135 / B1172 Harts Farm junction (east side of A11)</b>	A – Spinks Lane	0.000	0	0.000	0
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.096	0.1	0.088	0.1
	D – A11 Off-Slip	0.276	0.4	0.274	0.4
<b>A11 / B1135 Browick Road East</b>	A – B1135 Stanfield Road	0.206	0.3	0.310	0.4
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.189	0.2	0.111	0.1
	D – A11 Off-Slip	0.255	0.3	0.129	0.1
<b>A11 / B1135 Browick Road West</b>	A – Overbridge	0.227	0.3	0.344	0.5
	B – A11 Off-Slip	0.099	0.1	0.073	0.1
	C – Browick Road	0.246	0.3	0.199	0.2
	D – A11 On-Slip	-	-	-	-

- 3.21 Table 6 demonstrates that in the 2010 base year all Trunk Road roundabouts operate within capacity during both the AM and PM peak periods. The longest queues are of 3 vehicles on Arm B (B1172) and Arm D (Tuttle Lane East) of the Waitrose roundabout during the morning peak. These results are supported by local knowledge which states that no junction capacity issues are apparent.

**Table 7: ARCADY Base 2026 Results**

	Arm	AM Peak (07:30 – 09:30)		PM Peak (16:30 – 18:30)	
		RFC	Q	RFC	Q
<b>B1135 / B1172 Norwich Road (Waitrose roundabout)</b>	A – B1172 Norwich Common	0.494	1	0.519	1
	B – B1172	0.591	1	<b>1.044</b>	<b>54</b>
	C – Norwich Road	0.402	0.7	0.678	2
	D – Tuttle Lane	<b>1.064</b>	<b>48</b>	0.650	2
<b>A11 / B1135 / B1172 Police HQ roundabout (west side of A11)</b>	A – B1135	0.534	1	0.584	1.4
	B – Falconers Chase	0.073	0.1	0.445	0.8
	C – B1172 Harts Farm Rd.	0.379	0.6	0.384	0.6
	D – B1172	0.767	3	0.592	1
<b>A11 / B1135 / B1172 Harts Farm junction (east side of A11)</b>	A – Spinks Lane	0.000	0	0.000	0
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.126	0.1	0.115	0.1
	D – A11 Off-Slip	0.366	0.6	0.366	0.6
<b>A11 / B1135 Browick Road East</b>	A – B1135 Stanfield Road	0.272	0.4	0.414	0.7
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.245	0.3	0.145	0.2
	D – A11 Off-Slip	0.344	0.5	0.173	0.2
<b>A11 / B1135 Browick Road West</b>	A – Overbridge	0.294	0.4	0.435	0.8
	B – A11 Off-Slip	0.134	0.2	0.103	0.1
	C – Browick Road	0.329	0.5	0.271	0.4
	D – A11 On-Slip	-	-	-	-

- 3.22 In the future year with no development added, two arms of the Waitrose roundabout operate overcapacity. In the AM peak Arm D (Tuttle Lane East) registers an RFC of 1.064 and a queue of 48 vehicles; for the PM peak Arm B (B1172) indicates a queue of 54 vehicles with an RFC of 1.044. It is unlikely that queues of this length would have any impact on the A11, local authorities may however be concerned of the impact to the local road network.

**Table 8 - ARCADY 2026 + Development Results**

	Arm	AM Peak (07:30 – 09:30)		PM Peak (16:30 – 18:30)	
		RFC	Q	RFC	Q
<b>B1135 / B1172 Norwich Road (Waitrose roundabout)</b>	A – B1172 Norwich Common	0.581	1	0.631	2
	B – B1172	0.717	3	<b>1.289</b>	<b>263</b>
	C – Norwich Road	0.504	1	0.730	3
	D – Tuttles Lane	<b>1.333</b>	<b>192</b>	0.835	5
<b>A11 / B1135 / B1172 Police HQ roundabout (west side of A11)</b>	A – B1135	0.714	3	0.801	4
	B – Falconers Chase	0.107	0.1	0.765	3
	C – B1172 Harts Farm Rd.	0.399	0.7	0.614	2
	D – B1172	<b>0.986</b>	<b>22</b>	0.822	4
<b>A11 / B1135 / B1172 Harts Farm junction (east side of A11)</b>	A – Spinks Lane	0	0	0	0
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.176	0.2	0.184	0.2
	D – A11 Off-Slip	0.533	1	0.554	1
<b>A11 / B1135 Browick Road East</b>	A – B1135 Stanfield Road	0.340	0.5	0.529	1.1
	B – A11 On-Slip	-	-	-	-
	C – Overbridge	0.300	0.4	0.182	0.2
	D – A11 Off-Slip	0.441	0.8	0.223	0.3
<b>A11 / B1135 Browick Road West</b>	A – Overbridge	0.361	0.6	0.546	1.2
	B – A11 Off-Slip	0.171	0.2	0.142	0.2
	C – Browick Road	0.415	0.7	0.357	0.6
	D – A11 On-Slip	-	-	-	-

- 3.23 With development taken into account in the future year, the situation on all roundabouts worsens. Results for the Police HQ roundabout indicate that this junction will experience capacity problems in the AM Peak, however the affected arm (Arm D - B1172) will not impact on the operation of the A11.
- 3.24 The situation at the Waitrose roundabout has worsened with the addition of the development and Arm B – B1172 now sees queues of 263 vehicles during the PM peak and an RFC of 1.289. A queue of this length, spread over two lanes, will tailback to the Police HQ roundabout and may potentially impact the operation of the A11 off-slip.
- 3.25 In reality, the proposed growth will be distributed throughout Wymondham and therefore may not use the Waitrose roundabout reducing the potential impact. Additionally, before any development is granted planning permission a Transport Assessment will have to be produced which can demonstrate that the development will have nil detriment on the road network. Developers will also need to take into account demand management to try and reduce the number of vehicle trips generated through the promotion of more sustainable modes. As stated in paragraph 3.4 of this Technical Note no sustainable alternative has been assessed.

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## 4. Conclusions

- 4.1 AECOM has undertaken a preliminary study of the impact of significant growth in Wymondham as proposed by the Joint Core Strategy on key junctions. This study focuses on junction and link operation in the morning and evening peak hours during the present year (2010) and for a future year (2026) covering the plan period for the Joint Core Strategy.
- 4.2 It should be noted that this study has its limitations since it does not model the potentially complex effects of congestion on travel demand, examples of such effects being trip reassignment, modal shift and trip suppression, and neither does it consider a more sustainable scenario where a reduction in vehicle trips is promoted.
- 4.3 The work undertaken indicates problems at the Waitrose roundabout in 2026 with and without development and at the Police HQ roundabout in 2026 with development. Significant queues on the B1172 Waitrose roundabout in theory could tailback and impact on the operation of the Police HQ roundabout. Problems at this roundabout may result in vehicles exiting the A11 northbound not being able to join the roundabout. It is however unlikely that these queues would be sufficient to affect the free flow of the A11 itself.
- 4.4 In summary, it is considered that in order to support the level of growth envisaged in Wymondham that measures to increase the capacity of the Waitrose roundabout may need to be implemented alongside measures to encourage travel by more sustainable modes. However this study provides an overview to the situation and more detailed work will need to be undertaken for each of the locations where growth is envisaged.

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# Draft Revision to the Regional Spatial Strategy for the East of England



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# Draft Revision to the Regional Spatial Strategy for the East of England

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## **Executive Summary**

## Executive Summary

### Introduction

In May 2010 the government set out its commitment to abolish Regional Strategies, and for Local Planning Authorities and the Planning Inspectorate to take this into account as a material planning consideration in their decision-making process. In July 2010 the Government formally announced the abolition of the Regional Spatial Strategies, and following this began consultation on the Regional Growth Fund<sup>1</sup>.

At the time of writing, the status and likely direction of strategic planning at the regional level in light of these decisions is not known nor the impact on growth targets and regional or local distribution of growth. Assumptions on growth levels and distribution may change in light of recent events and announcements, and this may have concomitant impacts on the distribution and level of congestion on the strategic road network, other primary roads and modal share. Set against this is continuing uncertainty on funding levels, and thus the scope for soft or hard measures and interventions to address issues and impacts.

The Government's consultation document on the Regional Growth Fund set out two main objectives:

- To encourage private sector enterprise by providing support for projects with significant potential for economic growth and create additional sustainable private sector employment; and
- To support in particular those areas and communities that are currently dependent on the public sector make the transition to sustainable private sector led growth and prosperity.

The fund will make available £1 billion (2011/12 – 2012/13) to support activity with the greatest impact on sub-national growth. The fund is intended to be flexible, but could for example be used to prioritise investment in transport or housing where there are significant existing barriers to growth, to attract new employment opportunities or to prioritise investment in low-carbon and environmental sectors. Part of the fund will be available to bids that provide strategic oversight and maximise economic impacts, with bids generally expected to be over £1 million and demonstrate significant private sector leverage with longer term benefits that integrate with local planning policies, and where appropriate, national infrastructure investment. Risks need to be identified, as well as a firm evidence base that demonstrates projects will have a tangible impact. The Government is keen on the creation of local enterprise partnerships (LEPs)<sup>2</sup> and the involvement of the private sector. The deadline for bids is expected to be December 2010, with a view to decisions on successful bids by the end of February 2011. The Government expects LEPs to play a key role in many of the bids.

In early 2010 AECOM was commissioned to examine the impacts of the most recent set of planning assumptions for the East of England, as set out in the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England* (March 2010). This report analyses the results of the March 2010 'Preferred Scenario', which contains the most recent set of housing and employment growth forecasts to 2031 based on consultation with LAs and the public. It identifies the impact of forecast growth in terms of travel demand on the strategic road network, and highlights the most stressed parts of the strategic network.

---

<sup>1</sup> BIS, DCLG, HM Treasury (July 2010) *Consultation on the Regional Growth Fund* (responses due 6th September 2010).

<sup>2</sup> A White Paper is due to be published by October 2010, spelling out the powers that LEPs could be given and outlining details of the Growth Fund. Local authorities and businesses have submitted plans for LEPs in line with the 6 September deadline issued by the Government. The Government hopes that the responsibilities of the Regional Development Agencies (RDAs) will be taken on by these partnerships, which are set to be introduced in the forthcoming Decentralisation and Localism Bill.

Using the updated East of England Regional Model (EERM)<sup>3</sup>, this Report therefore provides a benchmark against which future policy changes and growth assumptions can be assessed, and to inform Local Authorities if they wish to revise growth projections and development proposals. The results of appropriate tests will help inform the development of planning scenarios at both a local and sub-regional level, and help inform co-ordination between Local Authorities, the Highways Agency and other stakeholders. They will also provide an evidence base for any applications to the Regional Growth Fund. An Independent Approved Panel will advise Ministers on allocations of the fund, and will set the strategic direction with the aim of maximising the benefit of the fund.

This provides a basis for Local Authorities and the Highways Agency to develop and test new planning and infrastructure assumptions, and to fully understand the implications of recessionary impacts on growth and funding.

Given recent developments in policy and planning, the current economic and funding climate, and changed government priorities, it is important to recognise the requirement for a strong evidence base to inform decision-making.

Some districts see growth as essential to maintain prosperity and economic activity, and Local Authorities will be able to use EERM to determine strategic impacts, inform decisions on growth scenarios, provide an evidence base for consultation, and co-ordinate with neighbouring authorities. The challenge is to find ways of facilitating growth without significant funding or investment in infrastructure, whilst addressing contemporary issues related to worklessness and social exclusion and ensuring that carbon-economy trade-offs are accounted for in decision making.

## Growth

The planning data for the Draft RSS Revision scenario is based on the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England, March 2010*. The distribution of growth within a given *district* was based on the responses, where provided, by local authorities on where they expected growth to occur. AECOM undertook this consultation in 2009 with the County Councils. In light of recent statements by the government regarding regional and local planning, it is not yet clear how and whether this might impact on those assumptions. Nevertheless, the results presented in this report are based on the most up-to date assumptions and data available to the Study Team at the time of writing.

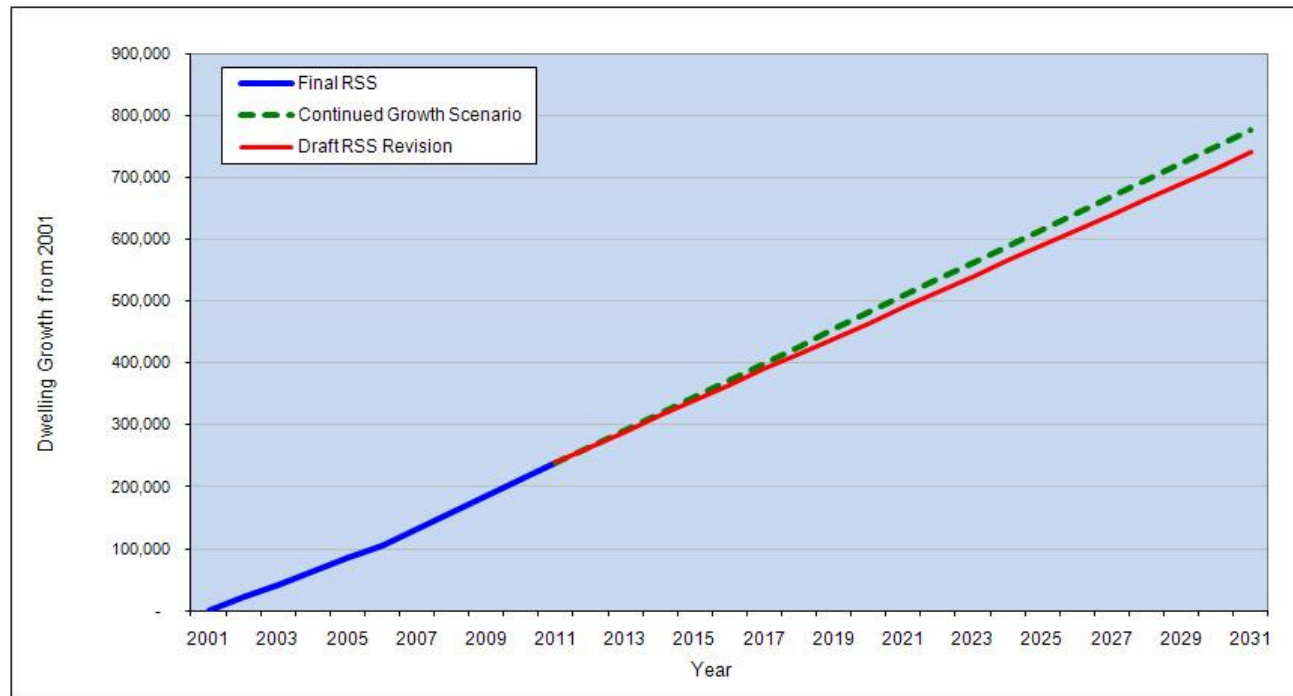
Growth is applied to a 2011 baseline (see **Figure E1**). This is based on the data available in March 2010. Since then, assumptions on housing growth 2006 – 2011 have changed, but these assumptions were not available in time for this analysis. Assumptions on employment growth and distribution 2006 – 2011 were still being revised at the time of writing. The revised forecasts for 2006 to 2011 to take into account the impacts of the recession may have a material impact on the results presented herein, and this report will need to be revised accordingly.

This extends to assumptions regarding highway, bus and rail schemes, port forecasts, and potentially revised forecasts from the DfT for LGV and HGV trips. There may also be implications regarding assumptions on passenger growth at Stansted. For the purposes of this exercise, the highway network includes core schemes as agreed with the Highways Agency in March 2010, which at the time were considered as being committed for delivery by 2031. Bus and rail networks were based on agreed definitions in January 2010, with rail assumptions drawn from DfT's PLANET model. A Stansted passenger throughput of 35 million passengers per annum (mppa) was assumed for this test.

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<sup>3</sup> Regarded by DfT as 'One of the top two transport models in the UK'.





**Figure E1:** Growth assumptions for dwelling (housing) completions per year (2011 – 2031)

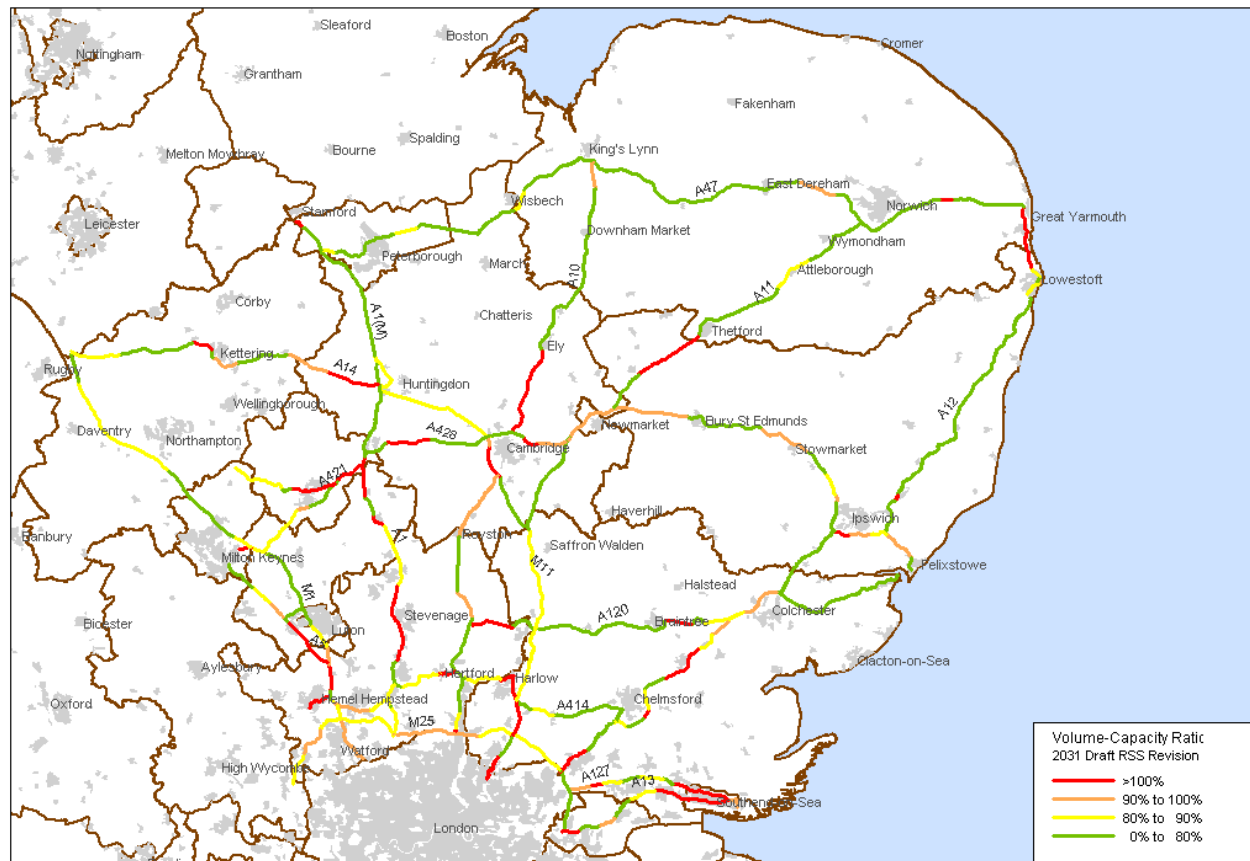
## Results

The updated planning and transport network data was used in EERM to provide revised forecasts of modal share, number of trips and congestion. There is an overall increase in person trips of 18% from 2006 to 2031. Car trips increased by 15%, LGV trips by 78% and HGV trips by 24% from 2006 levels. Rail trips increased by 137% and bus and coach trips decreased by 22%. Vehicle trips increased by 18% overall and public transport by 26%, with the latter being made up entirely of rail trips. The overall mode share for cars decreased slightly from 88% in 2006 to 85% in 2031, whilst rail mode share doubled to 4%. Nevertheless, the scale of growth on the highway network is likely to increase pressure on the road network, both at a local and regional level.

Various parts of the strategic road network and other primary roads are forecast to be heavily congested in the morning peak hour (0800 – 0900), despite delivery of a series of network improvement schemes, due to the scale of housing and employment growth over the 20-year period from 2011 to 2031, as shown in **Figure E2**.

Some of the key routes with high congestion include:

- A428/A421 between Bedford and A1;
- Part of the A1 between Welwyn Garden City and St Neots;
- M1 between Junction 8 and Junction 9;
- A10 between Cambridge and Ely;
- A11 between Newmarket and Thetford;
- A127 between Basildon and Southend-on-Sea;
- A13 between Basildon and Southend-on-Sea;
- M11 between Junction 6 and Junction 7; and
- A12 between Great Yarmouth and Lowestoft.



**Figure E2: East of England Regional Model (EERM): 2031 Morning Peak Hour (0800 – 0900) Volume/Capacity Ratios on Strategic Road Network and Other Primary Roads**

### Next Steps

The abolition of the RSS leaves in place the currently adopted development plan documents applicable to each district, with local authorities deciding how many new homes they need and where they should be located. Depending on when these plans were adopted, the Development Plan Documents (DPDs) will in effect implement RSS policies, and so there may be little material impact on targets in the short term. However, where local planning authorities wish to amend targets, and potentially to refuse planning applications on that basis, they may need to amend their DPDs and provide a firm evidence base for revising previously set allocations and growth. This may become particularly important in the case of local appeals and the involvement of the Planning Inspectorate, especially if the possible vacuum between the RSS and local strategies remains unaddressed.

Various authorities across the East of England have identified issues regarding the state and quality of housing, whether owner-occupied or rented, and in both the private and social housing sectors. Concomitant with this has been the identification of a lack of affordable housing, but in many cases policies to address these have been based on assumptions on the delivery of overall targets for housing. Policies regarding social exclusion, educational attainment, worklessness, and accessibility will therefore be drawn more strongly into the new localism agenda.

Given the effort involved in the last few years in incorporating RSS targets and policies, there will need to be a robust process and mechanism in place to change or reallocate growth at the sub-regional level, and understand the implications (see **Figure E3**). Irrespective of any changes, cuts in funding are likely to curtail many of the programmes, such as transport, water, sewage and energy infrastructure, required for

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graph TD
    A[RSS Mar 08] --> B[RSS Review Sep 09]
    B --> C[RSS Revision Preferred Scenario Mar 10]
    C --> D[Revised RSS Benchmark]
    E[Recessionary Impacts: Revised housing & employment forecasts 2006-2011] --> F[Post-RSS Scenarios]
    D --> F
    F --> G[Local, Sub-regional & Regional Impacts. Cross-boundary Impacts.]
    F --> H[LDF and Preferred / Core Strategy DPD Scenarios. Funding bids e.g. Regional Growth Fund]
    I[Revised HH & emp. forecasts. Revised local distributions. Revised interventions/schemes.] --> H
    J[Congestion, Stress & Delay Modalshift  
Environment: Carbon & Air Quality  
Funding: Fiscal Uncertainty  
Behavioural Change & Smarter Choices  
Accessibility & Mobility  
Social Inclusion  
Affordable Housing  
Employment & Worklessness  
Education  
Health  
Regeneration] --> H
    K[Local and regional LA, HA, LEP & stakeholder discussion, consultation and agreement] --> H
    G --> L[Revised local & sub-regional targets, strategies & policies]
    H --> L
    J -.-> L
  
```

The flowchart illustrates the RSS Review process. It begins with 'RSS Mar 08', followed by 'RSS Review Sep 09', and 'RSS Revision Preferred Scenario Mar 10'. This leads to the 'Revised RSS Benchmark'. A 'Recessionary Impacts' box (purple) also feeds into 'Post-RSS Scenarios' (orange). From 'Post-RSS Scenarios', the process branches into 'Local, Sub-regional & Regional Impacts. Cross-boundary Impacts.' (orange) and 'LDF and Preferred / Core Strategy DPD Scenarios. Funding bids e.g. Regional Growth Fund' (light blue). The latter is further informed by 'Revised HH & emp. forecasts. Revised local distributions. Revised interventions/schemes.' (purple) and a large purple box listing various issues: 'Congestion, Stress & Delay Modalshift', 'Environment: Carbon & Air Quality', 'Funding: Fiscal Uncertainty', 'Behavioural Change & Smarter Choices', 'Accessibility & Mobility', 'Social Inclusion', 'Affordable Housing', 'Employment & Worklessness', 'Education', 'Health', and 'Regeneration'. A light blue box for 'Local and regional LA, HA, LEP & stakeholder discussion, consultation and agreement' also feeds into this stage. Finally, both the 'Local, Sub-regional & Regional Impacts' box and the 'LDF and Preferred / Core Strategy DPD Scenarios' box lead to 'Revised local & sub-regional targets, strategies & policies' (blue). A dashed arrow also connects the large purple box to this final outcome.

Local planning authorities should continue to develop Local Development Framework (LDF) core strategies and other DPDs. In doing so, they will continue to have regard to the development plan but also national policies, and may continue to use the evidence that informed the preparation of the Regional Strategies<sup>4</sup>. In any case, the Highways Agency will continue to play an important role, as they assess the impacts of local developments on the strategic road network, and in ensuring that EERM is used to inform strategic planning, option development and decision-making during and after this transition period. The following list includes key considerations and issues:

- <sup>4</sup> Of which EERM was one of the key components.

AECOM should ensure continuing collaboration with and between local authorities. This includes neighbouring authorities in London, the East Midlands and the South East.

- Land use planning and transport policy need to be closely aligned and complementary.
- There is merit in updating the benchmark test in this Report with the latest data available to take into account recessionary impacts on current and forecast growth.
- Some authorities may decide to retain their existing targets, whilst others may seek to revise them. There are benefits in undertaking assessments that examine impacts on the entire main road network, including major roads that do not form part of the Highways Agency's Strategic Road Network.
- The environmental impact of policies must be considered, including the carbon emissions from transport under different planning scenarios.
- Interventions may have wider economic benefits that are not currently assessed in appraisal, and which may need to be considered in order to fully understand the case for and against different interventions. This may be essential to make the case for funding or ensure significant private sector involvement. The probability of success within any given region or sub-region will be highly dependent on the ability of local authorities and other stakeholders to work together.
- Local Authorities, the Highways Agency, and relevant stakeholders including Chambers of Commerce, businesses and the third sector, will need to think about how they can use the existing tools and evidence base to create coherent packages of projects that can draw on alternative sources of funding, including but not limited to the Regional Growth Fund, or create innovative funding and financing arrangements suited to local needs. The Government is likely to encourage local enterprise partnerships to play a key role.
- The relationship between transport and the achievement of goals associated with housing, employment, social inclusion, accessibility and health should be further explored.
- The role of smarter choices and mechanisms to influence travel behaviour may be more cost-effective in addressing congestion and meeting carbon reduction targets. As noted in results for the Sustainable Travel Towns Programme, the programme offered excellent value for money, and the largest contribution to reduced traffic volumes and carbon emissions may come from changes to medium and longer distance journeys.

## Introduction

# 1 Introduction

## 1.1 Introduction

The Secretary of State published the final version of the East of England Plan in May 2008, when it became the statutory development strategy (also referred to as the Regional Spatial Strategy, or RSS) for the region covering the period 2001-2021. AECOM have undertaken various studies for the Highways Agency during the transition from the Draft East of England Plan to the final version, and have undertaken a number of sensitivity tests of subsequent reviews of the final version of the plan, both in terms of planning and infrastructure assumptions. The status of the regional strategies and planning was recently reviewed by the government, resulting in the decision to abolish the regional strategies. This report therefore provides a benchmark against which Local Authorities (LAs) and the Highways Agency can develop and test new planning and infrastructure assumptions, and to fully understand the implications of recessionary impacts on growth and funding.

In 2009 the East of England Regional Assembly (EERA) commenced a review of the East of England's development needs for the period 2011-2031, testing the implications of a range of scenarios to assist in the development of options to inform the scale and distribution of growth up to 2031. Four scenarios were tested with varying levels of housing and employment forecasts in line with the Government's advice for the East of England region for the next 20 years.

Subsequent to the testing of the four growth options in 2009, EERA published the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England*, in March 2010. This included the 'preferred scenario', a revised set of housing and employment growth forecasts following consultation with both the Local Authorities as well as the public, on the likely growth levels envisaged over the 20 year period.

AECOM has undertaken a test using the updated East of England Regional Model (EERM2), based on infrastructure schemes that had been allocated funding by the Department for Transport (DfT) and therefore committed for delivery to 2024, with the assumption that no further schemes are delivered to 2031, thus excluding schemes whose delivery is affected by a high level of uncertainty. The status of what were considered committed schemes and funding from the Regional Funding Allocation envelope is itself now subject to uncertainty.

This report analyses the results of the March 2010 'Preferred Scenario', which contains the most recent set of housing and employment growth forecasts to 2031 based on consultation with LAs and the public. It identifies the impact of forecast growth in terms of travel demand on the strategic road network, and highlights the most stressed parts of the strategic network.

In May 2010 the government set out its commitment to abolish Regional Strategies, and for Local Planning Authorities and the Planning Inspectorate to take this into account as a material planning consideration in their decision-making process<sup>1</sup>. In July 2010 the Government formally announced the abolition of the Regional Strategies<sup>2</sup>.

The results in this Report already take into account assumptions on the distribution of growth as provided by Local Authorities in 2009 when AECOM undertook a consultation exercise across the region, within the context of absolute targets set at a regional level. At the time of writing, the status and likely direction of strategic planning at the regional level is not known nor the impact on growth targets and regional or local distribution of growth. Assumptions on growth levels and distribution may change in light of recent events and announcements, and this may have concomitant impacts on the distribution and level of congestion on the strategic road network, and local and regional priorities.

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<sup>1</sup> Letter from Eric Pickles, Secretary of State for Communities and Local Government, to planning authorities, dated 27 May 2010.

<sup>2</sup> Letter from The Chief Planning Officer, DCLG, to planning authorities, dated 6 July 2010



## 1.2 Context

In July 2010 the Government formally announced the abolition of the Regional Strategies<sup>3</sup>, and following this began consultation on the Regional Growth Fund<sup>4</sup>. This Report provides a benchmark against which future policy changes can be assessed, in particular as the government implements changes to the framework for regional planning, and if local authorities wish to look at revising growth projections and development proposals. The results of appropriate tests will help inform the development of planning scenarios at both a local and regional level, and help inform co-ordination between Local Authorities, the Highways Agency and other stakeholders, particularly in light of the government's invitation to local authorities and business leaders to submit proposals on forming new local enterprise partnerships (LEPs)<sup>5</sup>.

EERM has the ability to assess interactions and network stress conditions throughout the region, as well as the capability to assess carbon emissions. This provides the capability to reflect changes in growth aspirations and assess their impacts, whether in terms of absolute levels, spatial distribution or timing.

Given recent developments in policy and planning, the current economic and funding climate, and changed government priorities, it is important to recognise the requirement for a strong evidence base to inform decision-making. Current conditions provide the Highways Agency and Local Authorities with a unique opportunity to revisit how growth should be structured and delivered. However, it is essential to stress that there are interactions across the region and with other regions, and the impacts of different population and employment projections within a district or county will have impacts on other authorities. The view of growth and how it should be accommodated varies across the region. Furthermore, the role of LEPs will need to be clarified, as well as the mechanisms for securing private sector involvement and finance in delivery programmes and constructing bids for government funding, for example from the Regional Growth Fund, which is likely to be highly competitive and require high quality bids within tight timescales.

Some districts see growth as essential to maintain prosperity and economic activity, and Local Authorities will be able to use EERM to determine strategic impacts, inform decisions on growth scenarios, provide an evidence base for consultation, and co-ordinate with neighbouring authorities and the business sector. The challenge is to find ways of facilitating growth without significant funding or investment in infrastructure, whilst addressing contemporary issues related to worklessness and social exclusion and ensuring that carbon-economy trade-offs are accounted for in decision making.

## 1.3 Background

EERA published the Draft East of England Plan for consultation on 8 December 2004. Thereafter, AECOM (then Faber Maunsell) carried out a study on behalf of the Highways Agency to help assess the implications of the plans and policies set out in the report, particularly the impact on the operation of the strategic road network. This study included development and use of the East of England Model (EoEM), and the results were reported in May 2005.

After a period of consultation, the Draft East of England Plan Examination in Public (EiP) was held between November 2005 and March 2006, and the Panel Report was published in June 2006. AECOM was then asked to undertake a test to examine the impact of the higher level and revised distribution of development

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<sup>3</sup> *ibid.*

<sup>4</sup> BIS, DCLG, HM Treasury (July 2010) *Consultation on the Regional Growth Fund (responses due 6th September 2010)*.

<sup>5</sup> The Government received proposals for local enterprise partnerships from across the country in early September 2010.

proposed in the Report. The future year network specification was also revised from that used in the initial Draft East of England Plan tests to include only schemes given Regional Funding Allocation (RFA) and those in the Highways Agency's Targeted Programme of Improvements (TPI), and the results of this analysis were reported in December 2006.

Another period of consultation followed release of the Panel Report, based on which the Secretary of State announced proposed modifications to the East of England Plan shortly before Christmas 2006.

Between 2006 and 2008 AECOM developed an enhanced version of EERM, through a series of changes and updates, called the East of England Regional Model (EERM), based on EoEM and the Regional Highway Routeing Model (RHRM). The latter was built on behalf of BAA for use in evaluating proposals for surface access to an expanded Stansted Airport. Although the first revision of EERM was made available in 2007, ongoing refinements resulted in the release of Version 1.3 (EERM v1.3) in 2008.

On 12 May 2008, the Secretary of State published the final version of the East of England Plan. This revision included updated job and housing growth forecasts. AECOM undertook a test using EERM v1.3 to examine the changes in predicted stress levels in 2021 on the East of England strategic road network recorded in migrating from the Proposed Modifications test to the Final Plan ('East of England Plan Proposed Modifications Test: Comparison of Results from the East of England Regional Model Proposed Modifications Test to the Final Plan' December 2008).

Subsequent to this, AECOM undertook two further model runs for different growth scenarios to 2031. The first test rolled forward the East of England Plan (RSS) growth forecasts from 2021 to 2031. The second test assumed higher growth rates to 2031, as well as a higher forecast passenger throughput at Stansted Airport, assuming a second runway is built.

Following the release of a second round of Regional Funding Allocation (RFA2) in 2008/09 for transport schemes covering the years 2009/10 to 2018/19, AECOM performed another model run based on the East of England Plan growth forecasts rolled forward from 2021 to 2031 with schemes given RFA2 funding.

In September 2009 EERA published the *East of England Plan 2031: Scenarios for Housing and Economic Growth, Consultation September 2009*, and AECOM were commissioned to test and analyse the implications of the four different growth scenarios described in the document.

Following this, the region published the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England* in March 2010 with revised growth figures. AECOM were asked to test and analyse the impacts of these growth figures.

Since reporting on the September 2009 consultation, AECOM has developed a revised version of the model (EERM2), which has been used in the analysis for this study. This report reflects the assumptions made for population and employment forecasts for the East of England in the March 2010 consultation scenario, hereinafter referred to as the '*Draft RSS Revision*', and the assumptions on committed highways schemes to 2024, as known and agreed with the Highways Agency in March 2010.

## **1.4 Structure of this Report**

Following this introductory chapter, this Report is structured as follows:

- Chapter 2 provides a brief background to EERM and the model study area, and the various components of the model relevant to producing the model run outputs that form the basis of the results presented herein.
- Chapter 3 describes the specification of the growth scenario, in terms of population and economic growth forecasts, and network assumptions.
- Chapter 4 provides an overview of the model results at a strategic level.
- Chapter 5 analyses the results of the current growth scenario on the strategic road network.
- Chapter 6 provides a summary of the main findings and conclusions, and the next steps.

## **East of England Regional Model 2 (EERM2)**

## 2 East of England Regional Model 2 (EERM2)

EERM was developed primarily from RHRM, along with improvements made to EoEM during the life of RHRM. Overall, the model is compliant with the Variable Demand Modelling Advice (VaDMA) published by the DfT.

The EERM model comprises a suite of components as outlined in **Table 1**.

**Table 1: EERM Components**

Component		Purpose
EERDM	East of England Regional Demand Model	Based on the pattern of development across the East of England, forecasts the future patterns of the Region's travel demand by mode, time and source of growth, reflecting the performance and capacity of the transport infrastructure. EERDM is also the means of estimating demand responses of travellers to changes in the transport system.
EERHAM	East of England Regional Highway Assignment Model	Forecasts route choice for highway traffic through and within the Region.
EERBAM	East of England Regional Bus Assignment Model	Combines forecasts of the pattern and level of interurban bus and coach demand with details of the service patterns to establish generalised journey time changes for input to EERDM.
PLANET	Department for Transport Rail Model	Applies forecasts of the pattern and level of rail demand to establish generalised journey time changes for input to EERDM.

Various EERM versions have since been produced due to opportunities taken to update the model and improve model sensitivity, leading to EERM v1.3 which was used to test the Final East of England Plan.

There has recently been an update to the EERM model, thus producing EERM v2 (EERM2), which includes updates to the whole suite of model components. EERM2 has a revised calibrated and validated base year (2006) and various network enhancements, namely:

- The network detail has been improved to ensure that all B-roads and some additional unclassified roads are represented providing a consistent coverage and detail across the East of England, these changes being most noticeable in Norfolk and Suffolk;
- A thorough review of junction coding (785 junctions were reviewed as part of the EERM2 development, consisting of all A-roads east of the A12, north of the A14, and in the area bounded by the M1, M25, A13 and A406);
- Traffic signal timings were reviewed and adjusted to match those in the base year;
- Updates of speed/flow curve parameters were undertaken in line with latest guidance (including revision of curves representing rural D4, D5, D6 lane Motorways);

- Change in average fixed link speeds were implemented in urban North London; and
- Infrastructure improvements/additional schemes between 2003 and 2006 were included.

EERM is well respected and has been used to underpin the evidence base for various studies, to help inform planning policy and to support the assessment of several trunk road improvements through Public Inquiry. EERM has been reviewed by DfT and is considered a fully WebTAG compliant model. It has been used to inform regional reviews as well as numerous Local Development Frameworks, helping to provide guidance on the impacts of development and associated network stress through varying planning and infrastructure assumptions. It has provided an evidence base to assess the impacts of planning policy and schemes and to inform prioritisation of interventions.

The EERM study area includes Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk and Peterborough, as well as coverage within other areas such as London, the South East and the East Midlands.

Considering the above, EERM is the strategic transport modelling tool for the area, providing quantified evidence for a wide range of applications.

The DfT Regional and Local Strategic Modelling and Appraisal Capability (September 2009) confirmed EERM as “*highly compliant with current WebTAG and DMRB guidance*” and “*EERM is suitable for strategic analysis of road interventions, some large-scale or widespread public transport interventions, and for the appraisal of area-wide road pricing schemes*”.

## **Specification for 2031 Scenario**

## 3 Specification for 2031 Scenario

### 3.1 Planning Data

The planning data for the Draft RSS Revision scenario is based on the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England, March 2010*. The draft revision to the RSS required the Plan to extend its coverage to 2031 to make provision for the East of England's development needs for the period 2011 to 2031. EERA initially set out four different housing and economic growth scenarios for consultation in September 2009. Following consultation, EERA published the 'preferred scenario' albeit different from the previous four scenarios consulted upon, with potential implications on the operation and performance of the strategic road network. The impacts of this scenario have now been tested and the results presented within this report.

It should be noted that the key demand driver is population, rather than employment, in terms of trip rate production. Previous work has indicated that changes in housing and employment forecasts do not have concomitant impacts on trip levels. The key driver tends to be changes in population and the assumptions on the breakdown of the population by socio-economic group. This breakdown of socio-economic group is based on TEMPRO (version 5.4 for this test). Employment determines the relative attractiveness of areas (model zones).

Freight assumptions are not affected by the review and remain constant for a particular year as they are based on the DfT's National Transport Model (NTM). However, in reality this may vary with different population and employment levels, which affect the demand for goods. A Stansted passenger throughput of 35 million passengers per annum (mppa) has been assumed for this test.

The *distribution* of growth within a given *district* is based on the responses, where provided, by local authorities on where they expected growth to occur. This consultation took place in 2009 with the County Councils. In light of recent statements by the government regarding regional and local planning, it is not yet clear how and whether this might impact on those assumptions. Nevertheless, the results presented in this report are based on the most up-to date assumptions and data available to the Study Team in May 2010.

Growth is applied to a 2011 baseline. This is based on the data available in March 2010. Since then, assumptions on housing growth 2006 – 2011 have changed, but these assumptions were not available in time for this analysis. Assumptions on employment growth and distribution 2006 – 2011 were still being revised at the time of writing.

Both supply and demand assumptions, in terms of population and housing growth and transport infrastructure, are different from those in used in previous RSS scenarios tested, and therefore the results are not directly comparable.

### 3.2 Network Assumptions

The highway network includes Core schemes, as agreed with the Highways Agency in March 2010, which are committed for delivery by 2031. The schemes are listed in **Appendix A**. All such schemes were in fact programmed for delivery by 2024.

The EERM bus and rail networks are based on the agreed definitions in January 2010. Rail assumptions were based on the DfT's PLANET model, with outputs provided for EERM in December 2009. This includes schemes committed to 2026. The bus network was based on the 2007 base network, with additional committed services included where information was made available by the relevant Local Authorities by January 2010.

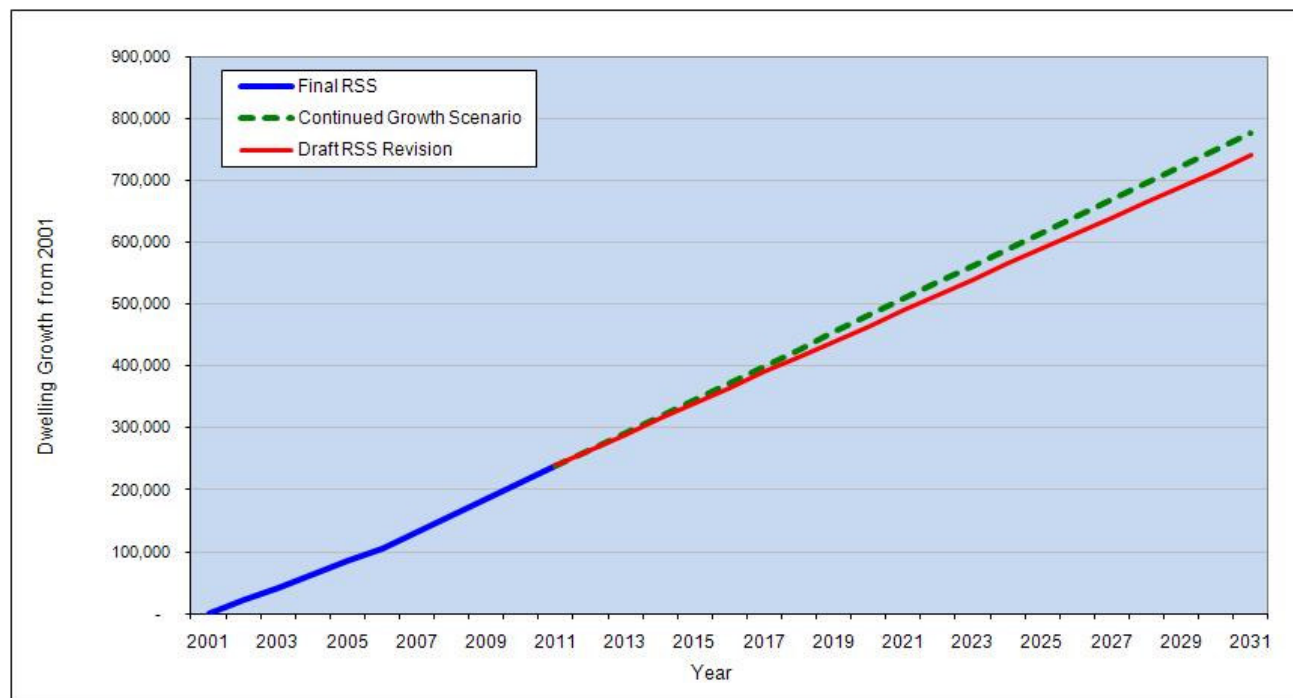


### 3.3 The Growth Scenario

The following section provides details of the growth scenario, based on the Draft RSS Revision, and includes a breakdown by district and county.

**Figure 1** shows the differences in growth to 2031 between the Draft RSS Revision scenario and the previously tested Continued Growth scenario<sup>1</sup> (see 'East of England Final Plan: Implications of Continued Growth and Higher Growth scenarios for 2031', May 2009). The number of dwellings required by the Draft Revision is more conservative than the Continued Growth scenario given the current economic climate and its predisposition towards sluggish growth in most industries. As a result, growth in dwellings by the year 2031 in the Draft RSS Revision scenario is 5% less than growth in the Continued Growth scenario.

At the time of writing, assumptions on growth 2006 – 2011 were under review. This will have an impact on overall growth for the region, and therefore a concomitant impact on congestion and stress level reported here.



**Figure 1:** Growth assumptions for dwelling (housing) completions per year (2011 – 2031)

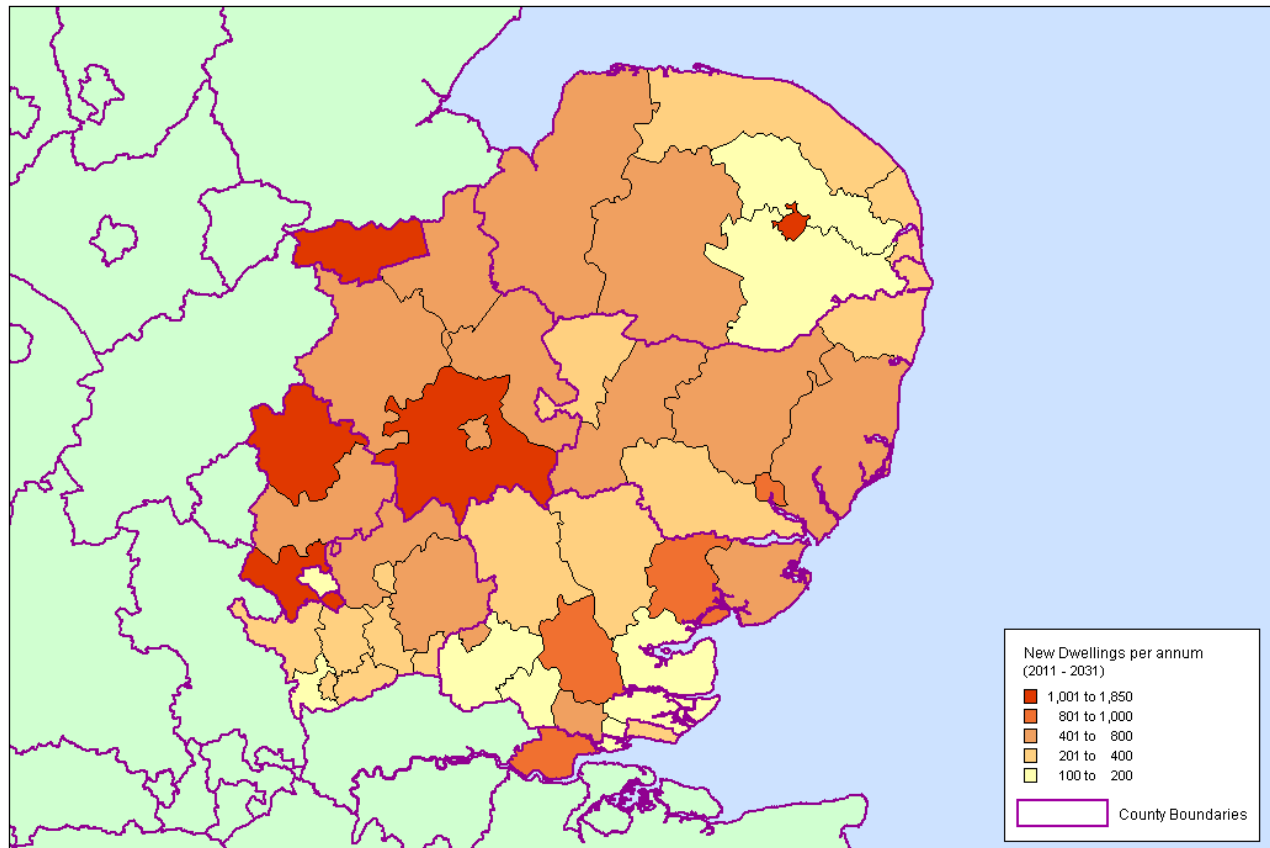
**Table 2** show the distribution in housing and job growth respectively for the Draft RSS Revision from 2011 to 2031 by district.

<sup>1</sup> Draft RSS Revision scenario has slightly lower growth than the previously tested Continued Growth scenario, as the Draft RSS Revision takes into account recessionary impacts 2008 – 2011, with an assessment from some County Councils that they could not provide growth at the roll forward rate.

**Table 2: Housing and Job Allocation from 2011 to 2031 by District**

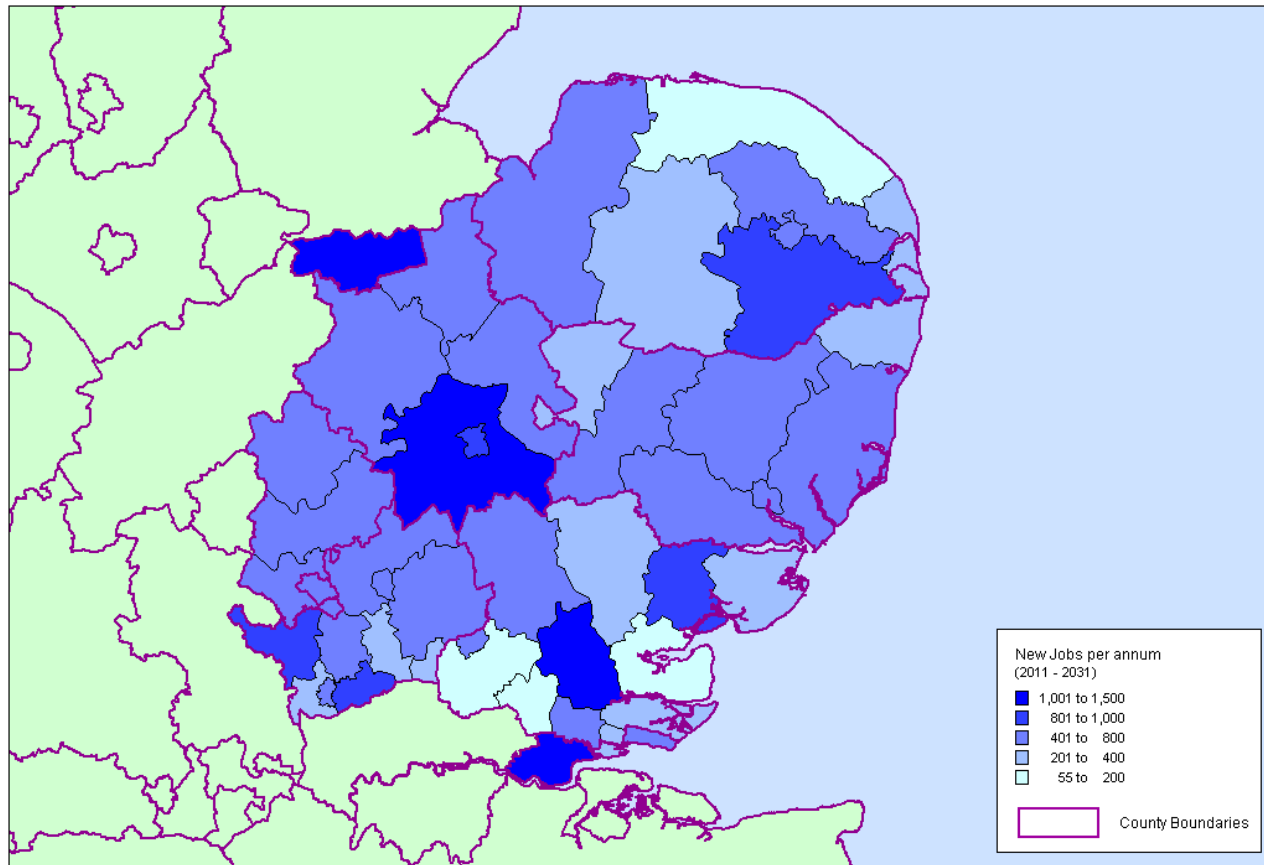
District	Indicative net additional dwellings (2011-2031)	Indicative net additional jobs (2011-2031)
Bedford		15,000
Central		23,000
Luton		14,000
<b>Bedfordshire</b>	<b>64,500</b>	<b>52,000</b>
Cambridge City	14,000	20,000
East	11,000	11,000
Fenland	11,000	8,600
Huntingdonshire	11,000	10,800
South	21,000	21,200
Peterborough	28,600	30,000
<b>Cambridgeshire</b>	<b>96,600</b>	<b>101,900</b>
Basildon	10,700	12,000
Braintree	6,600	5,900
Brentwood	3,400	3,700
Castle Point	4,000	4,500
Chelmsford	16,600	23,500
Colchester	16,800	18,000
Epping Forest	3,200	3,600
Harlow	16,000	8,100
Maldon	2,300	4,000
Rochford	3,800	7,000
Tendring	8,600	7,000
Uttlesford	8,000	9,200
Southend-on-Sea	6,000	12,000
Thurrock	18,500	30,000
<b>Essex</b>	<b>124,500</b>	<b>148,500</b>
Broxbourne	5,100	6,200
Dacorum	6,100	16,500
East	11,000	13,600
Hertsmere	5,000	17,900
North	15,800	9,000
St Albans	7,000	11,400
Stevenage	6,400	11,400
Three Rivers	4,000	4,300
Watford	5,100	10,700
Welwyn Hatfield	5,800	7,100
<b>Hertfordshire</b>	<b>71,300</b>	<b>108,100</b>
Breckland	12,800	6,900
Broadland	2,000	10,000
Great Yarmouth	5,000	5,000
King's Lynn &	13,100	11,600
North Norfolk	6,600	1,100
Norwich	37,000	12,100
South Norfolk	3,000	17,900
<b>Norfolk</b>	<b>79,500</b>	<b>64,600</b>
Babergh	6,700	9,700
Forest Heath	6,800	6,600
Ipswich	17,000	14,000
Mid Suffolk	8,500	11,100
St Edmundsbury	10,800	13,600
Suffolk Coastal	8,700	11,700
Waveney	5,800	5,000
<b>Suffolk</b>	<b>64,300</b>	<b>71,700</b>
<b>East of England</b>	<b>500,700</b>	<b>546,500</b>

**Figure 2** shows the distribution of dwelling (housing units) growth per annum by district from 2011 to 2031, for the Draft RSS Revision. The distribution of growth within a district is based on information provided by Local Authorities in 2009 when AECOM undertook a consultation exercise across the region.



**Figure 2:** New Dwellings by District per annum, 2011 - 2031

**Figure 3** shows the distribution of additional jobs per annum by district from 2011 to 2031, for the Draft RSS Revision. The distribution of growth within a district is based on information provided by Local Authorities in 2009 when AECOM undertook a consultation exercise across the region.



**Figure 3:** New Jobs by District per annum, 2011 - 2031

## Results

## 4 Results

### 4.1 Introduction

This chapter summarises the overall results of the Draft RSS Revision scenario. The following chapter discusses the findings. Appendix B provides a glossary and definition of key terms used in this and the following chapter. The Draft RSS Revision included a revised set of housing and employment growth forecasts at a reduced rate from the current East of England Plan (RSS). Where appropriate, this has been compared against EERM 2006 base year figures to provide context for the level of growth envisaged over the next twenty years.

### 4.2 Trips

**Table 3** compares demand forecasts for the 12-hour period incorporating morning peak (0700 – 1000), inter-peak (1000 – 1600) and evening peak (1600 – 1900) in 2006 and the Draft RSS Revision. **Table 4** compares the difference in demand from 2006 to 2031 in the Draft RSS Revision.

There are 1.9 million (18%) more trips in 2031 (Draft RSS Revision) than in 2006, consisting of 1.4 million (15%) more car trips, 356,000 (78%) more LGV trips, 35,000 (24%) more HGV trips, and 264,000 (137%) more rail trips. There are 96,000 (22%) fewer bus and coach trips. Only longer distance bus and coach trips are represented within EERM (local services are not represented). There are a combination of factors that could result in a decrease in longer distance bus and coach trips: decreasing car costs *relative* to bus and coach costs; an assumption that people will value quicker journey times in the future more than they do now (hence favouring quicker modes, such as car or rail, even if more expensive in absolute terms); and changes in trip destinations to areas which are better served by other modes. Clearly, changes in development plans and policy decisions could result in longer distance bus and coach services being implemented to better serve future needs.

The increase in LGV and rail trips from 2006 to 2031 is particularly noticeable, equating to an average annual growth rate of 2.3% and 3.5% respectively. LGVs almost double in volume, whilst rail trips more than double. Overall, there is a significant increase of 18% in total trips forecast in the region from 2006 to 2031, including LGVs and HGVs.

Total forecast LGV and HGV trips are unaffected by planning data assumptions and the scale of network improvements and interventions. This is because the freight growth assumptions are based on DfT's National Transport Model (NTM) forecasts, in line with DfT guidance, which forecast freight nationally.

In terms of overall mode share between 2006 and the Draft RSS Revision, the proportion of trips by each mode remains broadly similar. The proportion of car trips has reduced slightly (from 88% to 85%) whereas the proportion of rail trips has doubled (from 2 to 4%).

**Table 3:** Twelve-Hour Demand Forecast for all Person Trips with Origin in the East of England Area

EERM Draft RSS Core Including Schemes Committed to 2024				
	2006		2031 Draft RSS	
Mode	Trips	Mode share	Trips	Mode share
Car	9,124,448	88%	10,477,863	85%
LGV	456,396	4%	812,743	7%
HGV	145,731	1%	180,328	1%
Rail	192,294	2%	456,174	4%
Bus	443,196	4%	347,121	3%
<b>Total</b>	<b>10,362,064</b>	<b>100%</b>	<b>12,274,228</b>	<b>100%</b>

**Table 4:** Difference in 12-Hour Demand for Person-trips with Origin in the East of England: 2031 Draft RSS Revision Compared to 2006 Base Year

Mode	Draft RSS Core - 2006
Car	15%
Rail	137%
Bus	-22%
<b>Total (excl. LGV and HGV)</b>	<b>16%</b>

### 4.3 Changes in network utilisation

In terms of network stress, **Table 5** presents volume/capacity ratios on various strategic network routes for the morning peak hour (0800-0900) in 2031. The table shows the maximum congestion for each road section and therefore enables the most significant bottlenecks to be identified.

**Figure 4** displays the maximum volume/capacity ratios for the morning peak hour in the Draft RSS Revision scenario on the strategic road network and some other primary roads, to help identify the locations where traffic flows are forecast to exceed capacity. Note that each section of the road network in the maps may consist of several modelled links (for example, at least two links are required for two-way roads, one for each direction), and the maps display the highest volume/capacity ratio (VCR) of the modelled links that make up a section of road displayed in the maps. Hence a relatively uncongested section of road may be illustrated as congested or over capacity due to a particular link on that section that may be acting as a pinch-point.

Road capacity is affected by physical constraints on the road such as junctions including roundabouts, traffic signals, priority junctions and merges on motorways, bus stops and on-street parking. Capacity is also affected by queues formed at a downstream link which may prevent traffic from passing through. When the volume of traffic on a section of road exceeds its theoretical maximum capacity, the VCR exceeds 100%.

The East of England Plan listed 21 development centres<sup>1</sup>, noting that 'Concentrating development at these locations will make the most of existing infrastructure and the potential for improvements or extensions to it' (Final Plan paragraph 3.13) and ensuring consistency with Policies SS1 (achieving sustainable development) and SS2 (overall spatial strategy directing the most strategically significant growth to the region's major urban areas). The development centres are listed in **Table 5**.

Given recent changes in government policy regarding regional planning, the nature and scale of growth at these development centres may change, and the analysis of impacts as identified using EERM may help inform prioritisation exercises at a local level, as well as co-ordination between Local Authorities to address regional challenges in an integrated way. The key development centres identified in the East of England Plan were:

<sup>1</sup> The centres are referred to as Key Centres for Development and Change as part of Policy SS3 in the 'East of England Plan: The Revision to the Regional Spatial Strategy for the East of England' May 2008.

- Basildon
- Bedford / Kempston / Northern Marston Vale
- Bury St Edmunds
- Cambridge
- Chelmsford
- Colchester
- Great Yarmouth
- Harlow
- Hatfield and Welwyn GC
- Hemel Hempstead
- Ipswich
- King's Lynn
- Lowestoft
- Luton / Dunstable / Houghton Regis & Leighton Lincolns
- Norwich
- Peterborough
- Southend-on-Sea
- Stevenage
- Thetford
- Thurrock urban area
- Watford

It is worth noting the different methodologies for calculating stress levels in EERM, the Regional Network Report (RNR) prepared by the Highways Agency for the East of England and the Regional Network Reports for other regions (published in 2008; revised versions were due in 2010). EERM calculates stress as a ratio of volume to road capacity for each link in a peak hour. The Regional Network Report for the East of England calculates stress as a ratio of 24-hour flows to 24-hour capacity for each link. Capacity is calculated from a generic national Congestion Reference Flow (CRF) based on broad road type, whereas in EERM the model's own estimates of capacity are used, as it takes into account prevailing roadway, traffic and signal conditions.

Therefore stress as reported in EERM will have different values compared to those reported in the East of England RNR. The other regions' RNRs differ from the East of England RNR in terms of the forecasting method deployed for predicting future travel demand. The forecasting process used in other regions is based on demand, and as such does not account for changes in travel behaviour that may occur in response to congestion (such as choosing to travel a shorter distance to an alternative destination, choosing to travel at a different time of day, or by a different route, or choosing to travel by a different mode altogether, for example using public transport instead, or not travelling at all).

It can be seen that overall stress levels are high in 2031, in some cases significantly on some links. The average stress level of the most congested parts of the region's network in the morning peak hour (0800 – 0900) is about 96% in 2031, based on **Table 5**. In some cases sections of the network classified as uncongested may appear to have capacity, but it must be born in mind that bottlenecks on local roads may prevent traffic from loading onto the strategic network.

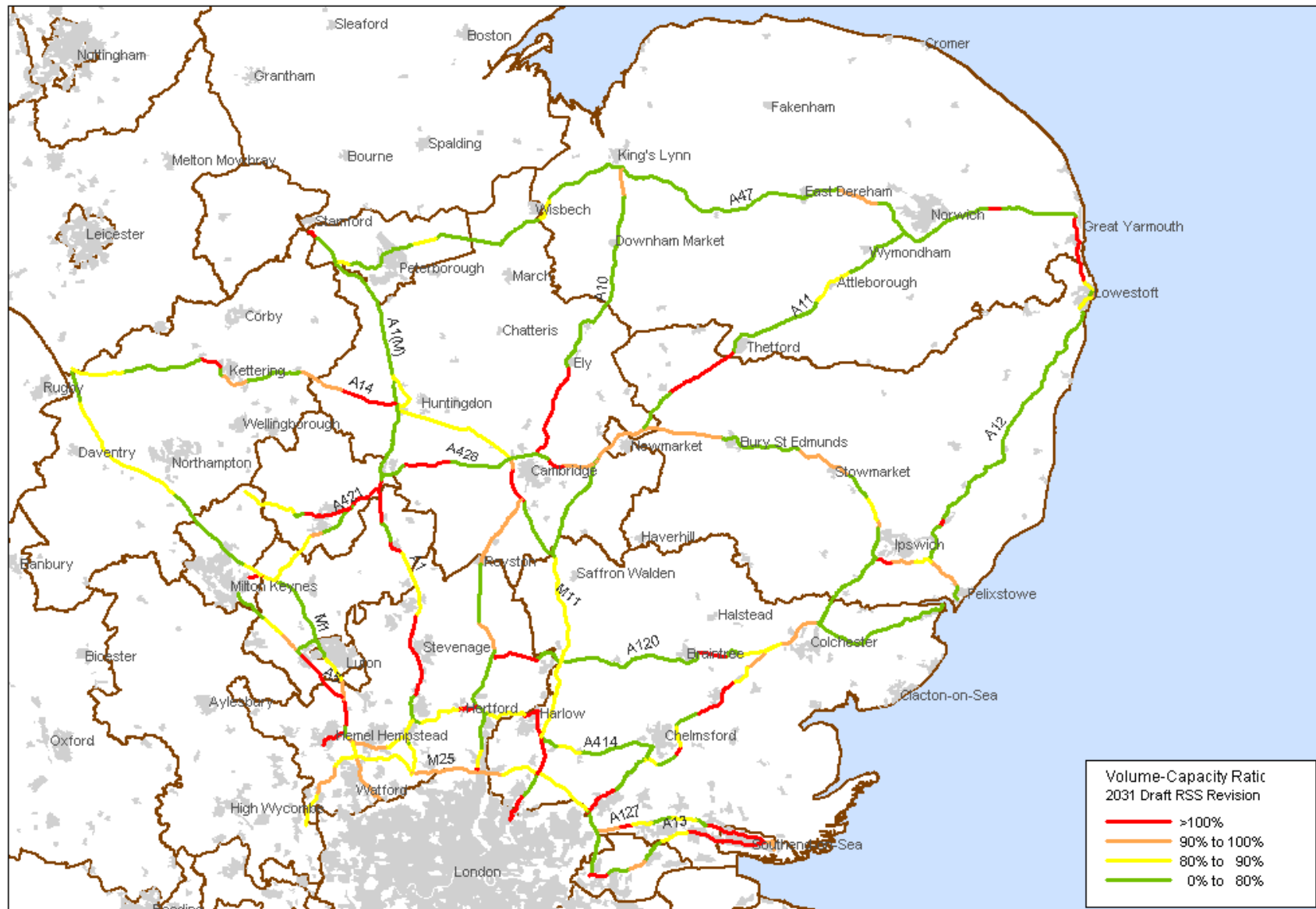


**Table 5: 2031 Draft RSS Revision Volume/ Capacity Ratios: Morning Peak Hour (0800 – 0900)**

Road	Section	Development Centre (or nearest)	2031 Draft RSS Revision
M1	Junction 4 to Junction 5	Watford	94
	Junction 5 to Junction 6A	Watford/Hemel Hempstead	96
	Junction 6A to Junction 7	Hemel Hempstead	89
	Junction 7 to Junction 8	Hemel Hempstead	76
	Junction 8 to Junction 9	Hemel Hempstead/Luton	101
	Junction 9 to Junction 10	Luton	96
	Junction 10 to Junction 11	Luton	88
	Junction 11 to Junction 13	Dunstable/Luton/Milton Keynes	78
M11	Junction 6 to Junction 7	Harlow	100
	Junction 7 to Junction 8	Harlow	88
	Junction 8 to Junction 9	Harlow	86
	Junction 9 to Junction 11	Cambridge	71
	Junction 11 to Junction 14	Cambridge	100
A1/A1(M)	Junction 1 to Junction 2	Hatfield & Welwyn GC	88
	Junction 2 to Junction 3	Hatfield & Welwyn GC	77
	Junction 3 to Junction 4	Hatfield & Welwyn GC	86
	Junction 4 to Junction 8	Hatfield & Welwyn GC/Stevenage	114
	Junction 8 to Junction 10	Stevenage	81
	Junction 10 to A421	Bedford/Stevenage	109
	A421 to A14	Huntingdon/Bedford	101
	North of A14	Peterborough	102
A5	M1 to A5120	Dunstable	130
	A5120 to A4012	Dunstable/Houghton Regis	96
	A4012 to Milton Keynes	Leighton Lincolns	109
A10	M25 to A120	Harlow/Hatfield & Welwyn GC/Stevenage	100
	A120 to A507/B1038	Cambridge/Stevenage	92
	A507/B1038 to M11	Cambridge	99
	North of A14	Cambridge/King's Lynn/Thetford	115
A11	M11 to A14	Cambridge	75
	A14 to A47	Thetford	112
A12	M25 to A130	Chelmsford	103
	A130 to A120	Chelmsford	109
	A120 to Ardleigh Junction	Colchester	98
	Ardleigh Junction to A14	Colchester	79
	A14 to Great Yarmouth	Ipswich	113
A13	M25 to A1089	Thurrock	103
	A1089 to A130	Thurrock	94
	A130 to A129	Southend-on-Sea	111
	A129 to A127	Southend-on-Sea	131
	A127 to Shoeburyness	Southend-on-Sea	108
A14	Kettering to A1	Huntingdon	115
	A1 to M11	Huntingdon/Cambridge	89
	M11 to Fen Ditton	Cambridge	72
	Fen Ditton to A11	Cambridge	100
	A11 to A11	Cambridge	93
	A11 to A140	Bury St Edmunds	97
	A140 to A12	Ipswich	100
	A12 to Felixstowe	Ipswich	98
A47	A1 to A141	Peterborough	83
	A141 to A17	King's Lynn/Peterborough	85
	A17 to A10	King's Lynn	43
	A10 to Norwich	King's Lynn/Norwich	90

Road	Section	Development Centre (or nearest)	2031 Draft RSS Revision
	Norwich bypass	Norwich	76
	Norwich to Great Yarmouth	Norwich & Yarmouth	106
A120	A10 to M11	Harlow	115
	M11 to A131	Harlow/Chelmsford	78
	A131 to A131 (Braintree Bypass)	Colchester	78
	A131 to A12	Colchester	104
	A12 to A133 (Colchester Bypass)	Colchester	64
	A133 to Harwich	Colchester	70
A127	M25 to A132	Basildon	100
	A132 to A130	Basildon	89
	A130 to A129	Southend-on-Sea	111
	A129 to A1015	Southend-on-Sea	107
	A1015 to Southend	Southend-on-Sea	119
A414	Through Hemel Hempstead	Hemel Hempstead	104
	M10 to A1(M)	Hatfield & Welwyn GC	98
	A1(M) to A10	Hatfield & Welwyn GC	117
	A10 to M11	Harlow	113
	East of M11	Chelmsford/Harlow	83
A421/ A428	Milton Keynes to M1	Milton Keynes/Dunstable/Houghton Regis	110
	M1 to A428	Bedford/Kempston	99
	A428 to A1	Bedford	105
	A1 to A1198	Cambridge	102
	A1198 to M11	Cambridge	45





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**Figure 4:** East of England Regional Model (EERM): 2031 Morning Peak Hour (0800 – 0900) Volume/Capacity Ratios on SRN and other Primary Roads

## **Discussion of Stress in Results**

## 5 Discussion

### 5.1 Overview

The following sections identify and explain high stress levels on the strategic road network (and where appropriate other primary roads) in the Draft RSS Revision test. The focus is on links which have exceeded capacity, where for example congestion may have resulted from particular pinch-points or inadequate network capacity, possibly reflecting large volumes of traffic and generated trips arising from the spatial allocation of housing and employment.

Sections of the network classified as uncongested may appear to have capacity, but it must be borne in mind that bottlenecks on local roads may prevent traffic from loading onto the strategic network. In addition, given its strategic nature EERM does not include most local urban roads, and thus does not provide a full insight into local urban or town centre congestion, where local short distance trips are most likely to be underestimated in EERM. In some cases, increased growth in housing and employment within an area may increase local trips, and increase pressure on the local network without increasing stress on the strategic network. Such local congestion may also limit the increase in other non-local trips accessing such areas, and hence using the strategic network to access these areas.

The following sections take each relevant county in turn and focus on stress levels in the morning peak hour (0800 – 0900). High stress levels, where links reach or exceed 100%, are reported. This will provide a better understanding of congestion and pinch-points in the network and help towards highlighting parts of the network that may need growth-related investment. In earlier reports, comparisons have been made between model run scenarios and therefore differences in stress levels along a given route have been reported. For the purposes of this exercise, given that a new version of EERM has been used, relevant base case, do minimum and sensitivity tests have yet to be made, and recommendations regarding this are explored in the following chapter.

## 5.2 Bedfordshire

Bedfordshire has been earmarked for 52,000 additional jobs and 64,500 additional houses between 2011 and 2031. Employment growth is broadly spread between all districts whereas housing is mainly concentrated in Bedford and South Bedfordshire, which will accommodate more than two-thirds of the growth levels envisaged. Whilst stress on the network is evident along parts of the M1, A5, A421 and A1, indicating continued reliance on the private car in the area, Bedfordshire has good rail and public transport links which should attract more sustainable trip patterns.

### M1 between Junction 8 and Junction 9

The southbound link has a VCR of 101% in 2031. This link is operating beyond capacity due to a junction approach further downstream. Both Bedfordshire and Hertfordshire (which is on the periphery of Bedfordshire) have high forecast growth rates in employment.

### A1/A1(M) between Junction 10 and A421

This section of the A1/A1(M) has a VCR of 109% in the southbound direction. This link is approaching a roundabout and experiences delays due to heavy flows on another arm which has priority movement.

### A5 between M1 and A5120

This section of the A5 has recorded stress levels of 130% in the northbound direction. This link suffers from severe congestion due to the presence of signals at the junction, causing traffic to queue and further restrict capacity. This route is currently part of the SRN, so it is worth noting that a decision will be made in due course regarding its future status, given the construction of the Dunstable Northern Bypass (A5-M1 link),

### A5 between A4012 and Milton Keynes

This northbound link on the A5 has recorded stress levels of 109%, due to high flows in the morning peak hour exceeding the available capacity.

### A421/A428 between Milton Keynes and M1

This section of the A421 is on the roundabout approach to Milton Keynes from M1 Junction 13, with stress levels of 110%. This link is over capacity due to heavy flows, and there is capacity restraint due to queuing at the roundabout.

### A421/A428 between A428 and A1

This link has a VCR of 105% in the eastbound direction travelling towards St Neots. It approaches a roundabout with A1 Great North Road and is thus subject to delays due to giving way to the A1 northbound movements which have priority over movements on the A421.

### A421/A428 between A1 and A1198

This 'overcapacity' link has stress levels of 102% in the westbound direction, due to high flows in the morning peak hour exceeding the available capacity.

## 5.3 Cambridgeshire

Cambridgeshire is envisaged to accommodate around 96,600 additional dwellings and 101,900 additional jobs in the 20-year period. Much of this growth will be absorbed by Peterborough, which is therefore expected to attract trips from both within the East of England as well as outside the region due to its close proximity to the Midlands.

Parts of the strategic routes serving Cambridgeshire, such as the A14 west of A1(M), A428, A10 and M11 are heavily congested in 2031. Given Cambridge's central location in the East of England and accessibility to and from other districts in the vicinity, this pattern seems plausible. Most districts bordering Cambridgeshire have also been allocated high employment growth, thus providing a wide option for employment for residents within Cambridgeshire and the surrounding areas.

#### M11 between Junction 11 and Junction 14

The southbound link on this section of the M11 has reached capacity, recording a VCR of 100%. There are high levels of employment and housing growth forecast in South Cambridgeshire, and a high level of flow has caused this link to operate at capacity.

#### A1/A1(M) between A421 and A14

This southbound link has recorded stress levels of 109%. Flows have exceeded link capacity, thus recording high stress levels. A high number of trips along this section of the A1 is expected, given the high employment and housing growth in both Cambridgeshire and Bedfordshire.

#### A1/A1(M) North of A14

This southbound link is operating beyond capacity with stress levels of 102%. Flows have exceeded capacity on this link, thus recording high stress levels. The link is located on the boundary of the East of England region, north-west of Peterborough. Increased stress on this link seems to indicate an increase in cross-regional work-related trips accessing employment in Peterborough, given that there is high growth in employment here in the forecast year.

#### A10 North of A14

This “overcapacity” link has a VCR of 115% in the southbound direction. The link is on the approach to a roundabout and has restricted capacity due to high flows on other turning movements which have priority over movements on this link.

#### A11 between A14 and A47

This section of the A11 has recorded stress of 112%, due to high demand in the southbound direction, between Thetford and Fiveways roundabouts, with the latter providing connections to the A1065 and A1101, and onwards on the A11 for connections to the A14 to Newmarket and Cambridge.

#### A14 between Kettering and A1

This A14 link has experienced stress levels of 115% in the westbound direction, due to high flows in the morning peak hour exceeding the available capacity.

#### A14 between Fen Ditton and A11

This ‘overcapacity’ link has a VCR of 100% in the westbound direction. Flows on this link have exceeded the available capacity, thus causing it to record high stress levels.

## 5.4 Essex

Essex has been allocated the highest level of growth in the whole East of England region, with 25% of total additional housing and 27% of total additional jobs being earmarked for the area. Additional housing and employment growth of 124,500 and 148,500 respectively have been forecast for Essex between 2011 and 2031. Thurrock, Chelmsford and Colchester are expected to accommodate the highest number of additional jobs whereas the provision of housing is concentrated to a lesser degree in those districts.

Whilst there are good rail connections in Essex, there is significant overcrowding on some rail corridors. The Essex Local Transport Plan notes that conventional methods of travel (using the road and rail network) might no longer be sustainable in the near future and the Council cannot simply manage the system based on previously adopted “predict and provide” principles; there is a serious need to consider demand management measures in order to make people rethink their travel needs and mode choice in the future<sup>1</sup>.

Growth in Essex without appropriate demand management, behavioural change or infrastructure in place is likely to cause additional pressure on the road network. Parts of the M11, A414, A127, A13 and A12 are operating beyond capacity. The A13 and A127 near Southend are highly congested, attracting a high number of work-related trips to the area.

<sup>1</sup> Essex Local Transport Plan 2006 / 2011



#### M11 between Junction 6 and Junction 7

This section of the M11 has a VCR of 100% in the southbound direction. The link is at capacity due to the high level of traffic flows. There is a possibility that increased dwellings in Harlow may result in higher London-bound trips due to the good transport links to London that the M11 provides.

#### A12 between M25 and A130

This section of the A12 is on the approach to the M25 Junction 28 in the southbound direction. It has recorded a VCR of 103% due to the high number of vehicles queuing to leave the A12 via the off-slip, thus restraining capacity.

#### A12 between A130 and A120

This southbound link on the A12 approaches the A12 junction with the A130. Flows on this link have exceeded available capacity, thus recording a VCR of 109%.

#### A13 between M25 and A1089

Stress on this link has reached 103% in the eastbound direction. This section of the A13 near Thurrock narrows from a three-lane link to a two-lane link, and the resultant decrease in capacity causes the link to become more congested. There are high levels of employment growth forecast in Thurrock.

#### A13 between A130 and A129

This link has stress levels of 111% on the eastbound approach to Sadler's Farm Roundabout in Basildon. This junction is heavily congested with traffic blocking back on various links, including this link, despite planned junction improvements undertaken in 2012. Heavy flows on the roundabout have caused flows along this link to queue and block back, thus resulting in high stress levels. There are high forecast growth rates in employment in South Essex.

#### A13 between A129 and A127

This 'overcapacity' link has a VCR of 131% in the westbound direction near Southend-on-Sea. The link approaches a roundabout junction where all arms are congested, with some traffic blocking back on other arms. The heavy flows have caused queues and delays along this link, thus resulting in high stress levels. Southend-on-Sea has been allocated twice the amount of employment compared to housing and therefore the high stress may reflect high levels of in-commuting.

#### A13 between A127 and Shoeburyness

This westbound link has recorded stress levels of 108%, due to high flows in the morning peak hour exceeding the available capacity. This link is at a junction where flows are blocking back from a link downstream.

#### A120 between A131 and A12

This westbound link has stress levels of 104% on the junction approach with the A120 and A131 to the east of Braintree. This link approaches a roundabout with heavy flows on all junction arms, causing queuing and delays, which have increased stress levels.

#### A127 between M25 and A132

This link experiences high stress levels in the eastbound direction of 100%. This section of the A127 is to the north of Basildon and high employment and housing growth is forecast for the district over the 20-year period. This link has high flows and is operating at capacity.

#### A127 between A129 and A1015

This link has a VCR of 107% in the eastbound direction. This link is at a signalised junction which has resulted in capacity being restricted on the junction arms. This has caused this link to operate beyond capacity and record high stress levels.

#### A127 between A1015 and Southend

This 'overcapacity' link has recorded stress levels of 119% in the westbound direction. This link is at a signalised junction with flows blocking back from the downstream link further west.

## 5.5 Hertfordshire

Hertfordshire has been allocated 108,100 additional jobs in the 20-year period and 71,300 additional dwellings. Parts of the A1, A120 and A414 are congested, potentially indicating work-related trips from Essex and north-south movements within Hertfordshire.

### A1/A1(M) between Junction 4 and Junction 8

This southbound link just south of Junction 7 has recorded stress levels of 114%. Flows have exceeded link capacity, thus recording high stress levels. There are high levels of employment growth forecast for South Hertfordshire, especially St Albans.

### A10 between M25 and A120

This section of the A10 has forecast stress levels of 100% in the southbound direction approaching the M25 at Junction 25. Signals at the M25 junction further downstream have caused significant delays on this link due to the high level of traffic passing the M25 junction. This has resulted in the blocking back of traffic from the junction, thus affecting capacity on this link.

### A120 between A10 and M11

This 'overcapacity' link has a forecast VCR of 115% in the eastbound direction. This link is at a signalised junction, which has caused flows to queue at the junction and limit capacity. High delays of nearly 10 minutes are experienced at this junction due to the signals.

### A414 through Hemel Hempstead

This section of the A414 has forecast stress of 104% in the westbound direction. This link approaches a roundabout with heavy flows on other arms. Capacity is reduced due to queuing and giving way to traffic on the right. This link is in Dacorum, which has been earmarked for high employment growth.

### A414 between A1(M) and A10

This link has a forecast VCR in the westbound direction of 117%. The link approaches a roundabout which has traffic blocking back from the approach to the roundabout due to queuing. This results in the link operating beyond capacity.

### A414 between A10 and M11

This link is on the westbound direction, with forecast stress levels of 113%, due to high flows in the morning peak hour exceeding the available capacity.

## 5.6 Norfolk

Norfolk has been earmarked for additional housing and employment growth totalling 79,500 and 64,600 respectively. Norwich is forecast to accommodate the highest levels of housing in the region, with 37,000 dwellings, which amounts to 7% of the total 20-year period allocations for the region, and 47% for Norfolk. With the exception of Norwich and the Great Yarmouth urban area, Norfolk has a relatively low population density. The main areas of congestion occur on the A12 and A47, although there is moderate congestion on the A11 (northbound between the Norwich Road on-slip at Attleborough and the London Road off-slip near Spooner Row, with higher flows occurring on the A11 on this stretch due to trips entering the network from Norwich Road).

### A12 between A14 and Great Yarmouth

This A12 link has forecast stress levels of 113% in the northbound direction south of Great Yarmouth. This link is at a roundabout junction with heavy flows on all arms, resulting in heavy delays due to other turning movements having priority over flows on this link.

#### A47 between Norwich and Great Yarmouth

This 'overcapacity' link has a VCR of 106% in the westbound direction, due to high flows in the morning peak hour exceeding the available capacity.

### 5.7 Suffolk

Suffolk has been allocated 64,300 dwellings and 71,700 jobs in the 20-year period from 2011. Growth is mainly centred on urban areas such as Ipswich and St Edmundsbury; however there will also be significant employment growth in the coastal areas. This may result in increased reliance on the private car and greater use of sub-urban and minor road networks.

#### A14 between A140 and A12

This westbound link approaching Junction 55 on the A14 is forecast to operate beyond capacity with a VCR of 100%, due to high flows in the morning peak hour exceeding the available capacity.

## **Summary & Conclusions**

## 6 Summary, Conclusions and Next Steps

### 6.1 Summary and Conclusions

This report has examined the implications of the growth scenario described in the *East of England Plan 2031: Draft Revision to the Regional Spatial Strategy for the East of England*, March 2010, on the strategic road network, providing a benchmark against which Local Authorities (LAs) and the Highways Agency can develop and test new planning and infrastructure assumptions, and fully understand the implications of recessionary impacts on growth and funding.

Chapter 3 summarised the proposed housing and employment growth, in terms of total growth and distribution. Chapter 4 presented the high level results for trips originating within the East of England, which showed an overall increase in person trips of 18% from 2006 to 2031. Car trips increased by 15%, LGV trips by 78% and HGV trips by 24% from 2006 levels. Rail trips increased by 137% and bus and coach trips decreased by 22%. Vehicle trips increased by 18% overall and public transport by 26%, with the latter being made up entirely of rail trips.

Chapter 5 demonstrated that various parts of the strategic road network are congested in the morning peak hour (0800 – 0900), despite delivery of a series of network improvement schemes, due to the scale of housing and employment growth over the 20-year period from 2011 to 2031.

The Draft RSS Revision directed growth towards larger towns and cities, such as Cambridge, Peterborough and Thurrock. It also concentrated growth towards the western part of the East of England where relatively better public transport and rail links exist, which may minimise dependence on the private car and longer distance road trips.

The overall mode share for cars decreased slightly from 88% in 2006 to 85% in 2031, whilst rail mode share doubled to 4%. Nevertheless, the scale of growth on the highway network is likely to increase pressure on the road network, both at a local and regional level.

Some of the key routes with high congestion include:

- A428/A421 between Bedford and A1;
- Part of the A1 between Welwyn Garden City and St Neots;
- M1 between Junction 8 and Junction 9;
- A10 between Cambridge and Ely;
- A11 between Newmarket and Thetford;
- A127 between Basildon and Southend-on-Sea;
- A13 between Basildon and Southend-on-Sea;
- M11 between Junction 6 and Junction 7; and
- A12 between Great Yarmouth and Lowestoft.

Where the strategic road network does not appear very congested, it does not necessarily mean that it is not affected by growth. Congestion at a local level may be preventing traffic from accessing the strategic road network. It could also mean that whilst parts of the network remain uncongested, other pinch-points along the network may be causing trips to divert to more minor routes in the area. Conversely, routes that appear highly congested may be experiencing high levels of stress at particular pinch points.

## 6.2 Discussion

The findings of this report help set out the implications of housing and employment allocations on the strategic road network. Whilst it provides a broad insight into how they affect the network, other more complex issues will also play a part in determining trip patterns including socio-economic objectives, and transport planning and land-use policies at a local level. In addition, although there may be some investment in infrastructure and capacity enhancements, the scale of growth, as well as constraints on funding, are likely to require a more concerted and broad ranging programme of interventions. These include integrated demand management (such as hard shoulder running), influencing travel behaviour, the application of smarter choice programmes, and appropriate investment in public transport.

Transport and land-use policies should be informed by the evidence base on the impacts of different planning scenarios. As well as impacts on the transport network, for example in terms of congestion or overcrowding, it will be vital to examine impacts on the environment, and in particular to demonstrate consistency with not only economic growth objectives, but carbon reduction targets and social inclusion goals.

One of the Highways Agency's key responsibilities is to play its part in delivering carbon reduction strategies for transport, addressing the challenges of climate change in terms of adapting to the changes and reducing its own emissions<sup>1</sup>. It also has an important role to play in terms of its management of the network and influencing travel behaviour and how these relate to the overall strategy for reducing carbon emissions from transport, whilst enabling economic growth.

The recent report into the effects of the smarter choices programme in the sustainable travel towns<sup>2</sup> (Darlington, Peterborough and Worcester) concluded that the Sustainable Travel Towns Programme was successful in reducing travel by car and increasing the use of other modes, with excellent value for money. There was a large proportionate reduction in shorter car journeys, but the study noted that the **largest contribution to reduced traffic volume and carbon emissions are likely to be due to changes in medium to longer distance journeys**. There are clear linkages with both wider environmental impacts and integrated demand management measures, and EERM may develop the appropriate tools to take these into account in future work, informing the development of planning scenarios and targets.

In the current socio-economic and political climate, preference will be given to those programmes that demonstrate value for money within tightly capped funding limits, address worklessness and social exclusion, enable achievement of environmental goals and carbon reduction targets, and provide cost-effective solutions to clearly identified challenges, both current and forecast. The government has made it clear that it expects greater involvement from the private sector, and in the case of bids to the Regional Growth Fund expects projects to demonstrate significant private sector leverage.

This requires the use or development of appropriate tools to demonstrate the impact of seemingly cost-effective solutions, such as integrated demand management and smarter choices, and provide evidence on the wider economic and carbon impacts. This will help ensure that growth is not focused solely on congestion issues, and will demonstrate the commitment to a broader social and environmental agenda. Regional planning going forward will need an informed evidence base to assist Local Authorities in co-ordinating with each other, and to assist in developing both local and regional planning options.

This report has demonstrated the congestion impacts of the latest set of consultation planning data (March 2010). It should be noted that this was based on assumptions made in September 2009 about growth for the period 2006 to 2011. In June 2010, revised dwelling and employment forecast figures were made available for 2006-2011, subsequent to the analysis presented in this report. At the time of writing, the employment forecasts for 2006 – 2011 were being revised again due to changed assumptions on recessionary impacts on growth. This will require revised tests to explore the effects of do minimum and growth scenarios.

The updated planning data will take into consideration the current economic climate in terms of the impact on housing and employment levels, and further analysis will be required to understand how changes in

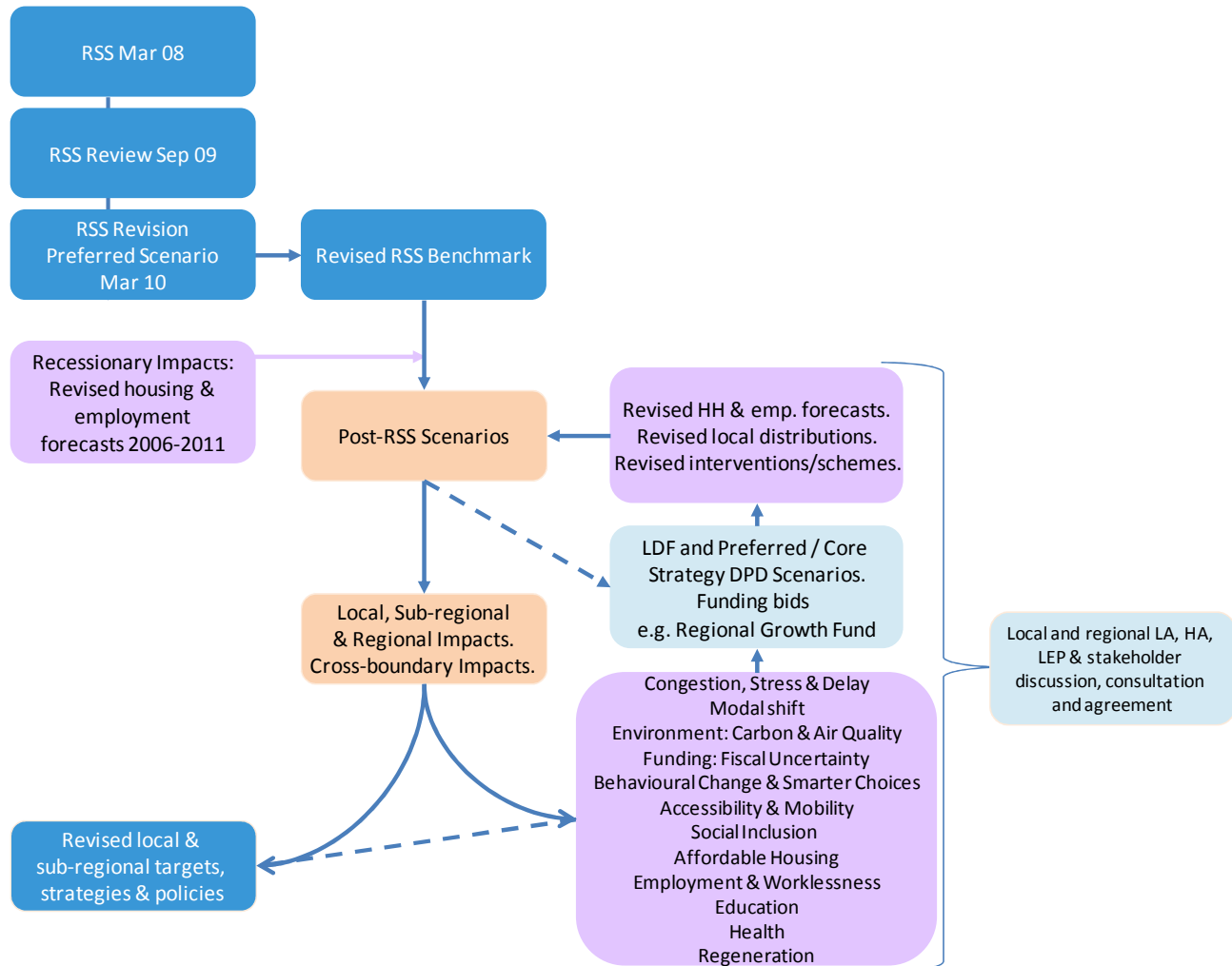
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<sup>1</sup> Highways Agency Business Plan 2010-11

<sup>2</sup> Sloman, L., Cairns, S., Newson, C., Anable, J., Pridmore, A. and Goodwin, P. (2010) *The Effects of Smarter Choice Programmes in the Sustainable Travel Towns*

growth will impact upon the strategic road network, and where reductions in growth assumptions may alleviate some of the pressure points on the network in the short to medium term. Furthermore, the changed nature of regional planning, the uncertainty surrounding elements of the revised Regional Funding Allocation (RFA) and the shift in emphasis in government priorities may result in Local Authorities taking the opportunity to revisit their policies on the spatial allocation of growth and timing of developments. The social, economic, and environmental impacts of these decisions will need to be taken into account.

**Figure 6** illustrates the steps that have been and will need to be undertaken to build an evidence base, using EERM and other tools, to inform revised planning scenarios and prioritise interventions and the allocation of funds.



**Figure 5:** Informing the development of planning scenarios and co-ordination between Local Authorities, the Highways Agency, local enterprise partnerships and other stakeholders using EERM

### 6.3 Next Steps

In May 2010 the government set out its commitment to abolish Regional Strategies, and for Local Planning Authorities and the Planning Inspectorate to take this into account as a material planning consideration in their decision-making process. In July 2010 the Government formally announced the abolition of the Regional Spatial Strategies, and following this began consultation on the Regional Growth Fund<sup>3</sup>. Part of the fund is likely to be available to bids that demonstrate significant private sector leverage and longer term

<sup>3</sup> BIS, DCLG, HM Treasury (July 2010) *Consultation on the Regional Growth Fund* (responses due 6th September 2010).

benefits that integrate with local planning policies and where appropriate national infrastructure investment, providing strategic oversight and maximising economic impacts. The Government is keen on the creation of local enterprise partnerships. A White Paper is due for publication in autumn 2010, setting out more details on local enterprise partnerships and the Growth Fund. It is likely that some of the responsibilities of the Regional Development Agencies (RDAs) will be taken on by these partnerships, which are set to be introduced in the forthcoming Decentralisation and Localism Bill. The Government received a number of proposals for the creation of local enterprise partnerships from across the country in early September 2010.

Given the effort involved in the last few years in incorporating RSS targets and policies, there will need to be a robust process and mechanism in place to change or reallocate growth at the sub-regional level, and understand the implications. Irrespective of any changes, cuts in funding are likely to curtail many of the programmes, such as transport, water, sewage and energy infrastructure, required for delivery of housing and employment. This will place greater emphasis and stress on sub-regional planning and achieving economies of scale within and between local authorities. Consistent decisions will be required on development across boundaries, such as public transport, waste provision and affordable housing, which require a high level of cross authority working.

Various authorities across the East of England have identified issues regarding the state and quality of housing, whether owner-occupied or rented, and in both the private and social housing sectors. Concomitant with this has been the identification of a lack of affordable housing, but in many cases policies to address these have been based on assumptions on the delivery of overall targets for housing. Policies regarding social exclusion, educational attainment, worklessness, and accessibility will therefore be drawn more strongly into the new localism agenda.

Local planning authorities should continue to develop LDF core strategies and other DPDs. In doing so, they will continue to have regard to the development plan but also national policies, and may continue to use the evidence that informed the preparation of the Regional Strategies<sup>4</sup>. In any case, the Highways Agency will continue to play an important role, as they assess the impacts of local developments on the strategic road network, and in ensuring that EERM is used to help inform strategic planning, option development and decision-making during and after this transition period. The following list includes key considerations and issues:

- The planning data and research undertaken for EERM should be made available to local authorities for the preparation or revision of their local plans, and to understand the implications of the latest economic, funding and infrastructure assumptions on existing targets. The Highways Agency and AECOM should ensure continuing collaboration with and between local authorities. This includes neighbouring authorities in London, the East Midlands and the South East.
- Land use planning and transport policy need to be closely aligned and complementary.
- There is merit in updating the benchmark test in this Report with the latest data available to take into account recessionary impacts on current and forecast growth.
- Some authorities may decide to retain their existing targets, whilst others may seek to revise them. There are benefits in undertaking assessments that examine impacts on the entire main road network, including major roads that do not form part of the Highways Agency's Strategic Road Network.
- The environmental impact of policies must be considered, including the carbon emissions from transport under different planning scenarios.
- Interventions may have wider economic benefits that are not currently assessed in appraisal, and which may need to be considered in order to fully understand the case for and against different interventions. This may be essential to make the case for funding or ensure significant private sector involvement. The probability of success within any given region or sub-region will be highly dependent on the ability of local authorities and others to work together.
- Local Authorities, the Highways Agency, and relevant stakeholders including Chambers of Commerce, businesses and the third sector, will need to think about how they can use the existing tools and

<sup>4</sup> Of which EERM was one of the key components.



evidence base to create coherent packages of projects that can draw on alternative sources of funding, including but not limited to the Regional Growth Fund, or create innovative funding and financing arrangements suited to local needs. The Government is likely to encourage local enterprise partnerships to play a key role.

- The relationship between transport and the achievement of goals associated with housing, employment, social inclusion, accessibility and health should be further explored.
- The role of smarter choices and mechanisms to influence travel behaviour may be more cost-effective in addressing congestion and meeting carbon reduction targets. As noted in results for the Sustainable Travel Towns Programme, the programme offered excellent value for money, and the largest contribution to reduced traffic volumes and carbon emissions may come from changes to medium and longer distance journeys.

## **Appendix A – Future Year Schemes**

## Appendix A – Future Year Schemes

All the schemes included in Appendix A form the Core Schemes for the draft revision to the RSS model run. The highway network includes schemes committed to 2024, assuming no further schemes to 2031. The schemes were agreed with the Highways Agency in March 2010, based on the understanding at that time of committed schemes.

Scheme Description	Opening Year
M11 J8 Slip Road Improvements	Dec 2006
M11 J8 / A120 Slip Road Improvements	Dec 2006
A11 Attleborough Bypass Dualling	2007
A1198 Papworth Everard Bypass	2007
A4146 Linslade and Stoke Hammond Bypass	2007
A428 Caxton Common to Hardwick	2007
A131 Dualling between A120 - A130 near Braintree (Great Notley)	2007
M25 Holmesdale Tunnel Refurbishment and M25 Junction 25 Improvements	2007
A14 Spittals Interchange	2007
A12/A14 Copdock Interchange Traffic Signals	2007
A12/M25 Brook Street Interchange	2008
A507 Ridgmont Bypass and Woburn Link	2008
M25 J1B-3 Widening	2008
A1139 Peterborough Fletton Parkway widening between J2-3	2008
Cambridge Cowley Road Park & Ride Relocation	2008
A1 Peterborough to Blyth Grade Separated Junctions	2008/09
A1081 Luton South Circular Improvements (East Luton Corridor)	2009
M1 Dual 4 Junctions 6A-10	2009
A14 Haughley New St, Stowmarket	2009
A6 Dualling Wilstead to A421 (Wixams)	2009
A2 Bean to Cobham Widening Phase 2	2009
M1 Junction 14 improvement	2009
Biddenham (Bedford) Park & Ride	2009/10
A4071 Rugby Western Relief Route	2010
A5134 Bedford Western Bypass	2010
Stowmarket B1115 Relief Road	2010
A1073 Spalding to Eye	2010

Scheme Description	Opening Year
A421 Dualling M1 to Bedford	2010
M1 J25-28 Widening	2010
A43 Corby Link Road	2010
A12/A134 New Junction	2011
A509 Isham Bypass	2011
A12 Hatfield Peverel to Witham Link Road	2011
Cuckoo Corner, Southend	2011
M1 J10-13 Improvements	2013
A13 Sadler's Farm Junction Improvements	2012
M1 J19 Improvements	2013
M25 Widening to Dual 4 Junctions 27-30	2012
M54 to M6 Birmingham Northern Relief Road Link	2012
M25 Widening to Dual 4 Junctions 16-23	2012
A14 Widening Kettering Bypass	2012
A11 Fiveways to Thetford	2013
Dunstable Northern Bypass (A5-M1 Link)	2013
Norwich Northern Distributor Road	2015
M25 J5-7 Widening	2015
A14 Ellington to Fen Ditton	2016
M1 to M69 Link Roads and Widening to M1 J21A	2015
M25 Junction 30 Improvements	2015
HSR M1 J28-31 Improvements	2015
M25 Dual 4 Junctions 23-27 Managed Motorway	2016
A421 Milton Keynes - M1 Widening	2016
Additional A12 Capacity Improvements	2016
Hard shoulder running on M6 Junction 2 to Junction 4	2024
Hard shoulder running on M1 Junction 13 to Junction 19	2024
Hard shoulder running on M1 Junction 24 to Junction 25	2024
Dartford Crossing – toll	
London Congestion Charge	
M6 toll	

## **Appendix B – Definitions and Glossary**

## Appendix B – Definitions and Glossary

The highway network is made up of a series of links, each of which is defined in terms of its capacity and saturation flow. Changes to these, such as coding a higher saturation flow than in a previous model, or making different assumptions on the signalling (e.g. increased green phases) or turning restrictions, may result in a different estimate of congestion and 'stress', assuming that the volume of traffic (measured in terms of passenger car units) remains the same. Where capacity is increased the effect on congestion may of course be minimal if traffic re-routes from other congested links or if the flow is significantly lower than the capacity.

These terms together with other concepts required for an understanding of Chapters 4 and 5 are defined in Table B.1.

**Table B.1** Key terms and descriptions to explain network coding changes and assumptions

Key terms used	Description
Capacity	The saturation flow taking into account the effective green time available together with any opposing movements and blocking back from other links. In effect, this is the maximum number of vehicles that can reasonably be expected to pass over a given roadway or section of roadway, in one direction, during a given time period and under the prevailing roadway, traffic, and signal conditions.
Flow	The rate, in vehicles per hour or passenger car units (PCU) per hour, at which traffic crosses a point.
Flow ratio	Ratio of the actual flow to the saturation flow.
PCUs and volume	Passenger Car Unit equivalent – this is a measure of traffic volume. A large vehicle (e.g. HGV) will be defined as more than 1 PCU.
Peak period/hour	The morning peak period is usually defined as 7am – 10am, and the morning peak hour as 8am – 9am. The evening peak period is usually defined as 4pm – 7pm, and the evening peak hour as 5pm – 6pm. The inter peak period is usually defined as 10am – 4pm, and hourly results are usually defined in terms of an average inter peak hour.
Saturation flow	This is the maximum flow that would occur if vehicles were flowing smoothly and not interrupted, for example with continuous green signals, and assuming a continuous queue of vehicles with minimal headways between each vehicle.
Volume/ capacity ratio and stress levels	The measured or modelled volume of traffic (flow) relative to the theoretical maximum flow (i.e. the capacity). The higher the ratio (or percentage), the greater the congestion or 'stress' levels that will be experienced on the link. For the purpose of this Report, congestion has been defined against volume/capacity ratios as follows: <ul style="list-style-type: none"> <li>• 0-80%: no congestion</li> <li>• 80-90%: moderate congestion</li> <li>• 90-100%: severe congestion</li> <li>• &gt;100%: over capacity</li> </ul>
Zone centroid	The model area is split into a number of demand zones. Trips have an origin and a destination in a zone (trips which start and end in the same zone are termed intra-zonal trips). Each zone has a 'centroid', and there are links from this central point onto the highway network at the most appropriate locations (a centroid can have more than one link onto the highway network in a given zone).

**Key Acronyms**

DfT	Department for Transport
DPD	Development Plan Documents
EoEM	East of England Model
EERA	East of England Regional Assembly
EERM	East of England Regional Model
EiP	Examination in Public
HGV	Heavy Goods Vehicle
LDF	Local Development Framework
LEP	Local Enterprise Partnerships
LGV	Light Goods Vehicle
NTM	National Transport Model
PCU	Passenger Car Unit equivalent
RDA	Regional Development Agency
RFA	Regional Funding Allocation
RHRM	Regional Highway Routeing Model
RNR	Regional Network Report
RSS	Regional Spatial Strategy (in this case, the East of England Plan)
SRN	Strategic Road Network
TPI	Targeted Programme of Improvements
VaDMA	Variable Demand Modelling Advice
VCR	Volume/Capacity Ratio