

East Anglia THREE

# Appendix 27.16

## Sensitivity Analysis

### Environmental Statement

Volume 3

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**Note**

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**Subject: East Anglia THREE - Employee traffic sensitivity**

**Introduction**

This note has been produced by Royal HaskoningDHV for East Anglia THREE Limited to inform Suffolk County Council (SCC) of the findings of a sensitivity test of employee traffic distribution for the onshore electrical transmission works for the proposed East Anglia THREE project.

Following their review of the draft Traffic and Transport chapter, SCC expressed concern that some of the assumptions used to derive construction worker origins could potentially lead to an underestimation of traffic impacts upon some highway links and junctions. Specifically, two issues were raised:

- 1) SCC wished to see a 90 minute drive time tested for the sourcing of resident workers; and
- 2) SCC requested further information as to how a resident worker to car share ratio of 2.5 would be achieved.

Following further clarification with SCC the following parameters were agreed for the sensitivity test:

- Increase the potential for resident employment from 34% to 66% (with a corresponding reduction in in-migrant workers); and
- The catchment area for resident (also known as local) workers increased to a 90 minute drive time with no distance decay.

**Employee distribution**

To inform the distribution of the employees who could potentially be drawn from the local area Peter Brett Associates (authors of the socio economics study, presented as Chapter 28 Socio Economics, Tourism and Recreation) have examined the distribution of residents within the local area with the relevant skill sets, (expressed as a 90 minute drive for the two Primary Construction Consolidation Sites (PCCS)). This distribution is presented as **Appendix A**.

The following **Table 1** provides a summary of the distribution compared to that previously assessed for a single construction phase worst case traffic scenario.

**Table 1 Resident employee distribution**

Point of entry to study area	% distribution (residents) to PCCS B		% distribution (residents) to PCCS E	
	Draft assessment	Sensitivity Test	Draft assessment	Sensitivity Test
A12 south (Link 5)	40.3%	62.8%	43.6%	62.3%
B1113 south (Link 7)	5.0%	0.0%	0.0%	0.0%

Point of entry to study area	% distribution (residents) to PCCS B		% distribution (residents) to PCCS E	
	Draft assessment	Sensitivity Test	Draft assessment	Sensitivity Test
A14 south (Link 11)	3.0%	0.3%	2.0%	0.5%
A12 north (Link 17)	0.0%	0.8%	8.9%	11.7%
B1078 east (Link 18)	1.0%	0.0%	0.0%	0.0%
B1079 (Link 19) *	0.0%	0.0%	0.0%	1.5%
A1214 (Link 22)	17.0%	2.9%	21.8%	7.5%
A14 north (Link 25)	28.7%	20.8%	19.8%	15.1%
<b>A140 north (link 24) *</b>	<b>0.0%</b>	<b>11.5%</b>	<b>0.0%</b>	<b>0.0%</b>
B1438 (Link 28)	5.0%	0.9%	4.0%	1.4%
* not originally assessed				

It can be observed from **Table 1** that expanding the cordon results in greater numbers of workers originating from further afield especially the south via A12 link 5 with a corresponding reduction in traffic on local routes, such as the A1214 through Ipswich.

**Table 2** further disaggregates the worker trips (both local and in-migrant) by the highway links in the assessment study area.

**Table 2** *Worker distribution*

Link	Link description	Link sensitivity	Daily traffic flows		
			Draft Assessment	Sensitivity Test	Change
1	A14 between the J51 and J52	Low	15	43	+ 28
2	A14 between the J52 and J53	Low	134	114	- 20
3	A1156 south from J53	Medium	64	46	- 18
4	A14 between the J53 and J55	Low	94	103	+ 9
5	A12 south from J55	Low	116	202	+ 86
7	B1113	Medium	110	107	- 3
9	A14 between the J55 and J56	Low	78	115	+ 37
10	A14 between the J56 and J58	Low	78	115	+ 37
11	A14 south from J58	Low	62	28	- 34
14	A12 between J58 and Top Street	Low	167	173	+ 6
16	A12 between Top Street and the A1152	Medium	117	102	- 15
17	A12 north from the A1152	Low	84	59	- 25
19	B1079 from the A12 to Grundisburgh	Medium	27	38	+ 11
21	B1077 between the B1078 and A1156	Medium	33	32	- 1
22	A1214 west from the A12	High	125	63	- 62
23	B1078 between the A140 and B1077	High	22	30	+ 8

Link	Link description	Link sensitivity	Daily traffic flows		
			Draft Assessment	Sensitivity Test	Change
24	A140 north-east of J51	Low	22	42	+ 20
25	A14 north of J51	Low	26	53	+ 27
28	B1438	High	39	20	- 19

It can be observed from **Table 2** that of the 30 links that form the study area, 19 demonstrate a change in traffic of which 10 show an increase in traffic (marked as red) ranging between six and 86 two-way vehicle movements per day. The remaining links are showing a reduction in traffic.

The links showing an increase have been considered further to understand if the traffic increases would lead to significant impacts. **Table 3** sets out the magnitude of effect for those links.

**Table 3** *Magnitude of effect per link*

Link	Link sensitivity	Background 2020 flows (24Hr AADT *)		Single Phase – two-way construction vehicle movements (draft assessment)		Percentage increase		Single Phase – two-way construction vehicle movements (sensitivity test)		Percentage increase	
		All Veh.	HGVs	All Veh.	HGVs	All Veh.	HGVs	All Veh.	HGVs	All Veh.	HGVs
1	Low	51751	6963	231	216	0.4%	3.1%	259	216	0.5%	3.1%
4	Low	54257	6898	425	331	0.8%	4.8%	434	331	0.8%	4.8%
5	Low	50530	5707	547	432	1.1%	7.6%	633	432	1.3%	7.6%
9	Low	62332	8435	495	417	0.8%	4.9%	532	417	0.9%	4.9%
10	Low	50226	7536	495	417	1.0%	5.5%	532	417	1.1%	5.5%
14	Low	45211	1956	630	463	1.4%	23.7%	636	463	1.4%	23.7%
19	Medium	7349	223	137	110	1.9%	49.3%	148	110	2.0%	49.3%
23	High	3604	147	22	0	0.6%	0.0%	30	0	0.8%	0.0%
24	Low	18580	1876	22	0	0.1%	0.0%	42	0	0.2%	0.0%
25	Low	44872	6754	237	211	0.5%	3.1%	264	211	0.6%	3.1%
Exceeds IEMA screening thresholds											

The draft assessment utilised IEMA Rule 1 and Rule 2<sup>i</sup> to screen the potential significance of the traffic increases.

Applying the same rules it can be observed from **Table 3** that of the 10 links showing an increase in traffic under the sensitivity scenario, no additional links are screened in to the assessment. Furthermore, the link screened in for both draft assessment and sensitivity test (link 19) shows an indiscernible increase.

It is therefore concluded that the impacts upon, severance, pedestrian amenity and road safety remain unchanged from the draft assessment.

The IEMA screening thresholds do not apply to driver delay as the potential impact is defined as significant when the traffic system surrounding the development under consideration is at or close to capacity. The draft assessment recognised this by agreeing the sensitive junctions with SCC and assessing the potential for a significant impact. These junctions would be subject to further assessment in the Traffic Management Plan (TMP) following the appointment of the main contractor and establishment of the workforce travel patterns.

**Table 4** reviews the suite of eleven sensitive junctions identified to ascertain if the sensitivity test would change the magnitude of effect and therefore the assessed outcome. In addition, the junction of the A14 and A12 south has been added to the assessment in recognition of the change in demand for workers travelling from the south.

**Table 4** *Magnitude of effect per junction*

Junction		Draft assessment	Sensitivity Test	Change	Assessed as a potentially significant impact (Y/N)	
No.	Description	Arrivals per junction (pm peak)			Draft assessment	Sensitivity test
1	Roundabout junction of the A14 and B1113	96*	90*	- 6	Y	Y
2	Double mini roundabout junction of the A1214 and A1156	33	29	- 4	N	N
3	Signalised priority junction of the A1214 and Henley Road	33	29	- 4	N	N
4	Roundabout junction of the A1214 and B1077	42	33	- 9	N	N
5	Roundabout junction of the A12 and A1214	110	115	+ 5	Y	Y
6	Roundabout junction of the A12 and Newbourne Road	70	91	+ 21	N	Y
7	Roundabout junction of the A12 and B1079	60	53	- 7	N	N
8	Priority junction of the B1079	15	19	+ 4	N	N

Junction		Draft assessment	Sensitivity Test	Change	Assessed as a potentially significant impact (Y/N)	
No.	Description	Arrivals per junction (pm peak)			Draft assessment	Sensitivity test
	and Manor Road					
9	Roundabout junction of the A12 and A1152	45	33	- 12	N	N
10	Signalised priority junction of the A1152 and B1438	3	3	0	N	N
11	Roundabout junction of the A12 and B1438	156	159	+ 3	Y	Y
12	Roundabout junction of the A14 and A12 (south)	80*	119*	+ 39	N	Y
* Turning movements only (does not include A14 through traffic)						

It can be observed from **Table 4** that the sensitivity test does not change the assessed outcomes for the majority of the junctions with three junctions (1, 5 and 11) identified as having potential significant impacts. However, it can be noted that junctions 6 and 12 have marked changes to the traffic flows and it is therefore recommended that these junctions are identified for further assessment in the DCO submission in addition to those junctions previously selected.

### Employee to vehicle ratio

An employee to vehicle share ratio of 2.5 was adopted in the draft assessment noting that blue collar workers would be transported by mini-bus or similar and could potentially achieve an equivalent ratio of 5.0 or above, whereas white collar workers would have a lower propensity to vehicle share but would make up a lower proportion of the workforce. Therefore, the overall car share ratio of 2.5 is considered a realistic worst case traffic generation.

The draft assessment contained a range of potential peak numbers of on-shore workers as set below:

- 250 workers – established by optimising the construction programme as set out in **Appendix 27.9** of the draft Chapter 27 Traffic and Transport;
- 285 workers - estimated full time equivalents set out in the draft Chapter 28 Socio Economics, Tourism and Recreation; and
- 528 workers - worst case worker intensity for a non-optimised construction programme (overlapping peak activities) as set out in **Appendix 27.9** of the draft Chapter 27 Traffic and Transport.

It can be noted that the worst case worker intensity utilised for the traffic assessment represents a further tier of robustness ensuring that the total derived worker vehicle trips are within an acceptable assessment window.

The assessment does not discriminate by the type of worker or if they are resident or in-migrant. Therefore, all person trips have been subject to a 2.5 ratio regardless of journey origin. This will be controlled by the provision of parking spaces on site supplemented by a comprehensive monitoring and enforcement regime to deter 'overspill' parking. This regime will be set out in the outline Travel Plan, formalised in the pre-construction Travel Plan and which in turn will form part of the contractual obligations in the construction tender.

### **Summary and Conclusion**

The sensitivity test of employee distribution has demonstrated that there is no material change to link traffic flows as a result of widening the local worker catchment area. Therefore the assessed impacts for severance, pedestrian amenity and road safety remain unchanged from the draft assessment.

The sensitivity test of junction arrivals identified junction 6 (A12/Newbourne Rd) and junction 12 (A14/A12 south) have marked changes to the traffic flows and will be further assessed, and results presented, in Chapter 27 Traffic and Transport for inclusion within the ES, in addition to those junctions previously selected.

A strategy for controlling worker to vehicle share ratio is outlined which is not compromised by changes to distribution patterns. This strategy will be expanded in the outline Travel Plan.

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i The Guidelines for the Environmental Assessment of Road Traffic, 1993, IEMA (formally IEA) "Rule 1 and Rule 2".

Rule 1: Include all highways links where traffic flows (or HGV component) will increase by 30%; and

Rule 2: Include any other specifically sensitive areas where traffic flows (or HGV component) have increased by 10% or more



## APPENDIX A

### **Paper Mill Lane**

- Paper Mill Lane is used as the centre point;
- Resident workers are assumed to originate from within a 90 minute drive time of the Paper Mill Lane centre point;
- Resident construction workers are proportionally allocated to areas according to each areas level/ concentration of construction employees (derived from Census 2011 data via PBA GIS).<sup>1</sup>

### **Three scenarios**

- Scenario 1: 188 resident workers (66% residents, 34% In-migrant);
- Scenario 2: 143 resident workers (50% residents , 50% In-migrant); and
- Scenario 3: 285 resident workers (100% residents).

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<sup>1</sup> Construction employees in over 800 wards were grouped according to the Postcode Districts

Table PLM 1.1 Resident construction worker distribution within 90 min drive time from Paper Mill Lane

<b>Scenario 1: 188 resident workers (66% residents, 34% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.1%	0
Leiston	IP16	0.4%	1
Saxmundham	IP17	0.3%	0
Southwold	IP18	0.1%	0
Halesworth	IP19	0.2%	0
Woodbridge	IP12, IP13	0.9%	2
Felixstowe	IP11	0.3%	1
Ipswich	IP1-IP10	2.9%	6
Stowmarket	IP14	1.2%	2
Diss	IP21, IP22	0.9%	2
Eye	IP23	0.0%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	2.9%	6
Clacton on Sea	CO15, CO16	1.4%	3
Harwich	CO12	0.5%	1
Manningtree	CO11	0.3%	1
Colchester	CO1-CO7	4.3%	8
Sudbury	CO10	1.3%	2
Lowestoft	NR32, NR33	1.5%	3
Beccles	NR34	0.7%	1
Bungay	NR35	0.2%	0
Chelmsford	CM1-CM3	3.1%	6
Witham	CM8	0.8%	1
Bures	CO8	0.1%	0
Braintree	CM7, CM77	1.7%	3
Maldon	CM9	1.0%	2
Newmarket	CB8	0.8%	1
Ely	CB6, CB7	1.6%	3
Thetford	IP24-IP26	1.2%	2
Frinton-on-Sea	CO13	0.2%	0
Norwich	NR1-NR16	6.1%	12
Attleborough	NR17	0.3%	1
Wymondham	NR18	0.4%	1
Haverhill	CB9	0.7%	1
Saffron Walden	CB10, CB11	0.6%	1
Cambridge	CB1-CB25	3.5%	7
Southminster	CM0	0.7%	1
Brentwood	CM13-CM15	1.7%	3
Billericay	CM11, CM12	1.4%	3

<b>Scenario 1: 188 resident workers (66% residents, 34% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	1.0%	2
Harlow	CM17-CM20	2.2%	4
Bishop's Stortford	CM22, CM23	1.2%	2
Sawbridgeworth	CM21	0.2%	0
Stansted	CM24	0.1%	0
Dunmow	CM6	0.7%	1
Ingatstone	CM4	0.4%	1
Ongar	CM5	0.3%	0
Walton on the Naze	CO14	0.1%	0
Great Yarmouth	NR29-NR31	0.8%	2
Upminster	RM14	0.6%	1
Hornchurch	RM11, RM12	1.5%	3
South Ockendon	RM15	0.7%	1
Grays	RM16, RM17	1.6%	3
Romford	RM1-RM7	4.3%	8
Much Hadham	SG10	0.1%	0
Ware	SG11	0.9%	2
Westcliff-on-sea	SS0	0.8%	1
Southend on sea	SS1-SS3	1.4%	3
Stanford-le-hope	SS17	0.8%	2
Rochford	SS4	0.6%	1
Hockley	SS5	0.6%	1
Rayleigh	SS6	0.7%	1
Benfleet	SS7	1.4%	3
Canvey Island	SS8	1.6%	3
Wickford	SS11, SS12	1.0%	2
Basildon	SS13-SS16	2.8%	5
Leigh-on-sea	SS9	1.0%	2
Dagenham	RM9	0.8%	1
Rainham	RM13	1.5%	3
Halstead	CO9	0.8%	2
Gravesend	DA11-DA13	1.1%	2
Sidcup	DA14, DA15	0.6%	1
Belvedere	DA17	0.5%	1
Dartford	DA1, DA2, DA4	1.2%	2
Greenhithe	DA9	0.7%	1
Erith	DA8	0.2%	0
Enfield	EN3	0.8%	1
Waltham Cross	EN7	0.4%	1
Waltham Abbey	EN9	0.8%	2

<b>Scenario 1: 188 resident workers (66% residents, 34% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Loughton	IG10	0.8%	1
Barking	IG11	0.2%	0
Woodford Green	IG8	0.5%	1
Chigwell	IG7	0.3%	1
Ilford	IG1-IG6	1.5%	3
Buckhurst Hill	IG9	0.2%	0
Brandon	IP27	0.4%	1
Dereham	NR19	0.6%	1
March	PE15	0.5%	1
Chatteris	PE16	0.5%	1
St Neot's	PE19	1.1%	2
Wisbech	PE14	0.1%	0
St Ives	PE27	0.2%	0
Huntingdon	PE28, PE29	1.1%	2
King's Lynn	PE32,PE33	0.6%	1
Swaffham	PE37	0.3%	1
Downham Market	PE38	0.4%	1
Tilbury	RM18	1.1%	2
Sandy	SG19	0.7%	1
Baldock	SG7	0.4%	1
Royston	SG8	0.8%	1
Buntingford	SG9	0.2%	0
Bedford	MK44	0.3%	1
Swanley	BR8	0.2%	0
London	E11,E18, E47	1.5%	3
		<b>100%</b>	<b>188</b>

Table PML 1.2 Resident construction worker distribution within 90 min drive time from Paper Mill Lane

<b>Scenario 2: 143 resident workers (50% residents , 50% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.1%	0
Leiston	IP16	0.4%	1
Saxmundham	IP17	0.3%	0
Southwold	IP18	0.1%	0
Halesworth	IP19	0.2%	0
Woodbridge	IP12, IP13	0.9%	1
Felixstowe	IP11	0.3%	0
Ipswich	IP1-IP10	2.9%	4
Stowmarket	IP14	1.2%	2
Diss	IP21, IP22	0.9%	1
Eye	IP23	0.0%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	2.9%	4
Clacton on Sea	CO15, CO16	1.4%	2
Harwich	CO12	0.5%	1
Manningtree	CO11	0.3%	0
Colchester	CO1-CO7	4.3%	6
Sudbury	CO10	1.3%	2
Lowestoft	NR32, NR33	1.5%	2
Beccles	NR34	0.7%	1
Bungay	NR35	0.2%	0
Chelmsford	CM1-CM3	3.1%	4
Witham	CM8	0.8%	1
Bures	CO8	0.1%	0
Braintree	CM7, CM77	1.7%	2
Maldon	CM9	1.0%	1
Newmarket	CB8	0.8%	1
Ely	CB6, CB7	1.6%	2
Thetford	IP24-IP26	1.2%	2
Frinton-on-Sea	CO13	0.2%	0
Norwich	NR1-NR16	6.1%	9
Attleborough	NR17	0.3%	0
Wymondham	NR18	0.4%	0
Haverhill	CB9	0.7%	1
Saffron Walden	CB10, CB11	0.6%	1
Cambridge	CB1-CB25	3.5%	5
Southminster	CM0	0.7%	1
Brentwood	CM13-CM15	1.7%	2
Billericay	CM11, CM12	1.4%	2

<b>Scenario 2: 143 resident workers (50% residents , 50% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	1.0%	1
Harlow	CM17-CM20	2.2%	3
Bishop's Stortford	CM22, CM23	1.2%	2
Sawbridgeworth	CM21	0.2%	0
Stansted	CM24	0.1%	0
Dunmow	CM6	0.7%	1
Ingatestone	CM4	0.4%	1
Ongar	CM5	0.3%	0
Walton on the Naze	CO14	0.1%	0
Great Yarmouth	NR29-NR31	0.8%	1
Upminster	RM14	0.6%	1
Hornchurch	RM11, RM12	1.5%	2
South Ockendon	RM15	0.7%	1
Grays	RM16, RM17	1.6%	2
Romford	RM1-RM7	4.3%	6
Much Hadham	SG10	0.1%	0
Ware	SG11	0.9%	1
Westcliff-on-sea	SS0	0.8%	1
Southend on sea	SS1-SS3	1.4%	2
Stanford-le-hope	SS17	0.8%	1
Rochford	SS4	0.6%	1
Hockley	SS5	0.6%	1
Rayleigh	SS6	0.7%	1
Benfleet	SS7	1.4%	2
Canvey Island	SS8	1.6%	2
Wickford	SS11, SS12	1.0%	1
Basildon	SS13-SS16	2.8%	4
Leigh-on-sea	SS9	1.0%	1
Dagenham	RM9	0.8%	1
Rainham	RM13	1.5%	2
Halstead	CO9	0.8%	1
Gravesend	DA11-DA13	1.1%	2
Sidcup	DA14, DA15	0.6%	1
Belvedere	DA17	0.5%	1
Dartford	DA1, DA2, DA4	1.2%	2
Greenhithe	DA9	0.7%	1
Erith	DA8	0.2%	0
Enfield	EN3	0.8%	1
Waltham Cross	EN7	0.4%	1
Waltham Abbey	EN9	0.8%	1

<b>Scenario 2: 143 resident workers (50% residents , 50% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Loughton	IG10	0.8%	1
Barking	IG11	0.2%	0
Woodford Green	IG8	0.5%	1
Chigwell	IG7	0.3%	0
Ilford	IG1-IG6	1.5%	2
Buckhurst Hill	IG9	0.2%	0
Brandon	IP27	0.4%	1
Dereham	NR19	0.6%	1
March	PE15	0.5%	1
Chatteris	PE16	0.5%	1
St Neot's	PE19	1.1%	2
Wisbech	PE14	0.1%	0
St Ives	PE27	0.2%	0
Huntingdon	PE28, PE29	1.1%	2
King's Lynn	PE32,PE33	0.6%	1
Swaffham	PE37	0.3%	0
Downham Market	PE38	0.4%	1
Tilbury	RM18	1.1%	2
Sandy	SG19	0.7%	1
Baldock	SG7	0.4%	1
Royston	SG8	0.8%	1
Buntingford	SG9	0.2%	0
Bedford	MK44	0.3%	0
Swanley	BR8	0.2%	0
London	E11,E18, E47	1.5%	2
		<b>100%</b>	<b>143</b>



Table PML 1.3 Resident construction worker distribution within 90 min drive time from Paper Mill Lane

<b>Scenario 3: 285 resident workers (100% residents)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.1%	0
Leiston	IP16	0.4%	1
Saxmundham	IP17	0.3%	1
Southwold	IP18	0.1%	0
Halesworth	IP19	0.2%	1
Woodbridge	IP12, IP13	0.9%	3
Felixstowe	IP11	0.3%	1
Ipswich	IP1-IP10	2.9%	8
Stowmarket	IP14	1.2%	3
Diss	IP21, IP22	0.9%	3
Eye	IP23	0.0%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	2.9%	8
Clacton on Sea	CO15, CO16	1.4%	4
Harwich	CO12	0.5%	1
Manningtree	CO11	0.3%	1
Colchester	CO1-CO7	4.3%	12
Sudbury	CO10	1.3%	4
Lowestoft	NR32, NR33	1.5%	4
Beccles	NR34	0.7%	2
Bungay	NR35	0.2%	1
Chelmsford	CM1-CM3	3.1%	9
Witham	CM8	0.8%	2
Bures	CO8	0.1%	0
Braintree	CM7, CM77	1.7%	5
Maldon	CM9	1.0%	3
Newmarket	CB8	0.8%	2
Ely	CB6, CB7	1.6%	5
Thetford	IP24-IP26	1.2%	3
Frinton-on-Sea	CO13	0.2%	1
Norwich	NR1-NR16	6.1%	17
Attleborough	NR17	0.3%	1
Wymondham	NR18	0.4%	1
Haverhill	CB9	0.7%	2
Saffron Walden	CB10, CB11	0.6%	2
Cambridge	CB1-CB25	3.5%	10
Southminster	CM0	0.7%	2
Brentwood	CM13-CM15	1.7%	5
Billericay	CM11, CM12	1.4%	4

<b>Scenario 3: 285 resident workers (100% residents)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	1.0%	3
Harlow	CM17-CM20	2.2%	6
Bishop's Stortford	CM22, CM23	1.2%	3
Sawbridgeworth	CM21	0.2%	1
Stansted	CM24	0.1%	0
Dunmow	CM6	0.7%	2
Ingatestone	CM4	0.4%	1
Ongar	CM5	0.3%	1
Walton on the Naze	CO14	0.1%	0
Great Yarmouth	NR29-NR31	0.8%	2
Upminster	RM14	0.6%	2
Hornchurch	RM11, RM12	1.5%	4
South Ockendon	RM15	0.7%	2
Grays	RM16, RM17	1.6%	5
Romford	RM1-RM7	4.3%	12
Much Hadham	SG10	0.1%	0
Ware	SG11	0.9%	3
Westcliff-on-sea	SS0	0.8%	2
Southend on sea	SS1-SS3	1.4%	4
Stanford-le-hope	SS17	0.8%	2
Rochford	SS4	0.6%	2
Hockley	SS5	0.6%	2
Rayleigh	SS6	0.7%	2
Benfleet	SS7	1.4%	4
Canvey Island	SS8	1.6%	5
Wickford	SS11, SS12	1.0%	3
Basildon	SS13-SS16	2.8%	8
Leigh-on-sea	SS9	1.0%	3
Dagenham	RM9	0.8%	2
Rainham	RM13	1.5%	4
Halstead	CO9	0.8%	2
Gravesend	DA11-DA13	1.1%	3
Sidcup	DA14, DA15	0.6%	2
Belvedere	DA17	0.5%	2
Dartford	DA1, DA2, DA4	1.2%	3
Greenhithe	DA9	0.7%	2
Erith	DA8	0.2%	1
Enfield	EN3	0.8%	2
Waltham Cross	EN7	0.4%	1
Waltham Abbey	EN9	0.8%	2

<b>Scenario 3: 285 resident workers (100% residents)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Loughton	IG10	0.8%	2
Barking	IG11	0.2%	1
Woodford Green	IG8	0.5%	1
Chigwell	IG7	0.3%	1
Ilford	IG1-IG6	1.5%	4
Buckhurst Hill	IG9	0.2%	1
Brandon	IP27	0.4%	1
Dereham	NR19	0.6%	2
March	PE15	0.5%	1
Chatteris	PE16	0.5%	1
St Neot's	PE19	1.1%	3
Wisbech	PE14	0.1%	0
St Ives	PE27	0.2%	0
Huntingdon	PE28, PE29	1.1%	3
King's Lynn	PE32, PE33	0.6%	2
Swaffham	PE37	0.3%	1
Downham Market	PE38	0.4%	1
Tilbury	RM18	1.1%	3
Sandy	SG19	0.7%	2
Baldock	SG7	0.4%	1
Royston	SG8	0.8%	2
Buntingford	SG9	0.2%	1
Bedford	MK44	0.3%	1
Swanley	BR8	0.2%	1
London	E11, E18, E47	1.5%	4
		<b>100%</b>	<b>285</b>

### **Woodbridge**

- Woodbridge is used as the centre point;
- Resident workers are assumed to originate from within a 90 minute drive time of the Woodbridge centre point;
- Resident construction workers are proportionally allocated to areas according to each areas level/ concentration of construction employees (derived from Census 2011 data via PBA GIS).<sup>1</sup>

### **Three scenarios**

- Scenario 1: 188 resident workers (66% residents, 34% In-migrant);
- Scenario 2: 143 resident workers (50% residents, 50% In-migrant); and
- Scenario 3: 285 resident workers (100% residents).

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<sup>1</sup> Construction employees in over 560 wards were grouped according to the Postcode Districts

Table WB 1.1 Resident construction worker distribution within 90 min drive time from Woodbridge

<b>Scenario 1: 188 resident workers (66% residents, 34% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.4%	1
Leiston	IP16	0.6%	1
Saxmundham	IP17	0.4%	1
Southwold	IP18	0.1%	0
Halesworth	IP19	0.3%	1
Woodbridge	IP12, IP13	1.4%	3
Felixstowe	IP11	0.5%	1
Ipswich	IP1-IP10	7.5%	14
Stowmarket	IP14	1.8%	3
Diss	IP21, IP22	1.4%	3
Eye	IP23	0.1%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	3.8%	7
Clacton on Sea	CO15, CO16	2.1%	4
Harwich	CO12	0.8%	2
Manningtree	CO11	0.5%	1
Colchester	CO1-CO7	8.0%	15
Sudbury	CO10	2.0%	4
Lowestoft	NR32, NR33	2.4%	5
Beccles	NR34	0.7%	1
Bungay	NR35	0.3%	1
Chelmsford	CM1-CM3	6.6%	12
Witham	CM8	1.2%	2
Bures	CO8	0.1%	0
Braintree	CM7, CM77	2.6%	5
Maldon	CM9	1.5%	3
Newmarket	CB8	1.2%	2
Ely	CB6, CB7	2.3%	4
Thetford	IP24	0.0%	0
Frinton-on-Sea	CO13	0.4%	1
Norwich	NR1-NR16	4.0%	8
Attleborough	NR17	0.5%	1
Wymondham	NR18	0.1%	0
Haverhill	CB9	1.4%	3
Saffron Walden	CB10, CB11	0.3%	1
Cambridge	CB1-CB25	4.0%	8
Southminster	CM0	0.7%	1
Brentwood	CM13-CM15	2.3%	4
Billericay	CM11, CM12	1.7%	3

<b>Scenario 1: 188 resident workers (66% residents, 34% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	0.6%	1
Harlow	CM17-CM20	1.2%	2
Bishop's Stortford	CM22, CM23	1.9%	4
Sawbridgeworth	CM21	0.3%	1
Stansted	CM24	0.1%	0
Dunmow	CM6	1.2%	2
Ingatestone	CM4	0.6%	1
Ongar	CM5	0.4%	1
Walton on the Naze	CO14	0.2%	0
Great Yarmouth	NR29-NR31	2.1%	4
Upminster	RM14	0.9%	2
Hornchurch	RM11, RM12	0.5%	1
South Ockendon	RM15	1.5%	3
Grays	RM16	0.3%	1
Romford	RM1-RM7	3.1%	6
Much Hadham	SG10	0.2%	0
Ware	SG11	0.2%	0
Westcliff-on-sea	SS0	0.9%	2
Southend on sea	SS1-SS3	1.1%	2
Stanford-le-hope	SS17	1.9%	3
Rochford	SS4	0.9%	2
Hockley	SS5	0.9%	2
Rayleigh	SS6	1.1%	2
Benfleet	SS7	2.3%	4
Canvey Island	SS8	1.5%	3
Wickford	SS11,SS12	1.6%	3
Basildon	SS13-SS16	4.1%	8
Leigh-on-sea	SS9	2.0%	4
		<b>100%</b>	<b>188</b>

Table WB 1.2 Resident construction worker distribution within 90 min drive time from Woodbridge

<b>Scenario 2: 143 resident workers (50% residents, 50% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.4%	1
Leiston	IP16	0.6%	1
Saxmundham	IP17	0.4%	1
Southwold	IP18	0.1%	0
Halesworth	IP19	0.3%	0
Woodbridge	IP12, IP13	1.4%	2
Felixstowe	IP11	0.5%	1
Ipswich	IP1-IP10	7.5%	11
Stowmarket	IP14	1.8%	3
Diss	IP21, IP22	1.4%	2
Eye	IP23	0.1%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	3.8%	5
Clacton on Sea	CO15, CO16	2.1%	3
Harwich	CO12	0.8%	1
Manningtree	CO11	0.5%	1
Colchester	CO1-CO7	8.0%	11
Sudbury	CO10	2.0%	3
Lowestoft	NR32, NR33	2.4%	3
Beccles	NR34	0.7%	1
Bungay	NR35	0.3%	0
Chelmsford	CM1-CM3	6.6%	9
Witham	CM8	1.2%	2
Bures	CO8	0.1%	0
Braintree	CM7, CM77	2.6%	4
Maldon	CM9	1.5%	2
Newmarket	CB8	1.2%	2
Ely	CB6, CB7	2.3%	3
Thetford	IP24	0.0%	0
Frinton-on-Sea	CO13	0.4%	1
Norwich	NR1-NR16	4.0%	6
Attleborough	NR17	0.5%	1
Wymondham	NR18	0.1%	0
Haverhill	CB9	1.4%	2
Saffron Walden	CB10, CB11	0.3%	0
Cambridge	CB1-CB25	4.0%	6
Southminster	CM0	0.7%	1
Brentwood	CM13-CM15	2.3%	3
Billericay	CM11, CM12	1.7%	2

<b>Scenario 2: 143 resident workers (50% residents, 50% In-migrant)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	0.6%	1
Harlow	CM17-CM20	1.2%	2
Bishop's Stortford	CM22, CM23	1.9%	3
Sawbridgeworth	CM21	0.3%	0
Stansted	CM24	0.1%	0
Dunmow	CM6	1.2%	2
Ingatestone	CM4	0.6%	1
Ongar	CM5	0.4%	1
Walton on the Naze	CO14	0.2%	0
Great Yarmouth	NR29-NR31	2.1%	3
Upminster	RM14	0.9%	1
Hornchurch	RM11, RM12	0.5%	1
South Ockendon	RM15	1.5%	2
Grays	RM16	0.3%	0
Romford	RM1-RM7	3.1%	4
Much Hadham	SG10	0.2%	0
Ware	SG11	0.2%	0
Westcliff-on-sea	SS0	0.9%	1
Southend on sea	SS1-SS3	1.1%	2
Stanford-le-hope	SS17	1.9%	3
Rochford	SS4	0.9%	1
Hockley	SS5	0.9%	1
Rayleigh	SS6	1.1%	2
Benfleet	SS7	2.3%	3
Canvey Island	SS8	1.5%	2
Wickford	SS11,SS12	1.6%	2
Basildon	SS13-SS16	4.1%	6
Leigh-on-sea	SS9	2.0%	3
		<b>100%</b>	<b>143</b>



Table WB 1.3 Resident construction worker distribution within 90 min drive time from Woodbridge

<b>Scenario 3: 285 resident workers (100% residents)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Aldeburgh	IP15	0.4%	1
Leiston	IP16	0.6%	1
Saxmundham	IP17	0.4%	1
Southwold	IP18	0.1%	0
Halesworth	IP19	0.3%	0
Woodbridge	IP12, IP13	1.4%	2
Felixstowe	IP11	0.5%	1
Ipswich	IP1-IP10	7.5%	11
Stowmarket	IP14	1.8%	3
Diss	IP21, IP22	1.4%	2
Eye	IP23	0.1%	0
Harleston	IP20	0.4%	1
Bury St Edmunds	IP28-IP33	3.8%	5
Clacton on Sea	CO15, CO16	2.1%	3
Harwich	CO12	0.8%	1
Manningtree	CO11	0.5%	1
Colchester	CO1-CO7	8.0%	11
Sudbury	CO10	2.0%	3
Lowestoft	NR32, NR33	2.4%	3
Beccles	NR34	0.7%	1
Bungay	NR35	0.3%	0
Chelmsford	CM1-CM3	6.6%	9
Witham	CM8	1.2%	2
Bures	CO8	0.1%	0
Braintree	CM7, CM77	2.6%	4
Maldon	CM9	1.5%	2
Newmarket	CB8	1.2%	2
Ely	CB6, CB7	2.3%	3
Thetford	IP24	0.0%	0
Frinton-on-Sea	CO13	0.4%	1
Norwich	NR1-NR16	4.0%	6
Attleborough	NR17	0.5%	1
Wymondham	NR18	0.1%	0
Haverhill	CB9	1.4%	2
Saffron Walden	CB10, CB11	0.3%	0
Cambridge	CB1-CB25	4.0%	6
Southminster	CM0	0.7%	1
Brentwood	CM13-CM15	2.3%	3
Billericay	CM11, CM12	1.7%	2

<b>Scenario 3: 285 resident workers (100% residents)</b>			
<b>Area</b>	<b>Postcode District</b>	<b>% distribution by location (resident workers)</b>	<b>Location of resident workers</b>
Epping	CM16	0.6%	1
Harlow	CM17-CM20	1.2%	2
Bishop's Stortford	CM22, CM23	1.9%	3
Sawbridgeworth	CM21	0.3%	0
Stansted	CM24	0.1%	0
Dunmow	CM6	1.2%	2
Ingatestone	CM4	0.6%	1
Ongar	CM5	0.4%	1
Walton on the Naze	CO14	0.2%	0
Great Yarmouth	NR29-NR31	2.1%	3
Upminster	RM14	0.9%	1
Hornchurch	RM11, RM12	0.5%	1
South Ockendon	RM15	1.5%	2
Grays	RM16	0.3%	0
Romford	RM1-RM7	3.1%	4
Much Hadham	SG10	0.2%	0
Ware	SG11	0.2%	0
Westcliff-on-sea	SS0	0.9%	1
Southend on sea	SS1-SS3	1.1%	2
Stanford-le-hope	SS17	1.9%	3
Rochford	SS4	0.9%	1
Hockley	SS5	0.9%	1
Rayleigh	SS6	1.1%	2
Benfleet	SS7	2.3%	3
Canvey Island	SS8	1.5%	2
Wickford	SS11,SS12	1.6%	2
Basildon	SS13-SS16	4.1%	6
Leigh-on-sea	SS9	2.0%	3
		<b>100%</b>	<b>143</b>

**Appendix 27.16 ends here**