



TECHNICAL NOTE: WAVENEY LOCAL PLAN RESPONSE ON BECCLES TRANSPORT IMPACT ASSESSMENT

QM

Job Number	Date	Author	Checked	Authorised
70029464	10/01/2018	Michael Johns	Matt Chilvers	Matt Chilvers

INTRODUCTION

WAVENEY LOCAL PLAN MODELLING

WSP previously undertook strategic highway modelling using the Suffolk County Transport Model (SCTM) for Waveney District Council to inform consultation on various options presented for the draft Waveney Local Plan. This modelling involved creation of AM peak hour and PM peak assignments for a forecast year of 2036. Three of the scenarios tested included 1,100 dwellings south of Beccles accessing the proposed Beccles Southern Relief Road and Ellough Road, currently referred to as “WLP3.1 - Beccles and Worlingham Garden Suburb” in the Waveney Local Plan.

The following junctions within Beccles were shown to have volume to capacity values of 90-99% in all scenarios and modelled time periods:

- A145 Blyburgate / A145 Peddars Lane
- A146 Norwich Road / Loddon Road

Other junctions shown to have capacity issues in certain peaks and scenarios included the following:

- A145 / Ashman’s Road / Frederick Road
- Gosford Road / Grove Road
- A146 Norwich Road / A143 Yarmouth Road
- George Westwood Way / A143 Yarmouth Road

The SCTM modelling previously carried out for the Local Plan options recommended more detailed modelling or junction modelling is carried out to determine how significant the congestion is at locations identified as being close to or over capacity.

BECCLES TRANSPORT STUDY

Worlingham Parish Council commissioned ASD Engineering to undertake an independent assessment of the traffic and transport impacts associated with proposed Local Plan development in Beccles and Worlingham. The report analysed the transport impacts and issues associated with Local Plan development. The report concluded there were expected to be major impacts in terms of traffic and transportation and question whether the sites in Beccles included as part of the Local Plan are appropriate, particularly the WLP3.1 - Beccles and Worlingham Garden Suburb



development south of Beccles. This technical note provides a response to issues raised within the Beccles Transport Impact Assessment (BTIA).

UPDATED STRATEGIC MODELLING

Waveney District Council has commissioned WSP to undertake further traffic modelling of the “Preferred Option” for the Waveney Local Plan. As part of this further modelling updates have been made to the 2016 base year model which underpins the local plan forecasts. Traffic presented within the BTIA has been utilised as part of the 2016 base year model revalidation. This has been undertaken to add additional detail to the local validation of Beccles within the SCTM.

2017 TRAFFIC COUNT DATA

WSP received the traffic turning count data at the following count locations used within the BTIA:

- Junction 1: Newgate / Station Road / Market Street
- Junction 2: George Westwood Way / Station Road / Gosford Road
- Junction 3: A145 / Peddars Lane / St Marys Road
- Junction 4: Blyburgate / Peddars Lane
- Junction 5: Lowestoft Road

This data was utilised within the SCTM 2016 base year highway model for the AM peak (0800-0900) and PM peak (1700-1800). This traffic data was included in the matrix estimation process to ensure a close level of fit between modelled and observed flows at these junctions. Correction factors were applied to the count data to ensure it was consistent with 2016 traffic levels. Appendix A includes validation performance of these junctions as link based counts for each junction arm and exceeds WebTAG requirements. In the AM peak, 30 of the 31 (97%) link based counts associated with the BTIA turning counts achieve the required level of validation. In the PM peak, 27 of 31 counts (87%) are validated to WebTAG requirements.

TRAFFIC COUNT DATA COMPARISON

Traffic count comparisons were undertaken where alternative data sources were available. Generally alternative data was not available directly in the vicinity of the turning count exit and approach arms, therefore a direct comparison to alternative data source was not possible in the majority of cases. Figure 1 shows the relative location of traffic counts within Beccles.

Appendix B contains a comparison of the BTIA count data to alternative data sources, namely 2016 ATC used to build the SCTM and DfT Traffic Count data. This comparison highlights there are consistency issues with the traffic data. The northern arm of Junction 4 is directly comparable to both a DfT count (46717) and SCTM ATC count (1681 & 1682), this suggests the Junction 4 shows lower traffic compared to the other data sources, however the residential area of Kilbrack / Kilbrack Gardens may explain the flow differences between the count data sources. The DfT count (47569) is located in close proximity to the eastern arm of Junction 3 and western arm of Junction 4. This count location only has data from 2012; therefore traffic behaviour may have changed by 2017 to explain the differences in flows shown between these count sources. It should also be considered the DfT count data only covers a single day observation.

The turning count data from the BTIA represents traffic data from a single day. DfT WebTAG guidance advises long term data such as ATC data laid for a minimum of two weeks is more appropriate for model calibration and validation as an indicator of average traffic conditions. However in the absence of more long term data the BTIA turning count data has been utilised.

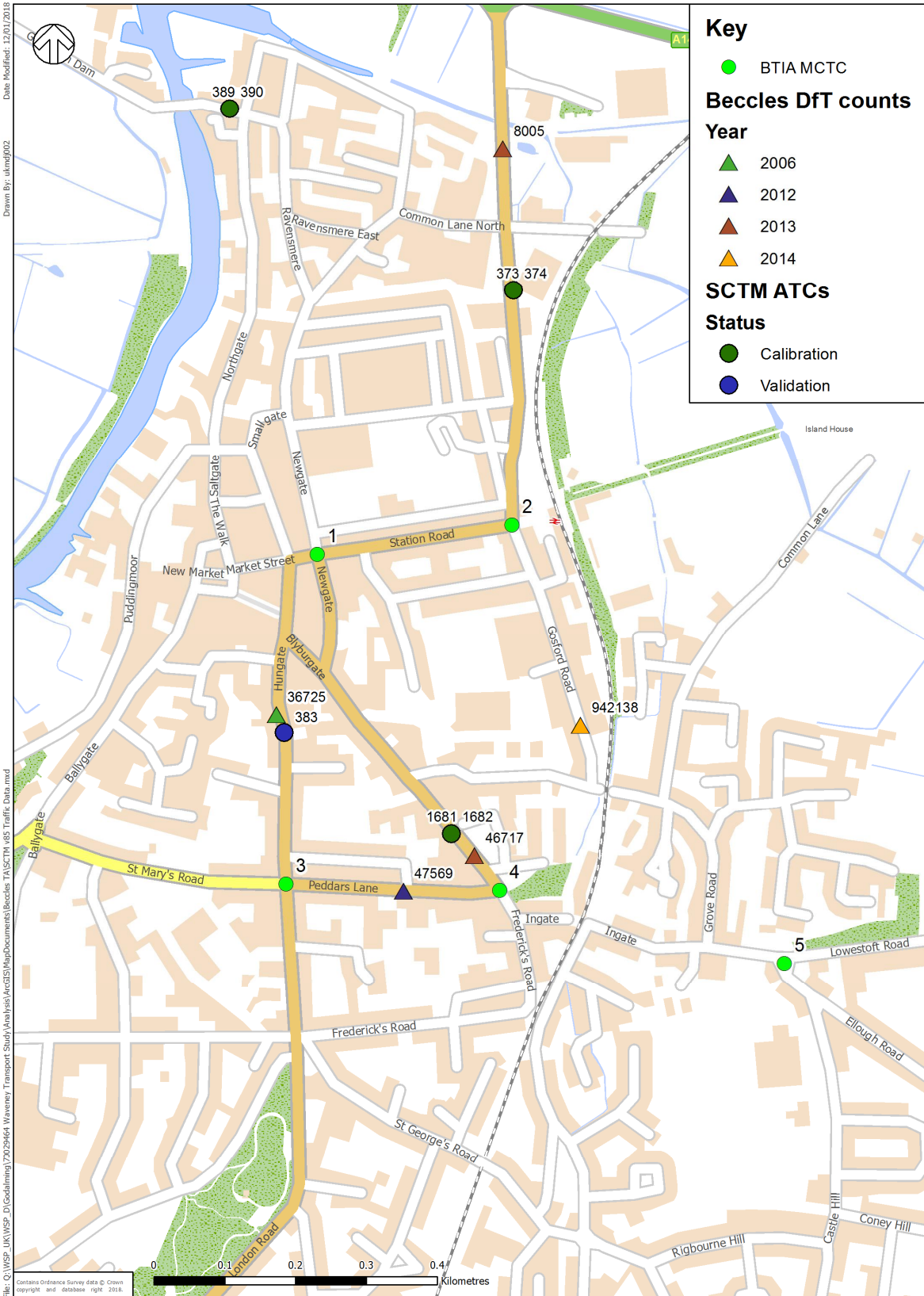


Figure 1 – Beccles traffic data



FURTHER COMMENTS ON BECCLES TRANSPORT IMPACT ASSESSMENT

The remainder of this technical note now provides comments on the methodology undertaken within the BTIA and how it compares to the modelling being undertaken by WSP for the Waveney Local Plan.

TRIP RATES

The trip rates used for the BTIA (Table 1) are noted to be comparable to those used in the SCTM (Table 2) but are higher in terms of departures in the AM peak and arrivals in the PM peak. The trip rates use for the Local Plan assume a split of 65% private housing and 35% affordable housing which is seen as a more realistic representation of the split of housing stock coming forward. The trip rate factors used in the BTIA were based on privately owned housing only at an Edge of Town location using TRICS.

Table 1 – Beccles Transport Impact Assessment – Waveney development trip rates

TEMPRO ZONE / 2011 MSOA	ARRIVALS (TRIP RATES)	DEPARTURES (TRIP RATES)	TWO-WAY (TRIP RATES)
AM Peak	0.099	0.360	0.459
PM Peak	0.366	0.151	0.517

Table 2 – Suffolk County Transport Model – Waveney development trip rates

TEMPRO ZONE / 2011 MSOA	ARRIVALS (TRIP RATES)	DEPARTURES (TRIP RATES)	TWO-WAY (TRIP RATES)
AM Peak	0.1431	0.3444	0.4875
PM Peak	0.30605	0.19395	0.5

TEMPRO TRAFFIC GROWTH

Section 5.6 of the BTIA outlines that 1,350 dwellings have been manually removed from the “Beccles area” within TEMPRO. This is assumed to be the Waveney 010 and Waveney 011 MSOAs as these contain Beccles and Worlingham, these boundaries are shown in Figure 2. However analysis of these MSOAs within TEMPRO 7.2 shows the growth in housing between 2017 and 2036 to be 1,213. This residual difference of 137 dwellings should have been removed from other Waveney MSOAs further afield, if this adjustment is not made then the background traffic growth in TEMPRO will be over-estimated. Also, it is considered that at an MSA level, the underlying data within TEMPRO can be less reliable. Controlling TEMPRO at a district level, which is the approach undertaken within the Local Plan modelling, is considered a preferable approach.



Figure 2 – Waveney 2011 Census MSA boundaries

The TEMPRO growth factors applied in the BTIA are shown in Table 3.

Table 3 – Beccles Transport Impact Assessment – TEMPRO growth factors (2017 to 2036)

TEMPRO ZONE / 2011 MSA	AM PEAK	PM PEAK
2017 to 2036	1.1181	1.1037

Analysis by WSP of the TEMPRO factors with and without adjusting the housing in Waveney 010 and Waveney 011 to base year levels show very different traffic growth factors to those presented in the BTIA, as shown in Table 4 and Table 5. Growth factors should be applied on an origin and destination basis to ensure the appropriate growth in traffic is carried out. This approach has been undertaken when deriving forecast matrices within the SCTM with the matrices furnished using the origin and destination factors. The level of TEMPRO growth included within the BTIA looks to be an over-estimate based on the information provided compared to adjusted TEMPRO factors presented in Table 4 and Table 5, and also potentially based on averaging TEMPRO origin and destination factors.

Table 4 – Adjusted and Unadjusted TEMPRO factors (AM 2017 to 2036)

SPATIAL LEVEL	AM PEAK (0700-1000) – TEMPRO O/D FACTOR		AM PEAK (0700-1000) – ADJUSTED TEMPRO O/D FACTOR (HOUSING SET TO 2017 BASE YEAR LEVELS TO ACCOUNT FOR 1,350 DWELLINGS)	
TEMPRO zone / 2011 MSOA	Origin Factor	Destination Factor	Origin Factor	Destination Factor
Waveney 010	1.1457	1.1768	1.0446	1.1653
Waveney 011	1.065	1.1459	0.9432	1.1217

Table 5 – Adjusted and Unadjusted TEMPRO factors (PM 2017 to 2036)

SPATIAL LEVEL	PM PEAK (1600-1900) – TEMPRO O/D FACTOR		AM PEAK (0700-1000) – ADJUSTED TEMPRO O/D FACTOR (HOUSING SET TO 2017 BASE YEAR LEVELS TO ACCOUNT FOR 1,350 DWELLINGS)	
TEMPRO zone / 2011 MSOA	Origin Factor	Destination Factor	Origin Factor	Destination Factor
Waveney 010	1.1707	1.1474	1.1385	1.0556
Waveney 011	1.1232	1.0717	1.0703	0.9552

TRAFFIC DISTRIBUTION

The modelled network and available routes for traffic to distribute used within the BTIA is considered to be simplistic. The benefit of utilising a county-wide model such as the SCTM is that it includes considerable network detail and the assignment allows for the re-routing of traffic based on congested link times. Key routes affecting routing within Beccles town centre such as Grove Road to Gosford Road, Ballygate to Northgate, Gillingham Dam as well as alternative routes which avoid Ingate are not included in the BTIA network. A comparison of the BTIA and SCTM networks is shown in Figure 3. This simplified network will lead to traffic funnelling onto routes which it in reality may not be used.

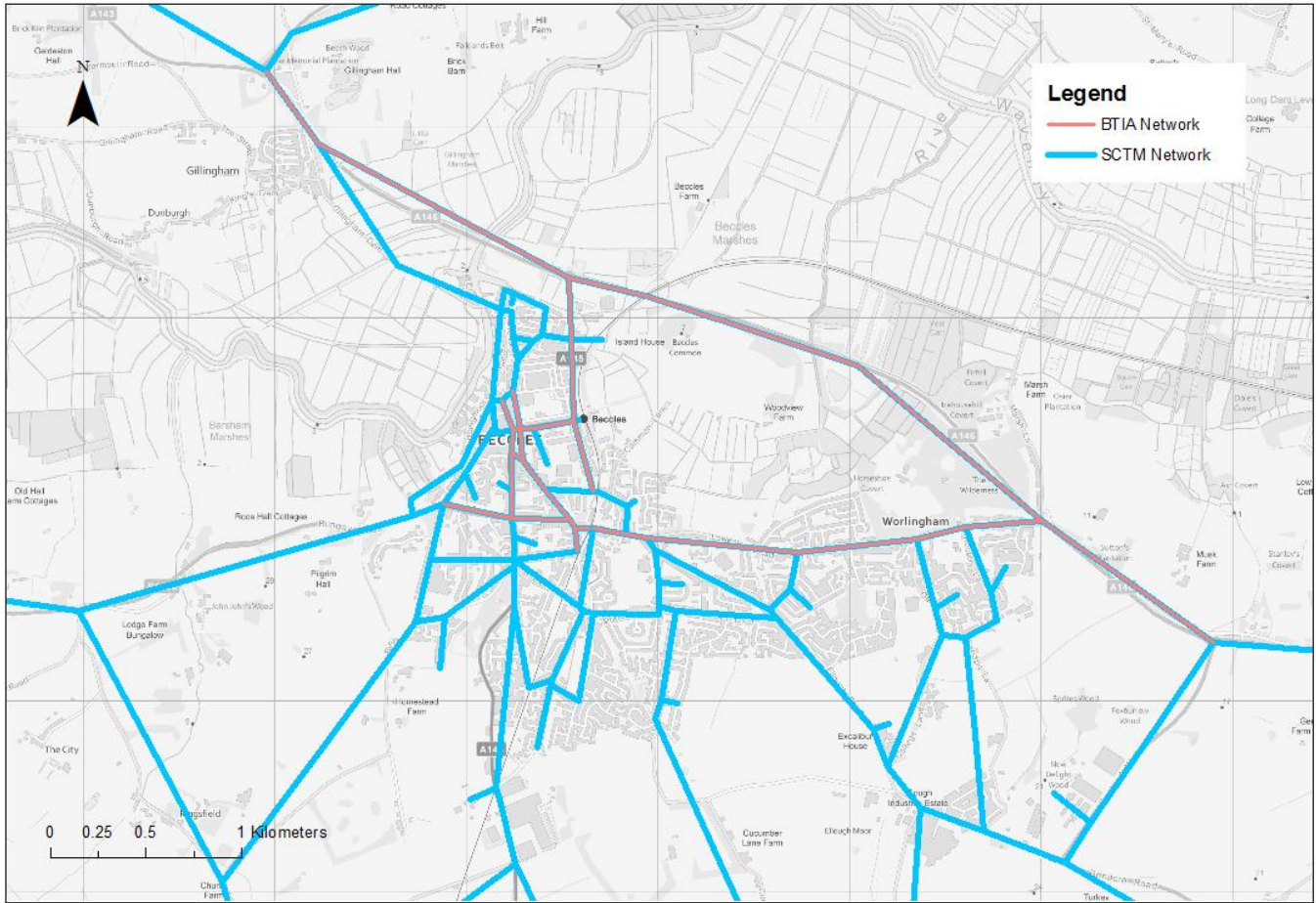


Figure 3 – Comparison of Beccles network detail in SCTM and BTIA

The BTIA shows 66% of westward traffic from the WLP3.1 development routes directly through Beccles town centre. In order to get to westward destinations such as Bungay routes such as the B1062 would be more desirable than driving through town. This is supported by the previous 2036 SCTM assignments provided for the Local Plan scenario assessments. The addendum report which specifically looks at the distribution of traffic from WLP3.1 shows there is no through traffic from this development which uses Beccles town centre. Strategic traffic opts to avoid Beccles town centre to get to the A146 or B1062 Bungay Road. Only traffic which has an origin or destination in Beccles town centres routes to/from this location.

The basis for the distribution of traffic is the Waveney 010 MSOA. This covers an area significantly larger than Beccles town centre and includes several businesses which are not within the town centre such as MH Plastics, Sir John Leman, Beccles Hospital/Medical Centre and primary schools outside of the town centre. Reliance on census data also means a bias towards commuting trips, whereas the mobile phone data used within the SCTM contains distributions for trip movements which are appropriate for business and non-work related journey purpose types by specific time of day.

The assessment within the BTIA does not take account of the reassignment of existing traffic which will be caused by the introduction of the Beccles Southern Relief Road and assumes only trips associated with the WLP3.1 development will use it. As a strategic model the SCTM is able to capture the reassignment of trips which utilise this new infrastructure.



CONCLUSION

This technical note has outlined the traffic count turning data used within the Beccles Transport Impact Assessment (BTIA) has been utilised within the Suffolk County Transport Model (SCTM) in order to update the 2016 base year model. The ability to compare this count data to alternative data sources has been limited and it should be borne in mind this data covers a single day which increases the risk of it not being representative of typical traffic conditions. The validation performance of the SCTM using the turning count data has been presented and close level of fit between modelled and observed flows.

Comments have been provided concerning the methodology undertaken within the BTIA compared to the SCTM. The TEMPRO traffic growth figures which have been presented either lack detail in how they have been derived or have not been applied according to DfT WebTAG guidance on forecast modelling. The network detail and approach taken to distribute traffic is considered to be less detailed than that presented in the SCTM. Key routes affecting routing within Beccles town centre are missing from the BTIA network and the distribution model is overly reliant on census data at an aggregated level. The SCTM is considered a more comprehensive and reliable tool from which to assess the impact of Local Plan proposals given the level of network detail it includes, the detail and complexity of the data from which the distribution of traffic is derived and its compliance with DfT WebTAG guidance. The SCTM is considered a robust tool from which to assess the impact of forecast growth in traffic and will provide detail on potential congestion which may require further analysis from detailed junction modelling.

Appendix A1 - AM Peak Beccles MCTC validation performance

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node
2339	Calibration	Beccles	1a	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	2834-2837	2834	2837
2340	Calibration	Beccles	1b	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	3597-2837	3597	2837
2341	Calibration	Beccles	1b	Newgate (North) / Station Road	Exit	Sep-17	MCC	No	2837-3597	2837	3597
2342	Calibration	Beccles	1c	Newgate (North) / Station Road	Exit	Sep-17	MCC	No	2837-2838	2837	2838
2343	Calibration	Beccles	1d	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	2836-2837	2836	2837
2344	Calibration	Beccles	2a	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	2845-2839	2845	2839
2345	Calibration	Beccles	2a	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-2845	2839	2845
2346	Calibration	Beccles	2b	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	5895-2839	5895	2839
2347	Calibration	Beccles	2b	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-5895	2839	5895
2348	Calibration	Beccles	2c	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	2840-2839	2840	2839
2349	Calibration	Beccles	2c	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-2840	2839	2840
2350	Calibration	Beccles	2d	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	3597-2839	3597	2839
2351	Calibration	Beccles	2d	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-3597	2839	3597
2352	Calibration	Beccles	3a	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	3998-2824	3998	2824
2353	Calibration	Beccles	3a	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-3998	2824	3998
2356	Calibration	Beccles	3c	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	3592-2824	3592	2824
2357	Calibration	Beccles	3c	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-3592	2824	3592
2358	Calibration	Beccles	3d	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	2826-2824	2826	2824
2359	Calibration	Beccles	3d	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-2826	2824	2826
2360	Calibration	Beccles	4a	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2825-2823	2825	2823
2361	Calibration	Beccles	4a	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2825	2823	2825
2362	Calibration	Beccles	4b	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2822-2823	2822	2823
2363	Calibration	Beccles	4b	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2822	2823	2822
2364	Calibration	Beccles	4c	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2824-2823	2824	2823
2365	Calibration	Beccles	4c	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2824	2823	2824
2366	Calibration	Beccles	5a	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2807-2804	2807	2804
2367	Calibration	Beccles	5a	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2807	2804	2807
2368	Calibration	Beccles	5b	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2803-2804	2803	2804
2369	Calibration	Beccles	5b	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2803	2804	2803
2370	Calibration	Beccles	5c	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2805-2804	2805	2804
2371	Calibration	Beccles	5c	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2805	2804	2805

ALL VEHICLES					CAR					LGV			HGV		
Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
238	219	1.244	Yes	Yes	218	199	1.276	Yes	Yes	20	20	0.095	0	0	0.295
364	303	3.352	Yes	Yes	323	276	2.720	Yes	Yes	36	22	2.682	5	5	0.119
315	319	0.215	Yes	Yes	276	280	0.211	Yes	Yes	37	37	0.021	2	2	0.118
524	436	4.037	Yes	Yes	467	401	3.148	Yes	Yes	52	29	3.630	5	5	0.113
238	233	0.358	Yes	Yes	203	206	0.206	Yes	Yes	33	24	1.608	2	2	0.124
394	395	0.028	Yes	Yes	345	345	0.017	Yes	Yes	43	43	0.038	7	7	0.004
336	340	0.220	Yes	Yes	289	293	0.206	Yes	Yes	45	45	0.047	2	2	0.141
4	2	0.965	Yes	Yes	4	2	0.965	Yes	Yes	0	0	0.000	0	0	0.000
31	31	0.052	Yes	Yes	31	31	0.052	Yes	Yes	0	0	0.000	0	0	0.000
187	181	0.430	Yes	Yes	169	169	0.029	Yes	Yes	17	12	1.445	0	0	0.437
150	169	1.460	Yes	Yes	134	150	1.373	Yes	Yes	14	16	0.526	3	3	0.042
311	314	0.135	Yes	Yes	270	274	0.211	Yes	Yes	39	38	0.209	2	2	0.129
380	352	1.428	Yes	Yes	335	316	1.020	Yes	Yes	41	32	1.477	4	4	0.003
102	98	0.364	Yes	Yes	95	91	0.403	Yes	Yes	7	7	0.080	0	0	0.295
214	223	0.638	Yes	Yes	197	200	0.179	Yes	Yes	13	20	1.836	4	3	0.268
177	181	0.273	Yes	Yes	158	161	0.234	Yes	Yes	17	17	0.121	2	2	0.138
149	144	0.388	Yes	Yes	129	129	0.058	Yes	Yes	19	14	1.283	1	1	0.113
338	308	1.672	Yes	Yes	310	280	1.727	Yes	Yes	23	23	0.057	5	5	0.052
263	252	0.716	Yes	Yes	244	236	0.485	Yes	Yes	15	11	0.996	5	5	0.191
320	323	0.122	Yes	Yes	290	300	0.580	Yes	Yes	23	19	0.912	7	3	1.580
271	268	0.147	Yes	Yes	239	237	0.098	Yes	Yes	26	26	0.076	6	5	0.215
402	435	1.581	Yes	Yes	360	392	1.678	Yes	Yes	35	35	0.013	8	8	0.040
461	457	0.199	Yes	Yes	427	423	0.200	Yes	Yes	30	30	0.020	4	4	0.018
285	244	2.527	Yes	Yes	266	224	2.704	Yes	Yes	17	16	0.436	1	4	1.914
276	276	0.006	Yes	Yes	251	256	0.362	Yes	Yes	19	14	1.359	6	6	0.049
596	489	4.620	Yes	No	543	441	4.572	Yes	No	43	38	0.668	11	9	0.609
576	475	4.413	Yes	No	516	420	4.448	Yes	Yes	53	48	0.698	7	7	0.004
262	196	4.324	Yes	Yes	232	166	4.627	Yes	Yes	27	27	0.048	3	3	0.047
229	155	5.348	No	Yes	213	140	5.499	No	Yes	12	12	0.100	4	3	0.727
614	610	0.167	Yes	Yes	555	551	0.152	Yes	Yes	51	51	0.067	8	8	0.024
667	665	0.078	Yes	Yes	600	599	0.043	Yes	Yes	56	56	0.046	11	10	0.185

Appendix A2 - PM Peak Beccles MCTC validation performance

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node
2339	Calibration	Beccles	1a	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	2834-2837	2834	2837
2340	Calibration	Beccles	1b	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	3597-2837	3597	2837
2341	Calibration	Beccles	1b	Newgate (North) / Station Road	Exit	Sep-17	MCC	No	2837-3597	2837	3597
2342	Calibration	Beccles	1c	Newgate (North) / Station Road	Exit	Sep-17	MCC	No	2837-2838	2837	2838
2343	Calibration	Beccles	1d	Newgate (North) / Station Road	pproac	Sep-17	MCC	No	2836-2837	2836	2837
2344	Calibration	Beccles	2a	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	2845-2839	2845	2839
2345	Calibration	Beccles	2a	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-2845	2839	2845
2346	Calibration	Beccles	2b	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	5895-2839	5895	2839
2347	Calibration	Beccles	2b	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-5895	2839	5895
2348	Calibration	Beccles	2c	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	2840-2839	2840	2839
2349	Calibration	Beccles	2c	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-2840	2839	2840
2350	Calibration	Beccles	2d	George Westwood Way / Station Road (East)	pproac	Sep-17	MCC	No	3597-2839	3597	2839
2351	Calibration	Beccles	2d	George Westwood Way / Station Road (East)	Exit	Sep-17	MCC	No	2839-3597	2839	3597
2352	Calibration	Beccles	3a	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	3998-2824	3998	2824
2353	Calibration	Beccles	3a	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-3998	2824	3998
2356	Calibration	Beccles	3c	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	3592-2824	3592	2824
2357	Calibration	Beccles	3c	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-3592	2824	3592
2358	Calibration	Beccles	3d	A145 (North) / Peddars Lane	pproac	Sep-17	MCC	No	2826-2824	2826	2824
2359	Calibration	Beccles	3d	A145 (North) / Peddars Lane	Exit	Sep-17	MCC	No	2824-2826	2824	2826
2360	Calibration	Beccles	4a	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2825-2823	2825	2823
2361	Calibration	Beccles	4a	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2825	2823	2825
2362	Calibration	Beccles	4b	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2822-2823	2822	2823
2363	Calibration	Beccles	4b	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2822	2823	2822
2364	Calibration	Beccles	4c	Blyburgate (North) / Blyburgate (South)	pproac	Sep-17	MCC	No	2824-2823	2824	2823
2365	Calibration	Beccles	4c	Blyburgate (North) / Blyburgate (South)	Exit	Sep-17	MCC	No	2823-2824	2823	2824
2366	Calibration	Beccles	5a	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2807-2804	2807	2804
2367	Calibration	Beccles	5a	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2807	2804	2807
2368	Calibration	Beccles	5b	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2803-2804	2803	2804
2369	Calibration	Beccles	5b	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2803	2804	2803
2370	Calibration	Beccles	5c	Lowestoft Road / Ellough Road	pproac	Sep-17	MCC	No	2805-2804	2805	2804
2371	Calibration	Beccles	5c	Lowestoft Road / Ellough Road	Exit	Sep-17	MCC	No	2804-2805	2804	2805

ALL VEHICLES					CAR					LGV			HGV		
Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
202	115	6.875	No	Yes	195	107	7.161	No	Yes	7	8	0.511	0	0	0.295
346	343	0.164	Yes	Yes	318	315	0.154	Yes	Yes	26	26	0.090	2	2	0.103
293	293	0.006	Yes	Yes	266	266	0.014	Yes	Yes	26	26	0.040	1	1	0.122
469	378	4.409	Yes	Yes	436	345	4.629	Yes	Yes	31	32	0.098	2	2	0.112
214	212	0.090	Yes	Yes	188	188	0.036	Yes	Yes	24	24	0.142	1	1	0.122
362	364	0.077	Yes	Yes	332	333	0.063	Yes	Yes	28	28	0.004	2	2	0.208
298	332	1.952	Yes	Yes	273	299	1.564	Yes	Yes	24	33	1.552	1	1	0.067
26	26	0.046	Yes	Yes	26	26	0.046	Yes	Yes	0	0	0.000	0	0	0.000
12	12	0.028	Yes	Yes	12	12	0.028	Yes	Yes	0	0	0.000	0	0	0.000
163	163	0.002	Yes	Yes	154	154	0.032	Yes	Yes	10	9	0.170	0	0	0.544
184	240	3.819	Yes	Yes	167	222	3.930	Yes	Yes	17	17	0.121	0	0	0.639
293	293	0.008	Yes	Yes	263	263	0.024	Yes	Yes	29	29	0.024	1	1	0.122
350	262	5.056	No	Yes	322	243	4.715	Yes	Yes	26	17	2.028	2	2	0.135
48	51	0.446	Yes	Yes	47	47	0.063	Yes	Yes	1	4	1.748	0	0	0.295
161	162	0.077	Yes	Yes	145	145	0.030	Yes	Yes	17	17	0.112	0	0	0.567
125	125	0.053	Yes	Yes	112	112	0.005	Yes	Yes	13	13	0.107	0	0	0.567
140	131	0.735	Yes	Yes	131	127	0.362	Yes	Yes	9	4	1.772	0	0	0.373
371	317	2.951	Yes	Yes	357	300	3.108	Yes	Yes	14	15	0.332	1	1	0.322
290	144	9.877	No	No	272	125	10.381	No	No	17	17	0.112	2	2	0.135
369	304	3.507	Yes	Yes	317	273	2.587	Yes	Yes	51	31	3.105	1	1	0.122
256	256	0.043	Yes	Yes	238	238	0.005	Yes	Yes	17	17	0.121	1	1	0.122
414	380	1.675	Yes	Yes	385	341	2.309	Yes	Yes	26	37	1.870	3	3	0.047
483	484	0.049	Yes	Yes	437	438	0.039	Yes	Yes	44	44	0.009	2	2	0.138
291	260	1.879	Yes	Yes	277	245	1.979	Yes	Yes	14	14	0.116	1	1	0.304
334	205	7.873	No	No	303	182	7.771	No	No	29	21	1.689	2	2	0.144
444	358	4.314	Yes	Yes	402	320	4.328	Yes	Yes	38	34	0.576	4	3	0.351
462	386	3.713	Yes	Yes	419	348	3.648	Yes	Yes	39	34	0.739	4	3	0.265
185	165	1.466	Yes	Yes	162	142	1.556	Yes	Yes	21	21	0.091	2	2	0.138
245	215	1.972	Yes	Yes	233	202	2.069	Yes	Yes	12	12	0.106	0	0	0.746
528	529	0.025	Yes	Yes	489	489	0.019	Yes	Yes	37	37	0.015	3	3	0.047
451	452	0.051	Yes	Yes	400	401	0.046	Yes	Yes	46	46	0.047	5	5	0.070

Appendix B - Traffic count data comparison

			Observed													SCTM ATCs															
			AM Peak					PM Peak								AM Peak					PM Peak					AM Peak	PM Peak				
			TOTAL	CAR	LGV	HGV	BUS	TOTAL	CAR	LGV	HGV	BUS				TOTAL	CAR	LGV	HGV	BUS	TOTAL	CAR	LGV	HGV	BUS	AM Peak	PM Peak				
ID	Road	Direction	Observed	0	Observed	Observed	Observed	Observed	0	Observed	Observed	Observed	ID	Road	Direction	SCTM ATCs	0	SCTM ATCs	SCTM ATCs	SCTM ATCs	SCTM ATCs	SCTM ATCs	0	SCTM ATCs	SCTM ATCs	SCTM ATCs	Diff	Diff			
J2 North Arm NB	J2 North Arm	NB	341	292	46	2	1	302	275	25	1	1	J2 North Arm N2	North Arm	NB	418	341	58	19				542	471	59	11	-19%	-44%			
J2 North Arm SB	J2 North Arm	SB	399	348	44	7	0	366	335	29	2	0	J2 North Arm S2	North Arm	SB	429	350	59	20				547	479	60	8	-7%	-33%			
J4 North Arm NB	J4 North Arm	NB	275	241	27	6	1	263	240	18	1	4	J4 North Arm N4	North Arm	NB	391	317	54	20				438	380	48	10	-30%	-40%			
J4 North Arm SB	J4 North Arm	SB	326	293	24	7	2	376	320	52	1	3	J4 North Arm S4	North Arm	SB	306	248	42	16				418	362	46	10	6%	-10%			
			Observed													DIT Counts															
			AM Peak					PM Peak								AM Peak					PM Peak					AM Peak	PM Peak				
			TOTAL	CAR	LGV	HGV	BUS	TOTAL	CAR	LGV	HGV	BUS	ID	Road	Direction	TOTAL	CAR	LGV	HGV	BUS	TOTAL	CAR	LGV	HGV	BUS	Year	Diff	Diff			
J2 South Arm NB	J2 South Arm	NB	189	171	18	0	0	165	155	10	0	0	J2 South Arm N2	South Arm	NB	185	160	24	0	1				142	124	18	0	0	2014	2%	16%
J2 South Arm SB	J2 South Arm	SB	152	135	14	3	0	186	169	17	0	0	J2 South Arm S2	South Arm	SB	154	123	29	1	1				329	291	36	2	0	2014	-1%	-43%
J2 North Arm NB	J2 North Arm	NB	341	292	46	2	1	302	275	25	1	1	J2 North Arm N2	North Arm	NB	391	318	62	7	4				518	476	40	2	0	2013	-13%	-42%
J2 North Arm SB	J2 North Arm	SB	399	348	44	7	0	366	335	29	2	0	J2 North Arm S2	North Arm	SB	616	514	71	27	4				551	501	42	7	1	2013	-35%	-34%
J3 East Arm EB	J3 East Arm	EB	284	260	22	2	0	295	281	13	1	0	J3 East Arm E3	East Arm	EB	233	195	19	3	16				312	275	28	2	7	2012	22%	-5%
J3 East Arm WB	J3 East Arm	WB	301	266	22	5	8	345	313	28	2	2	J3 East Arm W3	East Arm	WB	485	360	83	29	13				376	345	26	4	1	2012	-38%	-8%
J4 North Arm NB	J4 North Arm	NB	275	241	27	6	1	263	240	18	1	4	J4 North Arm N4	North Arm	NB	346	301	35	2	8				324	285	30	1	8	2013	-21%	-19%
J4 North Arm SB	J4 North Arm	SB	326	293	24	7	2	376	320	52	1	3	J4 North Arm S4	North Arm	SB	237	182	32	17	6				392	334	45	5	8	2013	38%	-4%
J4 West Arm EB	J4 West Arm	EB	288	269	18	1	0	294	279	14	1	0	J4 West Arm E4	West Arm	EB	233	195	19	3	16				312	275	28	2	7	2012	24%	-6%
J4 West Arm WB	J4 West Arm	WB	289	253	20	6	10	340	306	30	2	2	J4 West Arm W4	West Arm	WB	485	360	83	29	13				376	345	26	4	1	2012	-40%	-10%