AECOM

Suffolk County Council

A12 Four Villages - Sizewell C Traffic Impacts

February 2013

Project:	**A12 Four Villages Study**	Job No:	**60285100**
Subject:	**Traffic Impacts of Sizewell C Development**		
Prepared by:	**Mark Chadwick, Bil Harrison and Jameel Hayat**	Date:	**05/02/2013**
Checked and approved by:	**Ian Burrows**	Date:	**05/02/2013**

1. Introduction

This note has been prepared in support of Suffolk County Council's (SCC) response to the EDFE Consultation for a proposed new nuclear power station, Sizewell C.

The objective of the commission is to review the traffic impacts of the proposals on the A12 Woodbridge to Lowestoft route through the four Suffolk villages of Marlesford, Little Glemham, Stratford St Andrew and Farnham and the extent to which these are ameliorated by improvements to the A12, specifically a bypass that removes the significant level of development traffic from the four villages.

This is primarily a review and update of work previously undertaken by AECOM, making use of updated data from SCC and forecasts from EDFE.

The A12 is a multi-purpose route, providing a strategic link between Ipswich and the south with the towns of Great Yarmouth and Lowestoft, and with a series of smaller market and coastal towns and villages to the north. It is a key commuter route, allowing those working in Woodbridge and Ipswich to live in the rural hinterland. It is a vital link in serving the tourist and leisure activities of the region, and of the Norfolk Broads area further north. It also provides an important road link between the communities and businesses in its corridor. The overall economic vitality of East Suffolk is highly dependent on movement along the A12, and the A12's importance to national supply chains has been recognised by the Government (Suffolk's Local Economic Assessment, 2011).

Furthermore, given perceptions that north east Suffolk is an area of weak economic performance and high social need and that transport links are vital to achieving longer term economic development and regeneration objectives for the area, any impact on traffic movement along the A12 is likely to raise serious concerns amongst stakeholders.

In 1995 a full dual carriageway bypass scheme was taken successfully through Public Inquiry, but subsequently removed from the spending programme in early 1996 due to national funding constraints.

In June 2001 the A12 was 'detrunked' between the A14 Seven Hills Interchange near Ipswich and the A146 Junction in Lowestoft, with responsibility for that part of the A12 transferring from the Highways Agency to SCC.

Following this, SCC commissioned a series of reviews in 2004 and 2005, which suggested that while the justification for a bypass held up on traffic cost and benefit terms, the national shift towards sustainable transport major schemes and the introduction of regionally determined priorities for funding meant that the prospects for justifying a full bypass, and securing its funding, were diminishing.

Within this context AECOM (then Faber Maunsell) and The Landscape Partnership (TLP) were commissioned in 2006 to re-examine, evaluate and quantify the transport issues and traffic problems in the area around the four villages; engage with the local community to understand concerns and needs; develop a wide range of transport intervention options to address identified problems; examine potential environmental impacts of a full set of interventions, both on-line and off-line; undertake a largely qualitative appraisal of the interventions but broadly following NATA guidance; and recommend a way forward. The results were summarised in the 'A12 Four Villages Study Final Report' (December 2006).

Although a priority for SCC, funding was not forthcoming in the Regional Prioritisation process, even though the 2006 Study identified strong business cases for a range of interventions, including full bypasses to the four villages, based on the prevailing assumptions and traffic forecasts available at that time.

The study identified short, medium and long term solutions, with a full bypass providing the best solution. Traffic levels have decreased since 2006, partly reflecting national trends as the economy has contracted. The earlier studies and the successful Planning Inquiry did nevertheless demonstrate the feasibility, deliverability and value for money of a bypass for a given level of traffic growth.

Within this context, it is essential to understand the level and nature of development traffic on top of the revised forecasts in background traffic. Although the latter have been revised downwards, the significant level of development traffic required for Sizewell C is expected to increase traffic levels to those necessitating a bypass, in particular when taking into account the increased proportion of HGVs.

This note sets out the analysis of current and forecast traffic conditions with and without the development, providing a high level update of the 2006 Study with respect to traffic, journey times, accidents and air quality and the case for a bypass to relieve the pressure on the A12 as a result of the construction of Sizewell C.

Section 2 provides a brief synopsis of current traffic conditions on the A12 through the Four Villages regarding: traffic volumes; journey times; the relationship between traffic volume and speed; accidents; and air quality. Section 3 goes through similar themes for forecast traffic conditions on the A12, assuming the development goes ahead. Section 4 sets out the forecast conditions assuming the development goes ahead and assuming a bypass is built to mitigate the impacts of the increases traffic levels. Section 5 updates the Appraisal Summary Tables from the 2006 Study. Section 6 sets out the main conclusions.

2. Current Conditions

Introduction

This section summarises current traffic conditions on the A12 through the four villages. It draws on recent data to update the previous study where available.

Traffic

The traffic levels on the A12 through the four villages are monitored continuously using the SCC traffic counter Y141, located at the River Alde Bridge in Stratford St Andrew. This enables the changes from the surveys in 2006 to be inferred.

We have been provided with complete year's data for the A12 continuous site at Farnham for 2006 and 2012. In the 2006 assessment, ATC data were only available for first 8 months of the year and hence the AADT (annual average daily traffic) figure for that year has changed marginally from that reported of 16,500 to 16,637.

Traffic since 2006 has decreased by 6.7% to 15,529 in 2012. The 2006 study had assumed a low growth rate of 1% per annum, but even this has not been realised, reflecting national trends of a slow down or in some cases a small decline in traffic levels. Nevertheless, traffic levels are still higher than those in the late 1980s and early 1990s when studies first identified the need for a bypass:

	AADT
• 1988:	12,000
• 1994:	13,500
• 2006:	16,500
• 2012:	15,529

The successful 1995 Public Inquiry had assumed an opening year of 1999 with traffic levels of 15,500, slightly less than the current traffic levels.

Vehicle proportions in 2012 are similar to those in 2006 although the class 3 (Rigid Lorry) proportion has reduced whilst class 2 has increased, probably reflecting changes in the vehicle fleet (see **Table 1**). The overall HGV proportion has reduced from 4.7% to 4.3%. It is possible that some class 2 vehicles have been classified as OGV1 (e.g. 4 tyres on rear axle).

Table 1: Vehicle Proportions

Vehicle	2006	2012
1 Car, Car+T, Lt. Van	89.9%	89.7%
2 Heavy Van, Mini bus	5.1%	5.7%
3 Rigid Lorry	2.6%	2.2%
4 Rigid Lorry+T, Artic.	2.1%	2.1%
5 Bus, Coach	0.3%	0.3%

Examination of the traffic patterns confirms the strong weekday diurnal pattern of commuting traffic towards employment in Ipswich and Woodbridge, peaking on a Friday afternoon northbound.

Summer Saturday traffic levels are 118% of AADT. In summer, traffic on the busy changeover Saturday builds up to a peak in both directions in the middle of the day. On the busy Saturdays in August, the flow reaches 18300 vehicles per day.

There is extensive anecdotal evidence of the queuing and delays to side roads joining and crossing traffic during periods of high flow on the A12, and right turning traffic has been a cause of hold-ups, frustration and accidents[1].

The mixed use of the road by agricultural and goods vehicles, and the limited overtaking opportunities, results in frequent slow moving queues of traffic. Additional development traffic will exacerbate this situation, and will be particularly acute during peak periods and holidays (with concomitant impacts on the tourist industry). During such times there will be a large proportion of development traffic and tourist traffic unfamiliar with the road layout and impacts would be expected to be greater than simple traffic impact assessments will predict.

Journey Times

The A12 through the four villages is covered by a series of speed limits, including:

- Wickham Market Bypass 70mph to 60mph/40mph, 400m east
- 40/30mph just east of Keeper's Lane – Little Glemham – 400m to 2200m
- 30/50mph 200m north of Church Road – Little Glemham, 2200 to 2800m
- 50/30mph immediately west of Stratford St Andrew, 2800m to 5300m
- 30/50mph immediately north of Farnham, 5300m to 6100m
- 50/70mph at A1094 junction, 6100m to 6900m

These are generally at least partly respected by the largely regular users of the route, but anecdotally there is evidence speeding can be a problem at periods of low flow; on the other hand, there is aggressive tailgating of those respecting the speed limit.

TrafficMaster data were provided for the 5.9km section from the Marlesford Road junction to the Park Road junction. Accounting for speed limits, the free flow time along this section would be 5.5 minutes (65.5kph) minutes compared to 6.2 minutes (67.2kph) for the 6.9km section from the end of the Wickham Market Bypass to the A1094 junction.

Data were analysed for September 2012 weekdays (see **Figure 1** and **Figure 2**). There seems to be some relationship between traffic volume and speed, more so for southbound than northbound traffic. Note that due to existing speed limits, the HGV restriction to 40mph on single carriageway roads will have little impact on speeds through the Four Villages section of route.

[1] See also A12 Four Villages Study Final Report' (December 2006) pg. 12 and pg. 23.

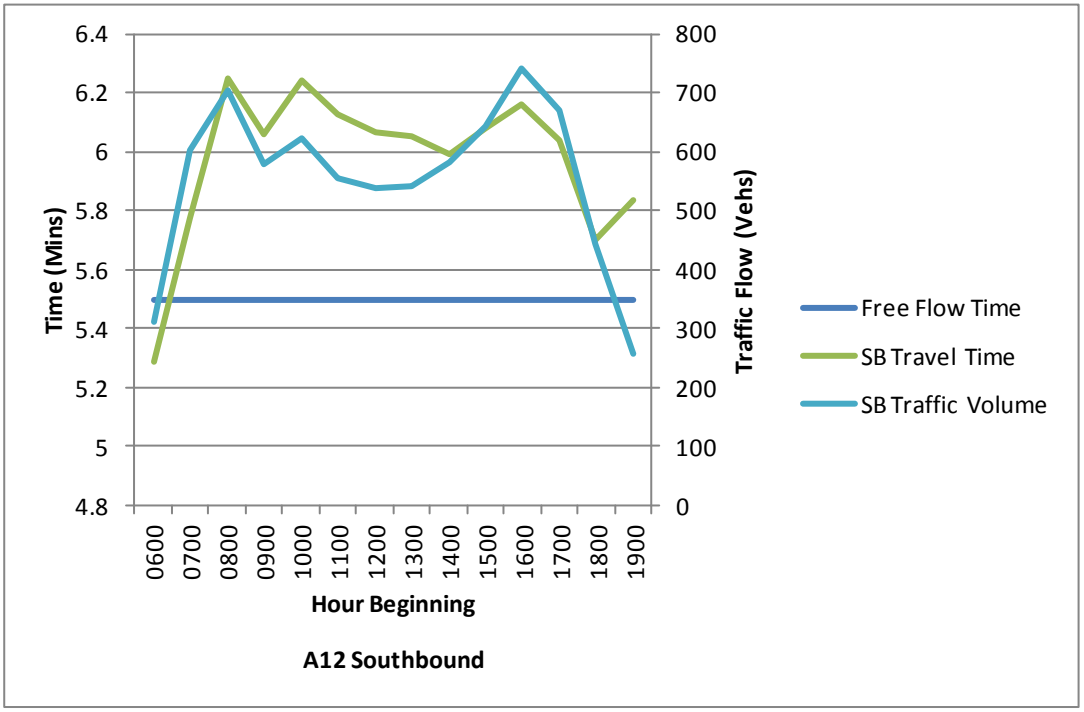

Figure 1: Southbound traffic levels, free flow time and travel time

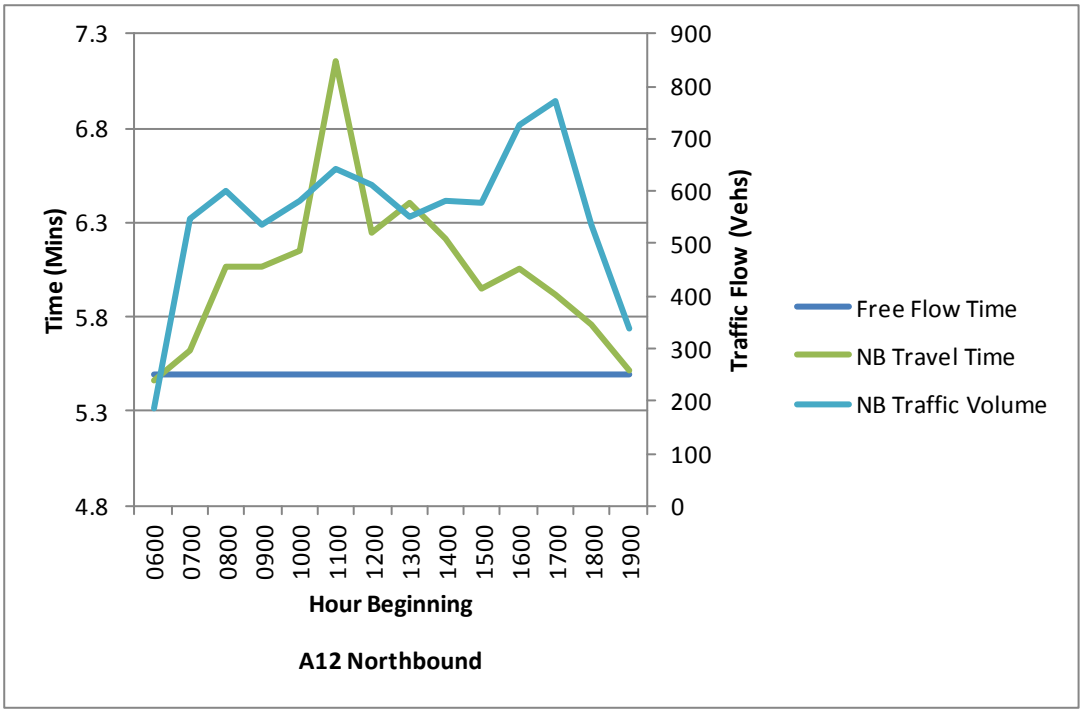

Figure 2: Northbound traffic levels, free flow time and travel time

Speed flow relationship
Based on available TrafficMaster data a speed-flow relationship for the A12 through the Four Villages has been calculated as follows:

Speed (kph) = 68.35 - 0.0142*(Traffic Flow)

Where *Traffic Flow* is the volume of traffic per hour per direction.

From the TrafficMaster data it was observed that beyond 800-1000 vehicles per hour journey times can increase significantly, consistent with the normal parabolic speed-flow curves that are observed in practice with high vehicle flows as capacity is reached and exceeded. There is an absolute limit on the existing road of about 1,100 to 1,200.

This speed-flow relationship is applicable up to traffic volumes of 850 vehicles per hour (vph). At traffic flows above 850 vph (or the 'breakpoint' flow) the COBA formula has been applied. **Figure 3** indicates the speed-flow curve applicable to the existing A12 through the Four Villages.

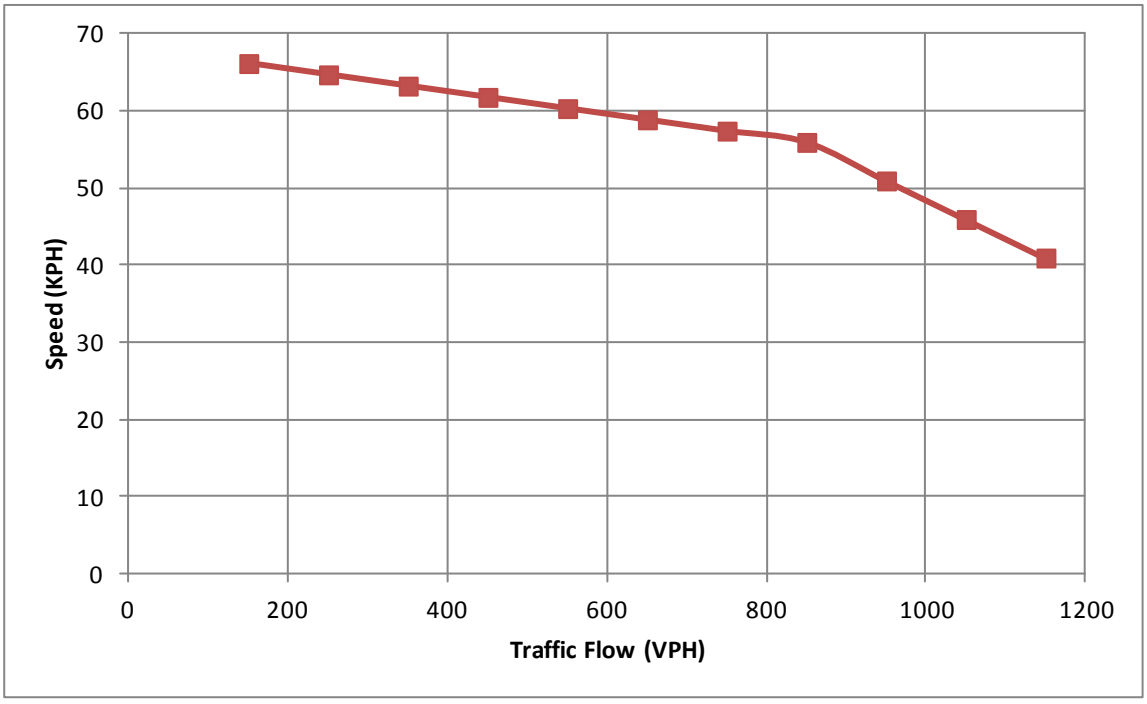

Figure 3: Existing A12 Speed-Flow Relationship

Accidents
Apart from the summer peak periods, most of the traffic consists of regular users, familiar with the layout and junctions. This results in the road displaying a relatively average accident rate, despite its often poor alignment and sightlines. Anecdotal evidence suggests a relatively high level of unreported damage only accidents at the frequent busy junctions.

SCC have provided accident data for the 6.9km section from end of Wickham Market Bypass to A1094 junction for 3 complete years from 1 October 2009 to 30 September 2012. These data gave 22 accidents and 32 casualties over the 3 year period with 29 slight injuries, 3 serious injuries, and no fatalities.

The annual accident rate of 7.3 accidents is only half the rate that was observed over the 4 years between 2002 and 2005 when 60 accidents were recorded, or 15 per annum. The new accident rate (assuming the same AADT for the 3 year period) is 0.19 accidents per million vehicle miles whereas the previously calculated rate was 0.31.

Nevertheless, there are a large number of damage only collisions along the A12 between Wickham Market and Saxmundham. An increase in the proportion of drivers unfamiliar with the road layout combined with an overall increase in traffic may not only increase the number of damage only collisions but may result in a proportion of these actually becoming more severe resulting in injuries.

Air Quality

All four villages are divided by the A12, with sensitive properties adjacent to the through route. There are already two Air Quality Management Areas (AQMAs) in Suffolk Coastal District Council (SCDC), one near the Port of Felixstowe (the AQMA came into effect in 2009) and one in Woodbridge (the AQMA came into effect in 2006 due to emissions from road traffic).

Recent measurements indicate concentrations in the four villages may be near the threshold of 40 $\mu g/m^3$, above which an AQMA would have to be created. Farnham and Little Glemham, on the A12 have been subject to air quality monitoring by both AMEC and SCDC. Further monitoring has been undertaken by SCDC at Stratford St Andrew. SCDC air quality monitoring is to continue at Farnham as the nitrogen dioxide concentration as a periodic mean is elevated at 35 $\mu g/m^3$ and close to the national objective. The AMEC monitoring programme obtained a periodic mean concentration of 33 $\mu g/m^3$ in close proximity to the SCDC tubes.

Nitrogen dioxide concentrations at Stratford St Andrew have been monitored by SCDC, using a single diffusion tube, and indicative tool to identify where there could be a potential air quality issue. In this case the concentration measured at the façade of the nearest receptor to the road side was in the region of 46 $\mu g/m^3$, which exceeds the national objectives. The concentration is a calculated periodic mean (9 months) and does not represent a full year of monitoring. As a consequence, AMEC have agreed to carry out supplementary monitoring at this location and SCDC will also increase its monitoring programme.

3. Forecast Conditions – Without Bypass

Introduction

This section sets out the scenario using forecast baseline traffic levels with development traffic and assuming no bypass.

Traffic

WSP modelled 2021 on behalf of EDFE as a proxy for the busiest construction year for Sizewell 'C' in terms of workers on site. However, assuming a 2017 start date for construction and assuming peak construction 6 – 7 years later, peak traffic levels would be reached by about 2024. Traffic growth has therefore been calculated for 2024.

As we have obtained and assessed 2012 ATC data, we have reviewed TEMPRO and National Transport Model (NTM) forecast data and have forecast growth from 2012 to 2024 as shown in **Table 2**. These equate to an overall background growth of 1.4% per annum to 2024.

Table 2: 2012 to 2024 Growth

Vehicle Type	Growth 2012 - 2024
Car	17.1%
LGV	39.7%
HGV	21.9%

Sizewell 'C' assumed daily traffic generated during construction has been based on currently limited available information, with a peak traffic level of 1,795 as shown in **Table 3**. There is uncertainty regarding the development traffic volumes and this figure could be a significant underestimate of daily demand.

Table 3: Sizewell C development traffic assumptions

Vehicle Type	Peak Levels
Workers	*5,600*
Cars	400
Buses	200
LGV	430
HGV	765
Total Traffic	**1,795**

Applying the background growth factors and development traffic assumptions results in the forecast AADT flows of 20,210 in 2024. This is equivalent to a growth rate of 2.2% per annum, but in practice there would be high levels of development traffic before the peak construction period, sustained over a number of years. Based on the limited information available and current assumptions, this is likely to be the period 2017 – 2024.

For economic assessment purposes traffic flow has been divided into a number of flow groups. These have been extracted from the A12 ATC site but exclude the period between 2400-0600 as hourly data were not available and this period only accounted for around 2% of total annual traffic.

Table 4 provides a breakdown by vehicles per hour in both directions on the A12. It can be seen that there are a significant number of hours where the volume in 2012 was between 400 and 600 vph. Using the growth calculated from 2012 and applying that to the 2012 flow ranges it is possible to calculate the equivalent flow ranges in 2024 (the

last year assumed with Sizewell 'C' construction traffic). It has been assumed that the growth will apply evenly across all hours in the year with the result that the number of hours in the higher flow groups increases over time. For example the 800 vph and above groups increase from 3% in 2012 to 17% in 2024.

Of the 1,800 forecast Sizewell 'C' daily trips it has been assumed that these are spread evenly throughout the working day between 0700 and 2200, although it could be argued that Sizewell traffic will be concentrated in certain hours.

Table 4: A12 Two-way flow ranges 2012 and 2024 (0600-2400)

Flow Range vph	Hours per Year 2012	Proportion 2012	Hours per Year 2024	Proportion 2024
<400	5374	40.8%	4716	35.8%
400-500	1988	15.1%	655	5.0%
500-600	2854	21.7%	1143	8.7%
600-700	1719	13.0%	2418	18.4%
700-800	813	6.2%	2011	15.3%
800-900	251	1.9%	1231	9.3%
900-1000	112	0.9%	610	4.6%
1000-1100	43	0.3%	202	1.5%
1100-1200	18	0.1%	111	0.8%
>1200	4	0.0%	79	0.6%

Journey Times

Using the above assumptions and the speed flow relationship it is possible to calculate an average vehicle speed for each of the flow ranges as shown in **Table 5**. Taking a mid-point of the volume range the average speed and travel time along the 6.9km section of the A12 through the Four Villages has been calculated for the given level of traffic volume. From **Table 4** and **Table 5** it can be determined that the proportion of traffic taking over seven minutes to travel through the Four Villages will increase from 22% to over 50%.

Table 5: Calculated Traffic Speeds and Travel Times for a Given Level of Traffic Flow by Direction

Flow (vph) (Mid Point of Flow Range)	Speed (kph)	Travel Time (mins) Over 6.9km
150	66.2	6.23
250	64.7	6.40
350	63.2	6.55
450	61.8	6.70
550	60.3	6.86
650	58.9	7.03
750	57.4	7.21
850	55.9	7.40
950	50.9	8.13
1050	45.9	9.01

Accidents

Assuming standard COBA rates and assumptions, the total number of accidents will increase based on the preceding assumptions on growth in traffic.

Air Quality

As noted earlier, NO_2 levels are near or potentially above the national objectives. The increase in number of HGVs is also likely to result in an increase in particulate matter. An increase in traffic, all else being equal, will result in an increase in emissions and a decrease in air quality.

An AQMA may have to be declared and measures introduced to improve air quality. This might include restrictions on certain vehicle types at certain times of the day.

It is also worth noting within this context that assessment will need to be made of the noise impacts of development traffic, given the high proportion of HGVs and the location of sensitive receptors. Earlier consultation exercises have identified HGVs as the main cause of noise, vibration and fumes. There is likely to be strong local opposition to an increase in traffic that persists for several years as a result of developments in the area.

4. Forecast Conditions – With Bypass

The preceding section identified the impact of traffic forecasts on the A12 assuming no interventions to address the impacts associated with the development traffic. This section sets out forecast conditions assuming a single or dual carriageway bypass is built.

Traffic

Traffic levels have been assumed to be the same with a bypass as without a bypass. However, the increase in traffic and congestion along the A12 as a result of the development traffic may result in suppressed demand that will be released with a bypass.

Journey Times

With a new bypass and using COBA speed flow relationships and assumptions on the relevant parameters that affect the speed flow curve (see **Figure 4**), travel times have been calculated over the length of the new bypass.

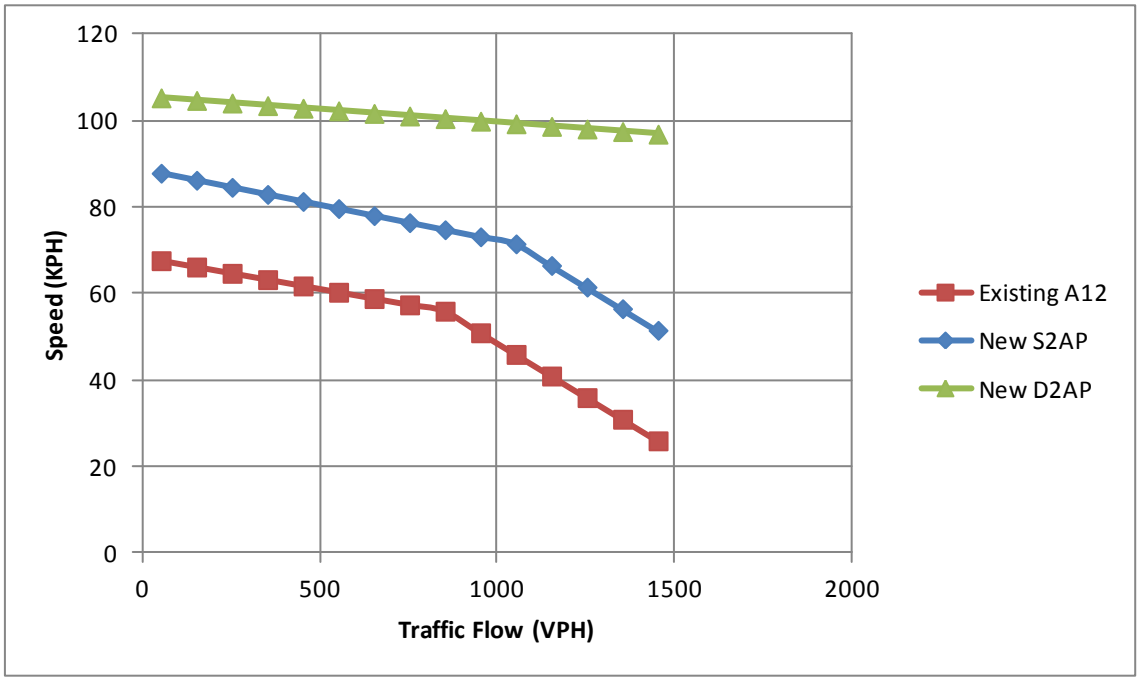

Figure 4: Speed-flow curve for existing A12 and new single (S2AP) and dual (D2AP) carriageway bypass

Table 6 indicates the travel time savings compared to the existing route for a given level of traffic flow. For light vehicles time savings are between about 1.3 and 4.7 minutes, and for HGVs between 0.8 and 4.7 minutes depending on traffic flow on a single carriageway route. For a dual carriageway route travel time savings increase up to about 7.2 minutes for light vehicles and 6.4 minutes for heavy vehicles. In the case of a dual carriageway, the issue of congestion and traffic build-up behind slower moving HGVs brought about the Sizewell C development is significantly negated as light vehicles are able to overtake safely.

Table 6: Time Savings over existing A12 Four Villages route with a bypass

	Time Saving (mins) single carriageway		Time Saving (mins) dual carriageway	
Vehicles per hour	Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
50	1.3	0.8	2.1	1.0
150	1.4	0.9	2.2	1.2
250	1.4	1.0	2.4	1.3
350	1.5	1.1	2.5	1.5
450	1.5	1.2	2.6	1.6
550	1.6	1.3	2.8	1.8
650	1.7	1.5	2.9	1.9
750	1.7	1.6	3.1	2.1
850	1.8	1.8	3.2	2.3
950	2.4	2.4	3.9	3.0
1050	3.1	3.1	4.8	3.9
1150	3.8	3.8	5.9	5.0
1250	4.7	4.7	7.2	6.4

Accidents

Using standard COBA rates there is likely to be an improvement in the accident rate, as shown in **Table 7**.

Table 7: Accident rate per million vehicle miles by road type (COBA)

	Road Type		
	Older Single Two Lane Carriageway A Road	Modern Single Two Lane Carriageway with Hardstrip	Modern Two Lane Dual Carriageway with Hardstrip
Link and Junction	0.381	0.232	0.131

Air Quality

As noted earlier, NO_2 levels are near or potentially above the national objectives along the A12 through the four villages, where there are sensitive receptors, given the A12 goes through a built up area. A bypass would have moderate beneficial impacts on local air quality due to the new route diverting the bulk of traffic away from sensitive receptors.

Estimated Costs

The estimated cost of a dual carriageway bypass is about £70-105m and a single carriageway bypass about £39-45m, based on the 2006 Study and some initial work to review and update these costs. Cost estimates will need to be revisited and revised as part of any new assessment.

5. Assessment and Comparison

This section updates the Appraisal Summary Tables from the 2006 Study.

5.1 Dual carriageway bypass

Table 8: Environment dual carriageway bypass

Sub-objective	Qualitative Impacts	Assessment	Update
Noise	Noise levels are likely to be reduced at most residential properties through the 'four villages' as a result of this option. However, noise levels will be increased at some residential properties near to the proposed realignment	Moderate beneficial	
Local Air Quality	Improved local air quality due to new route away from sensitive receptors.	Moderate beneficial	
Greenhouse Gases	Although route is more direct, increased speeds would lead to an increase in CO_2 emissions.	Minor adverse	
Landscape	Substantially damaging to tranquillity and character of river valleys. At odds with pattern and scale of landscape and landform. Cannot be adequately mitigated. Adverse impact on views.	Large adverse	Mitigation or replacement to downgrade the impacts will need study and costing
Heritage of Historic Resources	Particular impact at southern end on Roman small town east of Fiveways and also two BA ring ditches. Survey of rest in 1995 indicates no major archaeological sites but route would require extensive evaluation and has wet deposits in valley bottom areas. Potential high cost.	Large adverse	Mitigation or replacement to downgrade the impacts will need study and costing
Biodiversity	Affects nationally and regionally important species and habitats	Large adverse	Mitigation or replacement to downgrade the impacts will need study and costing.
Water Environment	Route crosses two river floodplains and runs alongside a third area	Moderate Adverse	

Table 9: Safety and economy dual carriageway bypass

Sub-objective	Qualitative Impacts	Quantitative Impacts	Assessment	Update
Accidents	Full dual carriageway bypass scheme will be slightly shorter, have fewer junctions, and replace the A1094 'T' junction with a roundabout	Injury accidents should reduce from 15.0 to 5.5 per year with a NPB of £20.5 M	Large beneficial	
Security				
Transport Economic Efficiency	Benefits from travel time savings between existing route and new 70mph route accumulate to £165.7M. Costs accumulate to a NPC of £38.5M	NPV £147.7M BCR 4.8	Large beneficial	
Reliability	Reduced chance of occasional delays		Slight beneficial	Now essential to enable Sizewell C without negative impact on existing business, including tourism
Wider	Provides a clear continuation		Slight	Now essential to

Sub-objective	Qualitative Impacts	Quantitative Impacts	Assessment	Update
Economic Impacts	of the dual carriageway standard past the poorest standard section of the route to Lowestoft		beneficial	enable Sizewell C

Table 10: Accessibility and integration dual carriageway bypass

Sub-objective	Qualitative Impacts	Assessment	Update
Option values			
Severance	Marked reduction in within village severance	Moderate beneficial	
Access to the Transport System	No change	Neutral	
Transport Interchange	No change	Neutral	Suffolk County Council expectations, but outside current funding expectations. Bypass supports SCC's draft Economic Growth Strategy (January 2013).
Land Use Policy	Full dual carriageway consistent with East of England Plan expectations, but outside current funding expectations.	Neutral	Now essential for Sizewell C. Now essential for Sizewell C. Supports SCC's draft Economic Growth Strategy (January 2013). The key strategic improvement identified for early delivery is a Four Villages Bypass which will be necessary to accommodate construction traffic for Sizewell C. It will also reduce journey times to Lowestoft and help resolve difficulties in the villages, in particular those involving HGVs.
Other Government Policies	No effect	Neutral	Now essential for Sizewell C

5.2 Single carriageway bypass

Table 11: Environment single carriageway bypass

Sub-objective	Qualitative Impacts	Assessment	
Noise	Noise levels are likely to be reduced at most residential properties through the 'four villages' as a result of this option. However, noise levels will be increased at some residential properties near to the proposed realignment	Moderate beneficial	
Local Air Quality	Improved local air quality due to new route away from sensitive receptors.	Moderate beneficial	
Greenhouse Gases	Although route is more direct, increased speeds would balance out this improvement.	Minor adverse	
Landscape	Some impact on views from Farnham and Marlesford, at odds with landform and pattern of landscape in places, adverse impact on tranquillity and ESA without additional mitigation	Moderate adverse	Mitigation or replacement to downgrade the impacts will need study and costing
Heritage of Historic Resources	As for dual bypass but more limited affect on Roman small town at southern end.	Large adverse	Mitigation or replacement to downgrade the impacts will need study and costing
Biodiversity	Affects nationally and regionally important	Large adverse	Mitigation or

Sub-objective	Qualitative Impacts	Assessment	
	species and habitats		replacement to downgrade the impacts will need study and costing.
Water Environment	Route crosses two river floodplains	Moderate Adverse	

Table 12: Safety and economy single carriageway bypass

Sub-objective	Qualitative Impacts	Quantitative Impacts	Assessment	Update
Accidents	Full single carriageway bypass scheme will be slightly more direct, have fewer junctions, and replace the A1094 'T' junction with a roundabout	Accidents should reduce from 15.0 to 9.8 per year with a NPV of £11.2M	Moderate beneficial	
Security				
Transport Economic Efficiency		NPV of £131.1M BCR 6.5	Large beneficial	
Reliability	Reduced chance of occasional delays		Slight beneficial	Now essential to enable Sizewell C without negative impact on existing business, including tourism
Wider Economic Impacts	Would improve the perceived image of the route		Slight beneficial	Now essential for Sizewell C

Table 13: Accessibility and integration single carriageway bypass

Sub-objective	Qualitative Impacts	Assessment	Update
Option values			
Severance	Marked reduction in within village severance	Moderate beneficial	
Access to the Transport System	No change	Neutral	
Transport Interchange	No change	Neutral	
Land Use Policy	Full single carriageway will support the East of England Plan expectations	Slight beneficial	Now essential for Sizewell C. Supports SCC's draft Economic Growth Strategy (January 2013). The key strategic improvement identified for early delivery is a Four Villages Bypass which will be necessary to accommodate construction traffic for Sizewell C. It will also reduce journey times to Lowestoft and help resolve difficulties in the villages, in particular those involving HGVs.
Other Government Policies	No effect	Neutral	Now essential for Sizewell C.

6. Conclusions

The review of current traffic conditions has shown that the priority for interventions to the A12 through the four villages is likely to have slightly reduced in comparison to the findings from earlier studies, as traffic growth of the magnitude forecast has not been realised. However, the additional traffic generated by the Sizewell C development in addition to forecast background growth will be sufficient to require an intervention to address the increase in traffic and the higher proportion of HGVs. This could take the form of either a dual or single carriageway bypass. The assumed development traffic levels might be a significant underestimate of daily demand. The impacts of development traffic on the A12 are likely to raise serious concerns amongst stakeholders, particularly given perceptions over the weakness of the north east Suffolk economy.

The proportion of vehicles in the 800 vph and above groups will increase from 3% in 2012 to 17% in 2024. The proportion of vehicles taking over 7 minutes to complete the journey through the Four Villages will more than double to over half of all traffic. The high levels of development traffic will result in increased journey times, a higher accident rate and poorer air quality. As current NO_2 levels are near national limits, an Air Quality Management Area may have to be declared. Traffic levels are significantly higher during the summer when the proportion of drivers (development traffic and tourists) unfamiliar with the current road layout and accident black spots is likely to increase. A significant proportion of the Suffolk economy is dependent on tourism (directly and indirectly employing 36,000 people) and first time or occasional visitors (there are 6.5 million overnight domestic holiday and overseas visitor nights and 24.7 million daytrip visits).

For nearly 20 years the need for the bypass, and its value for money, have not been in doubt – the problem has been prioritisation for funding. The impact of the Sizewell C traffic requires mitigation through the four villages, and the full bypass provides a clear solution, already examined in outline. Such a bypass can be defined as ‘associated development’ under the guidance on the Planning Act 2008, and included for consideration in the Development Consent Order Application. The bypass would need to be constructed and ready before any major development work commenced on Sizewell C. Mitigation or replacement to downgrade the environmental impacts will need study and costing and this should commence as soon as possible given the current timescale for Sizewell C development.

The Sizewell C traffic will only be present for the first seven or so years of a full bypass life (apart from activity during regular maintenance outages). It will, however have a disproportionate impact on the whole life value for money of the project: the impact is at the beginning of the project life; the increment of flow will result in a disproportionate increase in peak delays and congestion; and the increment of traffic will disproportionately comprise medium and heavy goods traffic unfamiliar with the route and its hazards. The impacts on journey times, congestion, air quality and noise are likely to result in significant local opposition, whilst previous consultation exercises have shown generally favourable stakeholder attitudes toward a bypass, which would negate most of these issues. The funding requirements and prioritisation of other schemes nationally have in the past been the major stumbling blocks to construction of a bypass, but the significant level of development traffic associated with Sizewell C will be sufficient to ensure that progress can be made in a timely manner through the DCO process. A full bypass should therefore be included within the Development Consent Order Application.