

SEAS representation on Roads/Traffic and Tourism

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1 Introduction

- Requested by SEAS to do some mathematical modelling on the effects of building the East Anglia Power Hub just north of Friston.
- Resident in Cambridgeshire, so no declaration of interest, although I know some people in the area.
- There is a need for an electricity collection and distribution site in East Suffolk, and the problem before us is where to locate it. The number of jobs created in East Suffolk is *independent* of the location.
- The A1094 is overwhelmingly the entry to, and exit from Aldeburgh and Thorpeness.
- A feature of the East Suffolk coast is that there is no coastal road, as for example on the North Norfolk coast, and in almost all locations one has to travel inland to the A12 and then coastward even if the locations are one mile from each other as the crow flies, but separated by a river. The map in Figure 1 on the following page shows access to Aldeburgh, primarily along the A1094; the map in Figure 2 on the next page shows the many access roads around Sheringham, North Norfolk, where a recent onshore distribution centre for an offshore wind farm was built.

2 Traffic on the A1094

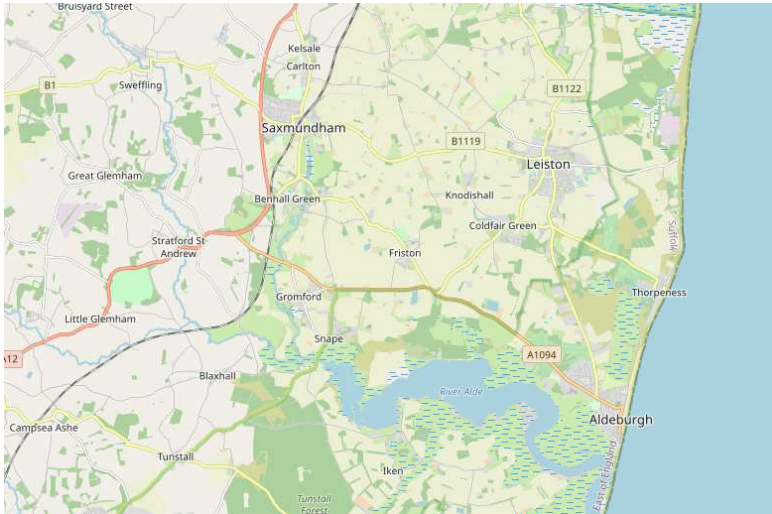
Some modelling of the current traffic density and an estimate of the additional traffic generated by the construction of the East Anglia Hub at Friston.

2.1 Data on present usage of vehicles on the A1094

I have been sent data recorded by the Speed Indicator Device (SID) at Green Heyes (on the A1094 between Friday Street and Snape Church) from Monday 31 August to Sunday 1 November 2020; the numbers recorded are for incoming traffic, i.e. going eastwards. I have chosen this location, as it is more indicative of the traffic coming from the A12 along the A1094; the other measuring points at Snape church and in the main road in Snape, the B1069, show similar data. The SID measures the passing of all vehicles, be they cars, vans, HGVs or tractors.

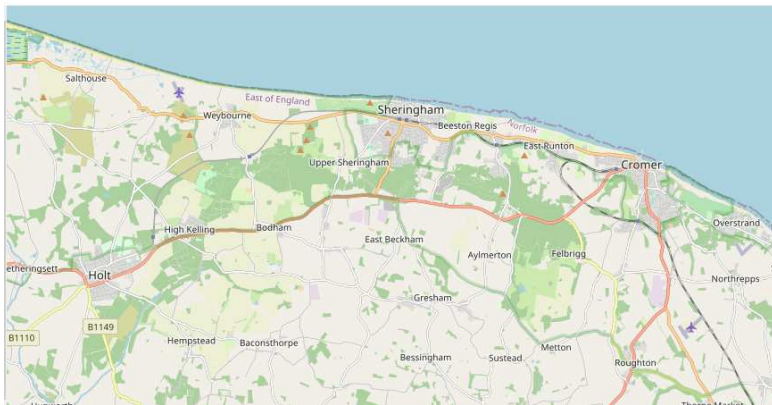
Note that these data are during the pandemic year, so may not be representative of normal years. However, the period observed is when there was a brief return to near-normality.

First, to illustrate the variability of traffic density from week to week, I have taken Sundays in September and Wednesdays in October as a representation. In all these traffic data graphs, the



The A1094 is the primary route into Aldeburgh whether one is travelling from north or south along the A12 (checked by satnav timings, the cross-country route northwards through Leiston is marginally slower than using the A1094, but this may depend on traffic conditions).

Figure 1: Access to Aldeburgh



There are two parallel coastal roads, A148 and A149, with many minor roads leading from one to the other – no shortage of access.

Figure 2: Access to Sheringham

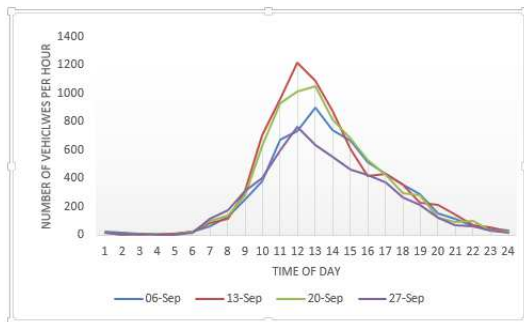


Figure 3: Traffic on September Sundays

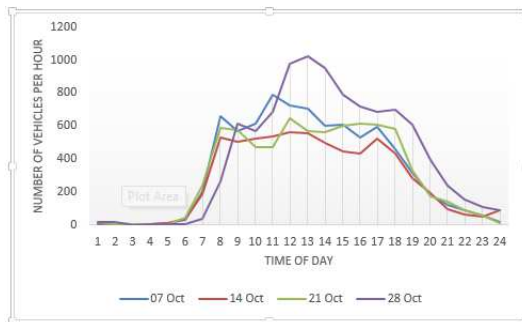


Figure 4: Traffic on October Wednesdays

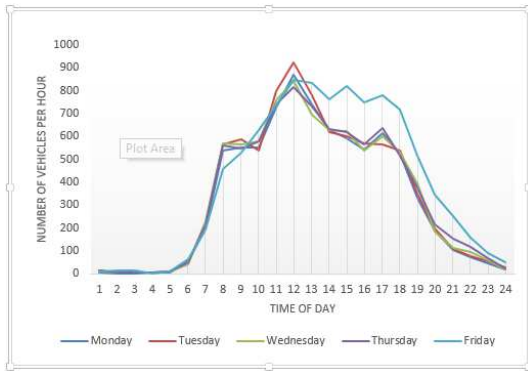


Figure 5: Average weekday traffic at Snape during September 2020

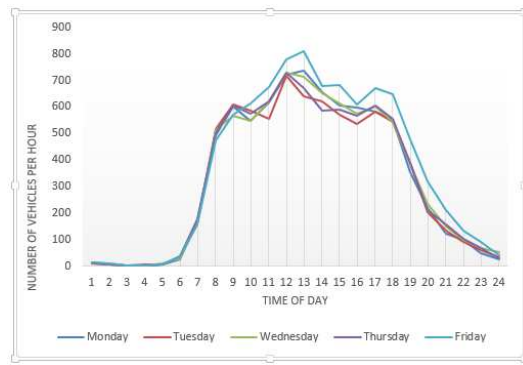


Figure 6: Average weekday traffic at Snape during October 2020

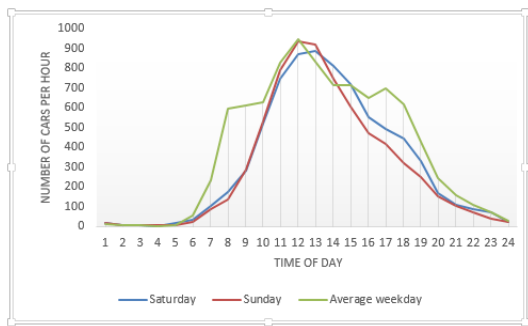


Figure 7: Average weekend traffic at Snape during September 2020 compared to the average weekday

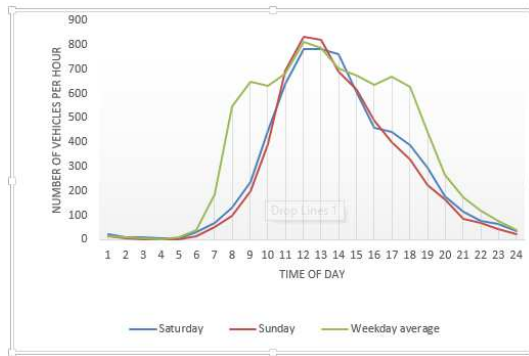


Figure 8: Average weekend traffic at Snape during October 2020 compared to the average weekday

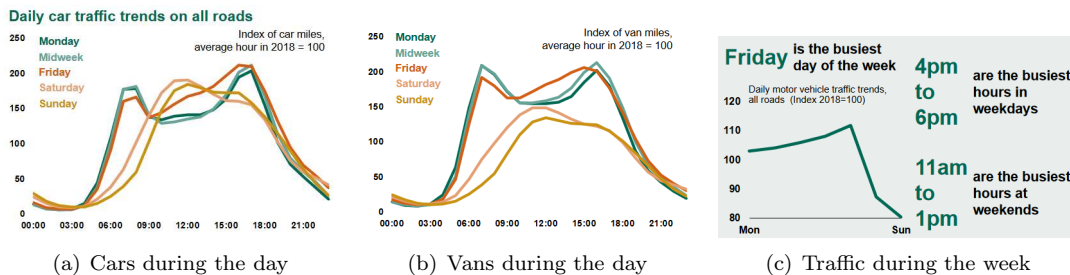
values along the horizontal axis represent the end of the time period; e.g. for the point '11' the number of vehicles per hour is that recorded from ten to eleven o'clock in the morning.

Second, to illustrate variations during weekdays, Figures 5 and 6 show the daily traffic density for the weekdays averaged over the whole month.

Third, Figures 7 and 8 illustrate the daily traffic flow on Saturdays, Sundays and compare this to an average weekday for the months of September and October.

The daily traffic density values are confirmed by the Government website:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/808555/road-traffic-estimates-in-great-britain-2018.pdf from which I have taken the graphs in Figure 9.



(a) Cars during the day

(b) Vans during the day

(c) Traffic during the week

Figure 9: Road traffic estimates from Government web-site

Statistics about temporal variation in traffic flow are compiled using data from DfT's network of automatic traffic counters (ATCs). ATCs count and classify vehicles passing over them 24 hours a day, on every day of the year, so are well suited to provide data on flow variation across a range of timescales.

There is a spread of values from one week to the next, but there are some general and significant observations to be made from the data:

1. Figures 3 on page 2 and 4 on page 2 show that there is considerable variability for the same days in the week over a period of a month; this may be due to good weather, or the staging of a popular event in Aldeburgh;
2. the averages for a day when taken over a month are remarkably similar to each other (see Figures 5 on the previous page and 6 on the preceding page);
3. for most weeks the traffic density on Friday afternoon (see Figures 5 on the previous page and 6 on the preceding page) is marginally the highest, which is the same for England as a whole (see Figure 9(c) on the previous page);
4. there is a marginal increase in traffic density corresponding to the conventional rush hours as shown in the UK data in Figure 9(a) on the preceding page and 9(b) on the previous page (the traffic due to HGVs is even more marked to drop off during the weekend than for vans), but
5. throughout the week there is a peak in the late morning, not during the conventional rush hours;
6. Saturday and Sunday traffic is about the same as traffic on weekdays, apart from the morning and afternoon rush hours; this is different to the norm for England as a whole as seen in Figure 9(c) on the preceding page;
7. the highest hourly rate recorded during this period is 1,222 vehicles per hour;
8. the highest recorded speed was 95 mph, in a 30 mph speed limit area; the average speed was 32 mph (not relevant to the argument, but an interesting fact);
9. the average traffic density on a weekday is 600 vehicles per hour from eight in the morning to eight o'clock at night.

Note the non-zero origin on the graph in Figure 9(c)

Conclusions from the data are:

1. At peak periods the traffic is very heavy — 1200 vehicles per hour is equivalent to one vehicle every 3 seconds, and at 30 mph, there will be a distance of approximately 40 m between vehicles; this is not nose to tail, but almost, and rarely giving an opportunity to do a right-hand turn from a side road onto the main road;
2. there is confirmation that this road is used for leisure — the distribution of traffic density peaks around late morning, not two peaks (for the two rush-hours which is the norm for the country); there is evidence that there are morning and afternoon rush hours on weekdays, but this is swamped by the leisure traffic;
3. the traffic density fluctuations from day to day and week to week indicate casual, not routine, travel for leisure.

The 2-second rule has been devised to maintain a safety margin for peak flow traffic, and the peak flow measured in these data is not so far off.

2.2 Construction Vehicle Movement Modelling assumptions

1. Estimate of 300 HGVs a day leaving and entering the construction site,
2. over a period of 12 hours;

3. besides the HGVs, there will also be other vehicles (cars and goods vehicles) travelling to the site, but there is no assessment of how many there will be;
4. not considering the transport of four (or six if scaled up from data on Blackhillock site, let alone the requirements for all the other enhancements such as Nautilus, Eurolink, Galloper, etc.) 254 ton transformers on 50-metre-long transporters that will require road closure to strengthen bridges and roads, rounding of bends to accommodate the length of the convoy, besides the actual transportation at 5 mph (there are very good videos on YouTube of the transport of these transformers — just search for ‘245t transformer’ or see a specific one on https://www.youtube.com/watch?v=GjPWZH_-FYg).

Conclusions from this data:

1. one HGV every 2.4 minutes, in one direction, and the same returning having unloaded;
2. the extra HGV construction traffic is about one-tenth of the average traffic density;
3. there is no estimate of the construction traffic generated by smaller vans and cars; is there an assumption that the Park and Ride sites will provide parking for all the workers, and that they will be bussed to the construction site from these Park and Ride sites each day? there is mention of a caravan park for workers — where will it be located? this needs to be explored, since this traffic may well be more than the road can bear;
4. no modelling of the traffic slowing down behind HGVs turning left onto the Friston Road from the A1094, nor at the right turn from the A12 onto the A1094;
5. travelling from Snape to Aldeburgh, requiring access from the B1069 onto the A1094 at the junction by Snape church, will be even more problematic.

The additional construction traffic will affect travel times along the A1094, and become a deterrence to tourists; given that the average stay is of 3 nights, comprising both weekend and weeklong stays, any detriment to travel will deter some visitors, for which there is evidence in the next section.

3 Employment in Aldeburgh, Leiston, Thorpeness and smaller habitations

There is very little industry in the area served by the A1094; most of the employment is services and tourism; based on both anecdotal evidence and the lack of rush-hour traffic.

3.1 Effect on Tourism Modelling Assumptions

Sources are:

- [I] Tourism: jobs and growth, a report from Deloitte, November 2013;
https://www.visitbritain.org/sites/default/files/vb-corporate/Documents-Library/documents/Tourism_Jobs_and_Growth_2013.pdf
- [II] UK Tourism Statistics 2019:
https://www.tourismalliance.com/downloads/TA_408_435.pdf
- [III] The Energy Coast:
<https://www.thesuffolkcoast.co.uk/shares/The-Energy-Coast-BVA-BDRC-Final-Report-2019.pdf>;
- [IV] <https://themovemarket.com/area/employmentclassification/leiston-suffolk-coastal/suffolk-coastal-004c,...-004d,...-004e>

Some data from these sources (with references to the above numbered sources in brackets); where different sources have given different values, I have taken the one with lesser impact :

1. every £54,000 spent by tourists generates a job, and the converse should hold as well ([I] page 3);
2. the multiplier effect of employees generating more employment due to their spending locally, with a value of about 2, so every job generated (or lost) in tourism engenders (or curtails) another job ([I] page 28);
3. average spend per residential visitor from the UK is £257 in a seaside or coastal location ([II] page 5);
4. the average length of stay is 3.1 nights ([II] page 5); since this is both for week-long (seven days) and weekend (two days) stays, the conclusion is that most stays are for weekends;
5. tourism businesses have 39% of their staff aged under 30, compared to an average of 21% for other businesses; with many older people in the area, this provides a better age spread in the district and employment for younger people ([II] page 7);
6. the average spend per day visitor is £22 ([II] page 5);
7. the Suffolk Coast has a lot of repeat visitors who come regularly ([III] page 15);
8. based on a survey of visitors, it is estimated that the potential net annual loss during the construction phase is £24,000,000 for the whole of the Suffolk Coast, approximately a reduction by 15% ([III] page 39);
9. estimated (conservatively) that the potential net annual loss after the construction phase is about £20,000,000 ([III] page 41);
10. employment in Leiston, for example, is quite buoyant, with less unemployment than the East of England as a whole ([IV] averaging out all three areas in Leiston).

3.2 Conclusions from the data

The figures above are for the whole Suffolk Coast; a reasonable assumption would be that the major impact, at least half, would be on the stretch of coast between Aldeburgh to Sizewell for which the total loss of income from tourism over the 15 years of construction is about £360,000,000. This sum is not insignificant compared to the cost of the whole project, and it is highly significant for the area with threat of any temporary loss being a permanent legacy.

The estimate is over 440 job losses (12,000,000/54,000 with a multiplier of 2) in Aldeburgh, Leiston and Thorpeness area during the construction phase; it could be followed by a possible resurgence of employment by 70 after all the construction has finished.

Although employment in the Aldeburgh, Leiston, and Thorpeness area is buoyant, albeit somewhat directly and indirectly (the multiplier effect) dependent on the thriving and successful (but volatile and mercurial) tourist industry, there are indications (from evidence that more benefits are claimed) that unemployment is rising possibly in consequence of the loss of visitors during the 2020 pandemic year. There is also anecdotal evidence that part-time work, which for many households is attractive, is becoming even less part-time; such shortfall will not be recorded in official statistics.

One of the attractions of Aldeburgh is the diversity of shops, activities and refreshment facilities, catering for a range of tastes and purses; it is the variety and diversity, besides the attractiveness of the seafront, that tempts visitors to return. Examples of the diversity that the Aldeburgh region offers includes Festivals (Literary, Food and Drink, Documentary Film, Music, Poetry, Art etc.), ornithologists, ramblers, cyclists, botanists, sailors, golfers, swimmers, joggers, canoeists, fishermen, kite flyers, kite surfers, along with family bucket and spade holiday makers, couples looking for romantic breaks, etc.

How many tourist venues, shops and refreshment venues will survive this Covid year is not clear, but the impending downturn of visitors forecast because of the construction phase may well persuade some outlets to close; if spending outlets close from having fewer visitors during the construction phase, it is unlikely that they will reinstitute themselves later. The town will be less diverse in its offerings to visitors, and so less attractive.

4 Modelling Cost to Residential and Business

There have been some studies on the costs incurred through roadworks or infrastructure construction to established businesses. Here is a selected list, but many others will be found through internet searches:

- [I] <https://www.acs.org.uk/advice/roadworks> gives an example of a village shop losing 10% of its custom and profit through months-long roadworks affecting access to the shop.
- [II] <https://researchbriefings.files.parliament.uk/documents/SN00200/SN00200.pdf> gives a brief summary of possible compensation for construction work, and in summary:
 - No compensation for loss of trade due to road works;
 - the compensation from works undertaken by a utility company is enshrined in the legislation drawn up when each was privatised, and compensation is only payable where the relevant statute authorises it;
 - compensation can be claimed if a new highway affects a property value depreciation.

As far as I can judge there is no compensation for a new infrastructure project such as this.

- [III] file:///C:/Users/JOHN~1. TRA/AppData/Local/Temp/The_Effect_of_Road_Traffic_on_Residential_Property.pdf is a study on the effect of Road Traffic on Residential Property Values that argues that noise increase is a good marker for determining compensation for new road traffic.
- [IV] <https://www.sciencedirect.com/science/article/pii/S1877050917309584> is an interesting article in which the authors discuss the financial implications of Accelerated Bridge Construction compared to conventional bridge construction. They produce a model that quantifies the financial penalty per day for delays due to construction; their conclusion is that a more expensive bridge that reduces the construction phase is overwhelmingly more economic for the whole area than a cheaper, conventional bridge. The interesting part is that they model the economics of delay to traffic flow, and other considerations.

Losses due to construction can be quantified, and incorporated in any proposal for an infrastructure project.

5 Other qualitative observations

- Having watched the YouTube video of a 245t transformer travelling through France on its convoy of length 50 m, I am surprised that it is conceived possible to transport these transformers to north of Friston without altering the roundabouts on the A12, around Woodbridge in particular, and the right turn from the A12 to the A1094, and from the A1094 to the country lane to Friston; has an evaluation of the transportation been considered in detail?
- It is ironic that the construction of a green energy site is so dependent on very many HGVs travelling across the countryside, and wonder whether the cost of such transport has been factored in. Using a site nearer the source of the materials would be more efficient, less disruptive and less expensive.

- Similarly, the site at Friston necessitates the creation of two Park and Ride sites, and their eventual dissolution; hardly an energy efficient operation, and an extra cost.
- Not only will the A1094 be laden with goods vehicles, but also the A12.
- One can't help but notice the existence of a freight line from Saxmundham to Leiston, and thence onto Sizewell.

6 Conclusions

1. Every community in East Suffolk will be saying why the East Anglia Hub should not be in its vicinity, but a site has to be chosen that minimises the disruption to the community over its construction phase and is not too costly.
2. My experience as a District Councillor on the Planning Committee is that planning decisions are based on the evidence in front of the committee, and that the committee is not able to decide between various alternatives or make suggestions; this may be different for an ISH, and it may have powers to give partial planning permission, accepting the offshore construction, but asking for a re-assessment of the onshore location (or vice-versa).
3. The A1094 road is the primary artery to communities whose main income is from casual, but intense, tourism that is the mainstay of the local economy, as well as used by farm traffic with farms along its entire length from the A12 to Aldeburgh;
4. The A1094 is near to capacity for some periods of the day, and that the addition of slow-accelerating HGVs will impact on the traffic, leading to avoidance of the road by casual and volatile users.
5. Over the construction period it is estimated that job losses in Aldeburgh, Leiston and Thorpeness will be of the region of 440, and that this particular region will lose more than £180,000,000. Other locations in East Suffolk may lead to a loss of jobs and business, but not to the extent that will be incurred by the region served by the A1094 since it is the main access route to a primary tourist destination.
6. Section 4 on the previous page refers to studies on losses sustained from infrastructure projects. This loss should be factored in when deciding the location of the site, together with the extra cost of so many HGVs bringing materials far from their source, the cost of construction (and subsequent demolition) of the Park and Ride sites, the changes to the road layout to accommodate the transport of the massive transformers, the extra traffic from employees' cars and smaller delivery vehicles.
7. When comparison is made to a previous and seemingly similar construction project, the similarity and differences must be evaluated objectively, and with reference to the actual features in the two projects, not the final infrastructure.