

2017

Traffic study into proposed developments in vicinity of Pagham



2020 Consultancy

Version 1

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1.0 Introduction

2020 Consultancy have been commissioned by Pagham Parish Council to review the existing road network within the village of Pagham as well as the wider strategic road network southwards from the A27 to assist determine the suitability of a number of planning applications that have been submitted to Arun District Council.

The study area is illustrated in figure 1 below and includes:

- B2145 south of the A27 Chichester by-pass;
- B2166 just west of North Mundham village;
- Pagham Road just north of the junction with Lower Bognor Road;
- Pagham Road between the junctions of Lower Bognor Road and Seftor Road;
- Seftor Road just east of the junction with Hook Lane.

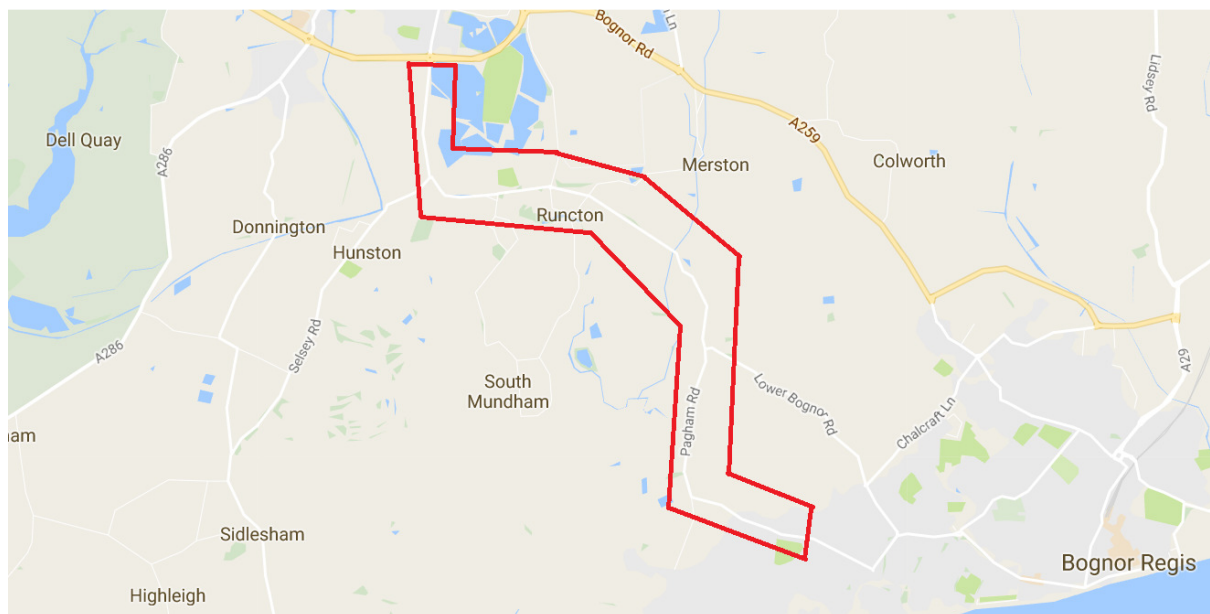


Figure 1

2.0 Background

Pagham is a semi-rural, semi-urban coastal village and civil parish in the Arun district of West Sussex, England, with a population of around 6,100. The village is located approximately 6 miles south of the closet city, Chichester and approximately four miles west of the closest town Bognor Regis. Access to Pagham is difficult with only one significant road that leads directly into the village centre, Pagham Road. To access Pagham from the north, the route takes you from the A27 southwards along the B2145, traveling through the village of North Mundham along the B2166, before entering Pagham Road just north of Lagness. Access onto Pagham Road from the east can be made via Lower Bognor Road, or Seftor Road.

The closet train station to Pagham is Bognor Regis which is approximately 4.5 miles from the centre of Pagham village. There are two bus services that serve the village, the 600 and 660 that both travel between Chichester and Bognor Regis.

As part of the study 2020 Consultancy have considered the following planning applications to determine the likely impact they will have on the road network:

P/6/17/OUT - Outline application with some matters reserved for construction of up to 300No. new homes, Care home of up to 80No. beds, D1uses of up to 4000sqm including a 2 form entry Primary School, formation of new means of access onto Hook Lane & Pagham Road, new pedestrian & cycle links, the laying out of open space, new strategic landscaping, habitat creation, drainage features & associated ground works & infrastructure.

P/134/16/OUT - Outline application with some matters reserved for development of up to 250 dwellings (incl affordable homes), provision of land for a replacement scout hut, land for an Ambulance Community Response Post facility & land for 1FE primary school. Primary vehicular access from Sefter Rd & demolition of 80 Rose Green Road & creation of pedestrian & emergency only access. Provision of public open space incl childrens play areas, landscaping, drainage & earthworks.

P/140/16/OUT - Outline application for access only - mixed use development comprising of up to 400 dwellings, a care home with up to 70 beds, a Local Centre comprising up to 2000sqm of A1/A2/A3/D1/sui generis floorspace, provision of land for a 1FE primary school (with sufficient space to ensure that it is expandable to 2FE), provision of land for a scout hut, safeguarding of land to help link the site to the Pagham Harbour Cycle Route & other community uses including public open space & allotments with some matters reserved.

These three planning applications total a potential 950 additional dwellings, two new care homes with a combined total of 150 beds, three new primary schools, and 6000sqm of land use. However upon a more detailed review there is a potential for an additional 150 dwellings due to only one school being constructed out of the three proposed sites, which would exacerbate the situation further still. This will result in significantly more modal trips on the road network.

As stated by the Office for National Statistics, in England on average there are 2.4 occupants in each household. Therefore if 950 additional dwellings were constructed within the vicinity of Pagham, the population would increase by approximately 2280. This would increase the population of Pagham village by over 37%.

3.0 Automatic Traffic Counts

As part of our involvement working with Pagham Parish Council on the review of these proposed developments, we commissioned Automatic Traffic Counts at five locations on the road network on the approach to Pagham from the north and the east. These five locations were:

- Site 1 – B2145 south of the A27 Chichester by-pass;
- Site 2 – B2166 just west of North Mundham village;
- Site 3 – Pagham Road just north of the junction with Lower Bognor Road;

- Site 4 – Pagham Road between the junctions of Lower Bognor Road and Sefter Road;
- Site 5 – Sefter Road just east of the junction with Hook Lane.

Figures 2 and 3 show the location plans for these Automatic Traffic Counts (ATC). The purpose of the ATC was to identify existing traffic volume and traffic speed to determine the existing capacity of the road network and identify what measures, if any would be required to address the additional 37% of potential traffic entering and exiting the Pagham area.

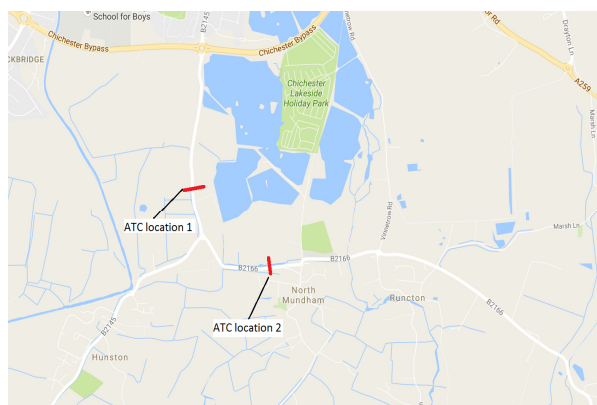


Figure 2

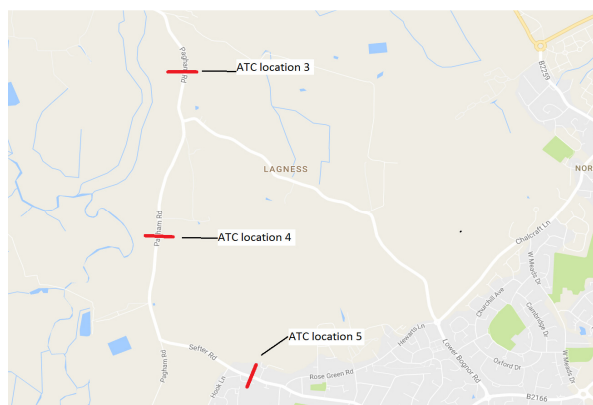


Figure 3

The ATC were in place for a period of seven full days from the 12th January till 19th January 2017. Results from the 12th were not included as a full day wasn't available. It is worth noting that Pagham is subject to higher volumes of traffic during the peak summer months so the results can be classified as lower levels. Following discussions with the Parish Council it is estimated that an additional 100-200 vehicles a day can be travelling to or from Pagham, reducing the road capacity further still. This needs to be considered as part of any planning submission.

Each ATC site recorded both directions of travel for three vehicle classes:

- Cars and light goods vehicles;
- Other goods vehicles / buses;
- Large other goods vehicles.

3.10 Site 1 – B2145 south of the A27 Chichester by-pass

Across the seven days, on average 7201 vehicles travelled north over the ATC and 7046 vehicles travelled south over the ATC. Approximately 94% of these vehicles were either cars, light goods vehicles, or buses. The average number of vehicles travelling over the ATC increases if the seven day average is reduced to a five day average to cover Monday to Friday. The five day average northbound increased to 7961 and the five day average southbound increased to 7818. This means on average 331 vehicles an hour travel northbound and 326 vehicles an hour travel southbound between Monday and Friday.

However during the peak period the highest number of vehicles recorded in one direction over a one hour period was 996. This occurred northbound between 7am and 8am on Wednesday 18th January. This equates to 17 vehicles travelling over the ATC every minute. This figure would be higher if it wasn't for traffic congestion resulting in slower mean speeds. During the same timeframe 33% of the vehicles were travelling between 11-20mph. This section of B2145 has a national speed limit of 60mph. Only 2.5% of vehicles travelling northbound over the ATC between 7am and 8am were travelling over 40mph.

The mean speed during this hour was 24.7mph. If you compare this figure to 11am-129m when the traffic volume is considerably lower the mean speed increases to 36.4mph. Nearly 19% of vehicles travelling northbound over the ATC between 11am-12pm were travelling over 40mph.

The average speed over the ATC across the seven days was 35.1mph northbound and 41.4mph southbound. Taking the average speed during the Monday-Friday morning peak of 7am-8am the average speed was 25.1mph northbound and 39.2mph southbound. This suggests that there is little congestion travelling southbound towards Pagham whereas there is significant congestion travelling northbound towards the A27.

Adding an additional 37% of potential traffic on this road network would result in considerably greater journey times and congestion. This could mean an additional 369 vehicles on the B2145 travelling northbound trying to access the A27. This would result in 23 vehicles a minute or a vehicle less than every three seconds.

Having reviewed the road network around the B2145 it is our opinion that it isn't possible to increase capacity sufficiently to allow this many vehicles to access the road during peak times. We have also analysed the surrounding area including land use to determine possible solutions such as carriageway widening but due to the existing land use such as properties this proposal doesn't seem viable.

One of the major reasons for the existing congestion on the B2145 is due to the congestion experienced on the A27 by-pass during peak periods. This level of traffic creates difficulties for traffic to exit the B2145 safely. Therefore the proposed developments would impact an already over capacitated strategic route.

The location of site one is shown in figure 4 below.



Figure 4

3.11 Recommended Action

To consider the proposed development sites it is recommended that major road improvements would be required. The likely cost will be in excess of £10 million. It would be necessary to consider junction improvements to the following junctions:

- Roundabout junction of B2145 and B2166;
- Roundabout junction of Lagness Road and Vinnetrow Road;
- Junction of Pagham Road and Lower Bognor Road;
- Junction of Pagham Road and Sefter Road.

The B2145 and B2166 routes into and out of Pagham would also need significant investment to allow the additional traffic to not result in a negative impact on the existing road network. This would most likely require carriageway widening. However following an initial investigation this proposal is highly unlikely as significant land ownership would be required. Due to a number of landowners' owners operating business such as farming and crop growing it's envisaged that this land negotiation would be unsuccessful.

It is also worth noting that there are a number of pinch points that would result in substantial congestion bottlenecks occurring, which would significantly reduce the impact of any road improvement scheme implemented.

Therefore there isn't a viable recommended action for the vicinity of site 1 as part of the proposed development sites, which means the total size of the sites should be reduced to a more manageable level.

3.20 Site 2 – B2166 just west of North Mundham village

Across the seven days, on average 5738 vehicles travelled east over the ATC and 6536 vehicles travelled west over the ATC. Approximately 97% of these vehicles were either cars, light goods vehicles, or buses. The average number of vehicles travelling over the ATC increases if the seven day average is reduced to a five day average to

cover Monday to Friday. The five day average eastbound increased to 6536 and the five day average westbound increased to 6915. This means on average 272 vehicles an hour travel eastbound and 288 vehicles an hour travel westbound between Monday and Friday.

However during the peak period the highest number of vehicles recorded in one direction over a one hour period was 952. This occurred westbound between 8am and 9am on Wednesday 18th January. This equates to 16 vehicles travelling over the ATC every minute. This figure would be higher if it wasn't for traffic congestion resulting in slower mean speeds. During the same timeframe 88% of the vehicles were travelling less than 35mph. This section of B2166 has a national speed limit of 60mph. Only 2.1% of vehicles travelling westbound over the ATC between 8am and 9am were travelling over 40mph.

The mean speed during this hour was 24.7mph. If you compare this figure to 11am-12pm when the traffic volume is considerably lower the mean speed increases to 36.4mph. Nearly 19% of vehicles travelling northbound over the ATC between 11am-12pm were travelling over 40mph.

The average speed over the ATC across the seven days was 36.5mph eastbound and 34.6mph westbound. Taking the average speed during the Monday-Friday morning peak of 7am-8am the average speed was 33.7mph eastbound and 28.6mph westbound. This suggests that there is greater congestion travelling westbound towards the B2145 which subsequently leads to the A27.

These results reinforce the assumption that the additional 37% of potential traffic from the proposed developments would impact the wider road network including the B2145 and the A27.

Having reviewed the road network around the B2166 it is our opinion that it isn't possible to increase capacity sufficiently to allow this many vehicles to access the road during peak times. We have also analysed the surrounding area including land use to determine possible solutions such as carriageway widening but due to the existing land use such as properties this proposal doesn't seem viable. It is also considered irrelevant as improving the road network along the B2166 will not benefit the local road network as traffic congestion would still occur on the B2145.

The location of site two is shown in figure 5 below.



Figure 5

3.21 Recommended Action

To consider the proposed development sites it is recommended that major road improvements would be required. The likely cost will be in excess of £10 million. It would be necessary to consider junction improvements to the following junctions:

- Roundabout junction of B2145 and B2166;
- Roundabout junction of Lagness Road and Vinnetrow Road;
- Junction of Pagham Road and Lower Bognor Road;
- Junction of Pagham Road and Sefter Road.

The B2145 and B2166 routes into and out of Pagham would also need significant investment to allow the additional traffic to not result in a negative impact on the existing road network. This would most likely require carriageway widening. However following an initial investigation this proposal is highly unlikely as significant land ownership would be required. Due to a number of landowners' owners operating business such as farming and crop growing it's envisaged that this land negotiation would be unsuccessful.

It is also worth noting that there are a number of pinch points that would result in substantial congestion bottlenecks occurring, which would significantly reduce the impact of any road improvement scheme implemented.

Therefore there isn't a viable recommended action for the vicinity of site 2 as part of the proposed development sites, which means the total size of the sites should be reduced to a more manageable level.

3.30 Site 3 – Pagham Road north of junction with Lower Bognor Road

Across the seven days, on average 6363 vehicles travelled north over the ATC and 6791 vehicles travelled south over the ATC. Approximately 97% of these vehicles were either cars, light goods vehicles, or buses. The average number of vehicles travelling over the ATC increases if the seven day average is reduced to a five day average to

cover Monday to Friday. The five day average northbound increased to 7139 and the five day average southbound increased to 7654. This means on average 297 vehicles an hour travel northbound and 319 vehicles an hour travel southbound between Monday and Friday.

However during the peak period the highest number of vehicles recorded in one direction over a one hour period was 1248. This occurred northbound between 5pm and 6pm on Wednesday 18th January. This equates to 21 vehicles travelling over the ATC every minute. This figure would be higher if it wasn't for traffic congestion resulting in slower mean speeds. During the same timeframe 87% of the vehicles were travelling less than 35mph. This section of Pagham Road has a national speed limit of 60mph. Only 1.8% of vehicles travelling southbound over the ATC between 5pm and 6pm were travelling over 40mph.

The mean speed during this hour was 30.5mph. If you compare this figure to 11am-12pm when the traffic volume is considerably lower the mean speed increases to 41.2mph. Nearly 49% of vehicles travelling southbound over the ATC between 11am-12pm were travelling over 40mph.

The average speed over the ATC across the seven days was 40.7mph northbound and 38.5mph southbound. Taking the average speed during the Monday-Friday morning peak of 7am-8am the average speed was 36.1mph northbound and 37.7mph southbound. However taking the Monday-Friday afternoon peak of 5pm-6pm the average speed was 39.2mph northbound and 32.4mph southbound. This suggests that the majority of traffic in the morning peak is heading north out of Pagham and the majority of traffic in the afternoon peak is heading south into Pagham. Therefore it is a fair assumption that this traffic is residents of Pagham village.

Adding an additional 37% of potential traffic on this road network would result in greater journey times and congestion, especially in the afternoon peak with an average of 1099 vehicles travelling southbound along Pagham Road. This could mean an additional 407 vehicles on Pagham Road travelling southbound. This would result in 25 vehicles a minute or a vehicle less than every three seconds.

Having reviewed the road network around Pagham Road it is our opinion that it isn't possible to increase capacity sufficiently to allow this many vehicles to access the road during peak times. We have also analysed the surrounding area including land use to determine possible solutions such as carriageway widening but this proposal doesn't seem viable. It is also considered irrelevant as improving the road network along Pagham Road will not benefit the local road network as traffic congestion would still occur on the B2166 or the B2145.

The location of site three is shown in figure 6 below.



Figure 6

3.31 Recommended Action

To consider the proposed development sites it is recommended that major road improvements would be required such as road widening along Pagham Road. The likely cost will be in excess of £5 million. However following an initial investigation this proposal is highly unlikely as significant land ownership would be required. Due to a number of landowners' owners operating business such as farming and crop growing it's envisaged that this land negotiation would be unsuccessful.

Therefore there isn't a viable recommended action for the vicinity of site 3 as part of the proposed development sites, which means the total size of the sites should be reduced to a more manageable level.

3.40 Site 4 – Pagham Road between the junctions of Lower Bognor Road and Sefter Road

Across the seven days, on average 3981 vehicles travelled north over the ATC and 3841 vehicles travelled south over the ATC. Approximately 96% of these vehicles were either cars, light goods vehicles, or buses. The average number of vehicles travelling over the ATC increases if the seven day average is reduced to a five day average to cover Monday to Friday. The five day average northbound increased to 4443 and the five day average southbound increased to 4246. This means on average 185 vehicles an hour travel northbound and 177 vehicles an hour travel southbound between Monday and Friday.

However during the peak period the highest number of vehicles recorded in one direction over a one hour period was 786. This occurred northbound between 7am and 8am on Wednesday 18th January. This equates to 13 vehicles travelling over the ATC every minute.

The mean speed between 7am and 8am was 42.2mph. If you compare this figure to 11am-12pm when the traffic volume is lower the mean speed increases to 44.4mph.

This would suggest that traffic volume isn't an issue along this section of Pagham Road and doesn't have a significant impact on drivers speed along the route.

The average speed over the ATC across the seven days was 45.1mph northbound and 45.0mph southbound. Taking the average speed during the Monday-Friday morning peak of 7am-8am the average speed was 42.8mph northbound and 42.9mph southbound. This suggests that although traffic volume isn't a major issue there is a slower average speed during the Monday-Friday morning peak.

Adding an additional 37% of potential traffic on this road network would result in slightly greater journey times and congestion. As this ATC site is within close proximity to a proposed development site this would seem to support the development site. However this isn't the case as the evidence suggests that the wider local road network and strategic road network wouldn't be able to cope with the additional capacity.

Therefore it is crucial that both the wider local road network and strategic are deliberated when considering the proposed development sites. It is possible that developers will carry out local traffic surveys, which may demonstrate the road network can manage the additional traffic. However without considering the wider road network we consider this data to be meaningless as the evidence suggests that vast numbers of residents travel outside of Pagham for work or education etc.

Having reviewed the road network around the B2145 it is our opinion that it isn't possible to increase capacity sufficiently to allow this many vehicles to access the road during peak times. We have also analysed the surrounding area including land use to determine possible solutions such as carriageway widening but due to the existing land use such as properties this proposal doesn't seem viable.

The location of site four is shown in figure 7 below.



Figure 7

3.41 Recommended Action

To consider the proposed development sites it is recommended that road improvements would be required such as junction improvements and road safety initiatives along Pagham Road. The likely cost will be in excess of £1 million. Although there isn't high numbers of reported collisions along Pagham Road, our investigation has discovered high numbers of small collisions and accidents have occurred including vehicles leaving the carriageway and small vehicle impacts that haven't resulted in emergency services being involved.

Therefore the recommendation for the vicinity of site 4 as part of the proposed development sites includes the following:

- **Road safety improvements along Pagham Road;**
- **Junction improvements at the junction of Pagham Road and Lower Bognor Road;**
- **Junction improvements at the junction of Pagham Road and Sefter Road.**

3.50 Site 5 – Sefter Road just east of the junction with Hook Lane

Across the seven days, on average 3279 vehicles travelled east over the ATC and 4010 vehicles travelled west over the ATC. Approximately 98% of these vehicles were either cars, light goods vehicles, or buses. The average number of vehicles travelling over the ATC increases if the seven day average is reduced to a five day average to cover Monday to Friday. The five day average eastbound increased to 3587 and the five day average westbound increased to 4384. This means on average 149 vehicles an hour travel eastbound and 183 vehicles an hour travel westbound between Monday and Friday.

However during the peak period the highest number of vehicles recorded in one direction over a one hour period was 508. This occurred westbound between 7am and 8am on Tuesday 17th January. This equates to 22 vehicles travelling over the ATC every minute.

The mean speed between 7am and 8am was 30.3mph. If you compare this figure to 11am-12pm when the traffic volume is lower the mean speed actually decreases to 28.5mph. This suggests that commuters are likely to travel faster as they have a destination they are endeavouring to get to as quickly as possible. It's a fair assumption that they are travelling faster along this section of road as they expect to encounter congestion further along the route i.e. the B2145 or A27.

The average speed over the ATC across the seven days was 30.2mph eastbound and 29.8mph westbound. Taking the average speed during the Monday-Friday morning peak of 7am-8am the average speed was 30.6mph eastbound and 30.4mph westbound.

Adding an additional 37% of potential traffic on this road network would result in slightly greater journey times and congestion. As this ATC site is within close proximity to a proposed development site this would seem to support the development site. However this isn't the case as the evidence suggests that the wider local road network and strategic road network wouldn't be able to cope with the additional capacity.

The location of site five is shown in figure 8 below.



Figure 8

3.51 Recommended Action

To consider the proposed development sites it is recommended that road improvements would be Sefton Road. The likely cost will be in excess of £500,000. It is noted that proposed traffic calming measures are considered along Sefton Road as part of the proposed development sites. This may assist in reducing traffic speed. This in combination with junction improvements with Pagham Road may be sufficient in dealing with the additional traffic resulting from the development sites.

However it isn't envisaged that the proposals will make the necessary improvements regarding traffic volume. However as the traffic survey data suggests that traffic volume isn't as high in the vicinity of site 5 it may be possible to produce suitable proposals. This will need further investigation before a final decision can be made on the development sites as this cannot be a retrospective action.

Therefore the recommendation for the vicinity of site 5 as part of the proposed development sites includes the following:

- **Road safety improvements such as traffic calming along Pagham Road;**
- **Junction improvements at the junction of Pagham Road and Sefton Road.**

4.0 Summary and Conclusions

To summarise the ATC surveys it is possible to determine that the proposed development sites will have a more substantial impact on the wider local road network and strategic road network compared to the local road network within the vicinity of the proposed sites. Therefore it's crucial the entire road network is considered when determining the outcome of the sites.

It is our opinion that these results are more concerning for the development sites than if the negative impact was only on the local road network and not the wider local road network and strategic road network. This is because there is less traffic to consider and proposals to address the impact will be more straight forward and less costly.

In our opinion there isn't viable options for the wider local road network such as the B2166 and B2145 and strategic road network such as the A27 to support the proposed development sites. Therefore we recommend that the development sites are reconsidered with a view to considerably reducing the number of dwellings or relocating the sites to an area that has greater capacity on the road network.

This recommendation is further supported by the Highways England decision to not progress with the A27 major improvement scheme. This decision means the A27 will be subjected to additional traffic, which will result in further delays on the road network. Having reviewed the planning applications, it's felt that no consideration has been given to the impact to the strategic road network. This is a fundamental oversight as the results of the traffic surveys clearly demonstrate that the majority of residents of Pagham wish to travel north towards the A27 on a daily basis, especially during peak times i.e. 7am-9am.