

Our ref: HORN-009
Your ref: EN010080

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21 November 2018

For the attention of: Mr David Prentis

Dear Sir

Hornsea Project Three Offshore Wind Farm (EN010080): Written Statement

I refer to the previous submission by Highways England in the form of a written statement dated and submitted on the 7 November 2018 regarding the above. This letter provides an update to our Written Statement and also to the Statement of Common Ground (SoCG) between the Applicant and Highways England dated 6 November 2018.

On 2 November 2018, we received a response from the Applicant, entitled 'Applicant's Response to Highways England Briefing Note 01a', dated November 2018, which was acknowledged in the SoCG. A copy of the applicant's response is attached.

This letter should be read in conjunction with the Briefing Notes BN02 and BN03 (both are dated 19 November 2018), prepared by our Spatial Planning Consultant, AECOM, attached with this letter.

As mentioned in our Written Statement and in the SoCG, the following issues are still outstanding:

A47/Taverham Road east of Honingham Junction

- After reviewing the 'Applicant's Response to Highways England Briefing Note 01a', we remain concerned that there is a serious risk to the safe and free flow of traffic on the A47 Trunk Road from the use of the A47 / Taverham Road junction as a means of access to construction sites 17 (B) and 18 (B).
- BN02 attached identifies a number of issues with the layout and geometry of the junction and the potential consequences of up to 66 additional Heavy Goods Vehicles (HGVs) turning into and out of Taverham Road for the duration of the works at those sites.
- BN03 identifies a cluster of Personal Injury Accidents (PIAs) (a total of six in five years) associated with the use of the A47 / Taverham Road junction of which four

involved stationary vehicles waiting to make the right turn into Taverham Road, being hit from behind by vehicles approaching along the A47 from the east.

- BN02 suggests a number of potential mitigation measures and recommendations for alternative access arrangements to promote the safe and free flow of traffic at this junction, which we requested the applicant to consider in consultation with ourselves and with the Local Highway Authority, Norfolk County Council.
- In the absence of any other consideration, Highways England's preferred solution would be that no HGVs accessing or leaving the construction sites should join or leave the A47 at the A47 / Taverham Road junction. However, we recognise that this may not be practicable in relation to its impact on the Local Road Network and therefore request that the Construction Traffic Management Plan for the sites in question should ban HGVs from making any turns into and right turns out of Taverham Road and require them to use Taverham Road in one direction only. This should be supplemented by clearance of foliage within the westbound highway verge and the use of temporary traffic signs to advise drivers using the A47 of the risk of HGVs turning ahead and of the risk of encountering stationary vehicles in the carriageway.

A47/A140 and A47/ A1074 Junctions

- The SoCG between the Applicant and ourselves refers to a sensitivity test to be undertaken in respect of the number of anticipated construction vehicles through these junctions and the time of day this flow will occur in relation to the peak traffic flows using these junctions. This analysis has still to be undertaken and was not included in the Applicant's Response to Highways England Briefing Note 01a.

A140/B1113 Junction

- Highways England remain concerned about the effect of construction traffic on this junction and the risk of a queue of traffic tailing back to and affecting the operation of the A47/ A140 junction. We understand that the applicant is liaising with Norfolk County Council (NCC) in respect of their impact on this junction. However, we have not yet heard from either the Applicant or NCC that the assessment of the A140/ B1113 junction has been accepted as satisfactory.

In light of the above we would recommend the DCO only be confirmed once these issues have been satisfactorily resolved.

Yours faithfully



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Project:	Highways England Spatial Planning Arrangement 2016-2020	Job No:	60506522 / DN055.002
Subject:	Hornsea Project Three Offshore Wind Farm – Impact on the A47/ Taverham Road junction at Honingham		
Prepared by:	Andrew Cuthbert	Date:	16th November 2018
Checked by:	Andrew Beard	Date:	19th November 2018
Verified by:	John Alderman	Date:	19th November 2018
Approved by:	Andrew Cuthbert	Date:	19th November 2018

Introduction

1. AECOM have undertaken a technical review on behalf of Highways England in respect of the 'Applicant's Response to Highways England Briefing Note 01A' (the "*Applicant's Response*") dated November 2018, prepared by Create Consulting Engineers Ltd. Appendix B of the Response Note presents a geometric swept path analysis illustrated as Drawing No. 1554/03/301 'Taverham Road Low Loader Tracking', dated 26th October 2018.
2. Specifically, this Briefing Note (BN02) addresses a number of issues relating to the proposed use by site traffic of the **A47 Junction with Taverham Road east of Honingham**, which were identified as potentially problematic by Highways England following advice received from AECOM in Briefing Note 01. This BN02 should be read in conjunction with the AECOM BN03 (PIA Review), which comments on the collision record at the junction.
3. The A47/ Taverham Road junction is a simple priority T-junction, which forms a left-right aligned staggered junction with Blind Lane opposite. It does not provide right turning lane facilities for vehicles waiting to turn right into the minor arms of the junction. From an examination of Google street view imagery, Taverham Road appears to be of limited width, with corner radii that may not be suitable for use by large numbers of heavy goods vehicles (HGVs). The junction is on the outside of a large radius bend and visibility for A47 westbound through traffic appears to be sub-standard.
4. It is proposed that Taverham Road should serve as the primary access to two of the three site accesses serving the section of cable run between Ringland and the A47, with the third access via Church Lane, off the A47 Easton roundabout. Transport Assessment (TA) Table 1.5 and Figure 1.2 of Annex 7.8 of the Environmental Statement refer.
5. The advice contained in AECOM Briefing Note 01 in respect of this junction can be summarised as follows:

In the event that the Wind Farm construction precedes the opening of the RIS scheme, AECOM recommend that, in the TA, this junction should be assessed in the following ways:

- *An assessment of the current junction layout against the requirements of DMRB design standard TD42;*
- *An assessment of the collision record of this junction;*
- *If the traffic flow increases are sufficient to warrant it, a PICADY model to determine any capacity problems associated with this junction;*

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- *Consideration should be given to geometric improvements to facilitate the use of this junction by larger numbers of HGVs;*
 - *Alternatively, consideration should be given to banning the right turns into and out of Taverham Road for construction vehicles, making use of the roundabouts at the east end of Honingham bypass and at Easton to facilitate the resulting U-turn movements.*
6. Having reviewed the Environmental Statement and supporting documents, including the Transport Assessment (TA), AECOM updated their advice as follows in Briefing Note 01a:

No assessments of this nature are included in the TA or its supporting documentation.

Table 1.5 of the TA lists two construction site accesses as being accessed via the A47/ Taverham Road junction. These are listed as sites 16 (B) and 17 (B) although on the plan at Sheet 7 of ES Annex 7.8, it would seem more logical to serve sites 17 (B) and 18 (B) from Taverham Road and 16 (B) from Church Lane, Easton. Appendix A shows the total traffic generated by sites 16 (A), 17 (B) and 18 (B) as being 31 two-way light vehicle and 99 two-way HGV movements per day. It would be reasonable to assume that this traffic will be split equally across the three access points, therefore the A47/ Taverham Road junction would have to accommodate up to 66 two-way HGV movements per day. This is unlikely to require a junction capacity model. However, the underlying suitability of this older-style priority junction needs to be questioned for the reasons stated at para 24 above. An assessment of the junction's layout against DMRB standards and the provision of HGV swept path plots to demonstrate its adequacy to accommodate an influx of larger vehicles, together with an assessment of the collision record here would be advisable. It is of note that a collision analysis was undertaken for the A47 to the west of Easton (TA paras 1.4.2.16 – 1.4.2.23) but this covered a section some 2-3km to the west of here and did not include this junction.

Further assessments as recommended above would be beneficial. Alternatively, from the perspective of the safe and free flow of traffic on the Trunk Road, it might be preferable to serve all three access points 16(B) 17(B) and 18(B) from the A47/ Easton roundabout via Church Lane (highway link 126) rather than from Taverham Road (link 125).

7. The Applicant's response to these issues is contained in the document 'Applicant's response to Highways England Briefing Note 01a' (the Applicant's Response) dated November 2018. Sections 2.15 – 2.27 and Appendices B and C of the Applicant's Response address the problems of this junction.
8. Appendix B of the Applicant's Response comprises a drawing (Create Consulting Engineers Ltd drawing no 1554/03/301 dated 26th October 2018), which shows the junction as it currently exists, indicating features relating to its DMRB design compliance and the swept paths of a design heavy goods vehicle (the Design Vehicle) manoeuvring into and out of the minor arm of the junction.
9. Appendix C of the Applicant's Response provides collision data at and in the vicinity of the junction.

DMRB Design Compliance

10. The A47/ Taverham Road junction, as shown on Drawing 1554/03/301, broadly resembles a junction designed to DMRB Design Standard TD42, which is the appropriate standard for a junction of this type. However, there are a number of features of the current layout which give cause for concern.
11. The A47 is not provided with a central 'ghost island' lane to accommodate vehicles waiting to turn right into the minor arm of the junction. At very low levels of traffic flow, this would not be problematic. However, as traffic flows increase, the risk increases of a queue of stationary traffic

forming behind a would-be right turning vehicle waiting for a gap in the opposite direction of flow, a situation exacerbated by the left-right alignment of the stagger between Taverham Road and Blind Lane.

12. The A47 at this location is heavily trafficked for a single carriageway road, with the annual average daily traffic (AADT) being 27,245 with a HGV content of 10% (source: ES Vol 6 Annex 7.3 – Base Traffic Flows). This is significantly above the design capacity of a two-lane single carriageway road of 13,000 (DMRB TA46/97 Table 2.1) and the level at which a ghost island junction would be the preferred option (TD42/95 Figure 2/2) subject to minor arm flow.
13. Highways England has accepted that there is no requirement for a PICADY model of this junction, on the basis of the relatively low additional flow being added to Taverham Road. Neither the TA nor any of the supporting material includes data on the current usage of Taverham Road and in its absence a PICADY model could not be run. There is, however, at this level of flow on the A47, a high risk that vehicles turning into and out of the minor arm of the junction will have to wait a considerable time for a suitable gap in the flow on the A47 to make their turn.
14. The carriageway of Taverham Road scales at 5.0m wide. TD42 does not specify the width of the minor arm of the junction. However, it is based on a 'nominal' minor road width of 7.3m. Any features of the design that are suitable for a 7.3m wide minor road may result in a constrained layout where the minor arm is only 5m wide. This is reflected in our comments on the swept path plots below.



15. The corner radii leading into and out of the minor arm are acceptable at nominally 15m and the tapers provided onto and off the A47 exceed the requirements of the design standard. However, there is no exit taper into the minor arm of the junction, as required by TD42 para 7.7 (b) and its absence is reflected in the swept path plots, which show the Design Vehicle taking up the whole width of the minor arm when turning left from the A47 into Taverham Road.
16. The approach and emerging visibility shown on Drawing 1554/03/301 is acceptable. However, forward visibility for A47 westbound through traffic is below standard and visibility to oncoming traffic for vehicles wishing to turn right into Taverham Road is partially obstructed by foliage in the nearside verge.



Heavy Goods Vehicle (HGV) swept path plots

17. Drawing 1554/03/301 illustrates the swept path of a 16.5 metre long articulated low loader (the *Design Vehicle*) turning into and out of Taverham Road at its junction with the A47.
18. It appears from this drawing that the Design Vehicle can complete left and right turns into and out of the minor arm without encroaching on the kerb or onto the wrong side of the A47. However, it encroaches on to the wrong side of the minor arm in order to complete right turns into and out of Taverham Road and requires the whole width of the minor arm to complete a left-turn into Taverham Road.
19. Taverham Road itself is unlikely to be wide enough, at 5.0m, for two Design Vehicles to pass each other on the straight section on the approach to the junction (vehicle width 2.5m, typically increasing to 3.1m with wing mirrors: the construction plant itself can be wider than the low loader) and would not be sufficiently wide for them to pass elsewhere. The Design Vehicle could pass a car or small van with care on the route but would not be able to enter the minor arm of the junction if a car or small van were waiting to emerge on to the A47. Similarly, a car or small van wishing to enter Taverham Road would have to wait within the bell mouth of the junction for a Design Vehicle to emerge from the minor arm.

Consequences

20. Since the A47 at this location is heavily trafficked and the geometry of the A47/ Taverham Road junction is of a low standard of provision with a narrow minor arm and no central right turn lane, there is already a high risk of vehicles wishing to turn right into Taverham Road having to wait within the westbound running lane of the A47 before they can make their turn.
21. High friction surfacing and 'SLOW' markings present on the A47 westbound approach to the junction indicate that this has been seen as a problem in the past.
22. With the limitations of this layout, the increase in heavy vehicle traffic into and out of Taverham Road would give rise to an increased risk of vehicles becoming stationary within the A47 in both eastbound and westbound directions whilst they wait for a suitable gap in the traffic flow to turn

into Taverham Road, or whilst they wait for a vehicle to emerge from Taverham Road onto the A47.

23. In the case of two Design Vehicles attempting to use the junction simultaneously, there is a risk that this wait could be for an extended period. As the road narrows, there is also the risk that Taverham Road itself could be blocked away from the junction with vehicle queues extending back to the junction.
24. There is also a risk that vehicles emerging from Blind Lane intending to carry on straight ahead into Taverham Road would not be able to see an approaching vehicle in Taverham Road and would turn into the A47, immediately having to stop to let such a vehicle emerge from Taverham Road.
25. Each of these scenarios brings an increased risk of drivers on the A47 encountering stationary traffic at this location, which they may not be expecting to encounter.
26. This is reflected in the pattern identified in the collision data supplied by Norfolk County Council for this junction (see AECOM BN03).

Potential Mitigation

27. A number of steps could be taken to mitigate the potential impact of the use of Taverham Road by construction traffic. These include the following.
 - As a very minimum, the traffic management plan for the construction sites accessed off Taverham Road must prevent two site-related heavy vehicles from attempting to use this junction simultaneously;
 - Clearance of foliage within the westbound highway verge should be undertaken to maximise forward visibility for traffic westbound on the A47;
 - Temporary (black-on-yellow) traffic signs may be needed to warn drivers on the A47 of HGVs turning ahead and of the risk of encountering stationary vehicles in the carriageway;
 - It may be appropriate to deploy vehicle-actuated variable message signs to enhance these warnings;
 - Consideration should be given to banning right turns by construction traffic into and out of Taverham Road at this junction and making drivers go to the Easton and Honingham roundabouts to make the U-turns that would consequently be required in both the inbound and outbound directions;
 - Consideration should be given to making Taverham Road one-way for site traffic (either inbound or outbound) with vehicles in the opposite direction directed to use Church Lane and the Easton Roundabout;
 - Consideration should be given to forbidding site-related HGVs from using Taverham Road as an access point to the site from the A47 and directing all such traffic to the Easton Roundabout, Church Lane and Ringland Road (highway links 126 and 127).

Conclusions

28. AECOM do not consider the unrestricted use of Taverham Road and its junction with the A47 as a satisfactory means of access to construction sites to the north of the A47.
29. Whilst the junction between the A47 and Taverham Road resembles a layout designed to DMRB Design Standard TD42, it has a number of limitations, which would create a high risk of vehicles turning into Taverham Road having to wait within the running lane of the A47 before they are able to make their turn. This will result in stationary traffic on the A47 at this location, which other drivers using the A47 will not necessarily expect to encounter. The analysis of the collision data supplied by Norfolk County Council shows that there is already an accident pattern associated with right turns into Taverham Road at this location.

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30. The increase in HGV traffic associated with the Hornsea Three Wind Farm would increase the risk of drivers on the A47 encountering stationary traffic at this location and, consequently, of the type of collision already present at this junction.
 31. A number of mitigation measures are available to minimise this risk whilst facilitating access to construction sites to the north of the A47.
 32. AECOM recommend that consideration should be given to banning HGV traffic accessing the Hornsea Three Wind Farm construction sites from using the A47/ Taverham Road junction, directing them instead to use the A47 Easton roundabout, Church Lane and Ringland Road. Failing this, it is strongly recommended that the construction management routing plan bans HGVs from making turns into and right turns out of Taverham Road and requires them to use Taverham Road in one direction only.
 33. If, following this review, it is decided that the A47/ Taverham Road junction can be used by HGVs accessing the site, the traffic management plan for the construction sites accessed off Taverham Road should contain the following provisions:
 - A situation in which two site-related heavy vehicles (one inbound, one outbound) attempt to use this junction simultaneously must be prevented;
 - Clearance of foliage within the westbound highway verge should be undertaken to maximise forward visibility for traffic westbound on the A47;
 - Temporary (black-on-yellow) traffic signs should be used to warn drivers on the A47 of HGVs turning ahead and of the risk of encountering stationary vehicles in the carriageway;
 - It may also be appropriate to deploy vehicle-actuated variable message signs to enhance these warnings.
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Project:	Highways England Spatial Planning Arrangement 2016-2020	Job No:	60572359/ DN055.002
Subject:	Hornsea Project Three Wind Farm PIA Review		
Prepared by:	Kathryn Carman	Date:	19th November 2017
Checked by:	Kimberley Pettingill	Date:	19th November 2017
Verified by:	Andrew Cuthbert	Date:	19th November 2017
Approved by:	Andrew Cuthbert	Date:	19th November 2017

Introduction

1. AECOM have been invited to document a review of the Response Note (RN), dated November 2018, presented via email by Create Consulting Ltd in response to AECOMs BN01A (dated 17th October 2018). The RN was received on 2nd November 2018 in support of the Hornsea Project Three Wind Farm development.
2. This Briefing Note (BN03) details the Personal Injury Accident (PIA) review undertaken by AECOM in respect of the A47/ Taverham Road junction. It should be read in conjunction with AECOM Briefing Note BN02, which comprises a review of the DMRB design compliance of the junction and the swept paths of heavy goods vehicles (HGVs).
3. The collision review is set out within **para 2.20-2.26** of the Response note (RN). The PIA data was acquired from Crashmap.co.uk for the last three years, between the end of 2014 to end of 2017, and from Norfolk County Council (NCC) for the five year period between September 2013 and August 2018. The NCC PIA interpretation listing and collision plot which have been used to inform this review are held within **Appendix C** of the RN.
4. For the purpose of this assessment an collision cluster is considered to be a specific location (either a junction including up to 50m of the approaches / exits) where five or more PIAs were recorded within the five year study period (representing an collision rate of at least 1.0 PIA per year). Collision patterns have also been identified where several collisions appear to have occurred under similar circumstances, for example in terms of causation or user type. This review summarises the total number of PIAs throughout the A47/ Taverham Rd junction and the A47/ Blind Lane junction, before examining these by area and setting out the key findings in relation to any identified collision clusters or patterns.

Crashmap PIA Data Review

5. **Paragraphs 2.20 – 2.24** and **Figure 2.1** of the RN suggest that a total of eight PIAs were recorded across the study area from the information provided by crashmap.co.uk, with seven resulting in slight injuries and one in serious injuries. No PIAs recorded within the last three years (up to the end of 2017) resulted in a fatality. AECOM have undertaken an independent review using Crashmap and note that a total of ten collisions were recorded across the study area during the study period. Therefore, two collisions, recorded as slight in severity, have been omitted, bringing

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the total collisions in the study area to ten over the three year period. One of these collisions occurred approximately 35m west of the A47/ Taverham Rd junction and the other at the junction of A47/ Blind Lane. Given the RN is dated November 2018, there doesn't appear to be a logical explanation as to why these two collisions have been omitted.

6. AECOM agree with conclusions drawn in **para 2.21 and 2.22**, however AECOM disagree with **para 2.23** that states 'the next closest collision to the A47/Taverham Road junction was recorded on 4th May 2018, approximately 50m to the west on the A47, as a collision recorded as slight in severity involving two vehicles and resulting in one casualty occurred on 08/11/17 approximately 35m west of the A47/ Taverham Rd junction. Additionally, AECOM disagree with the conclusion drawn in **para 2.24** as given the limited information provided via the free to access crashmap.co.uk, there is insufficient information for these conclusions to be drawn.
7. AECOM have reviewed the crashmap.co.uk information and given that six PIAs have been recorded within 50m of the A47/ Taverham Rd junction in the last three years (up to the end of 2017) this represents a collision rate of 2.0 per year in the immediate vicinity of the junction and highlights a collision cluster at this location.

NCC PIA Data Review

8. A total of 11 PIAs were recorded across the study area from the information provided by NCC, with 10 PIAs involving slight injuries and one involving serious injuries. No PIAs recorded within the last five years (up to the end of August 2018) resulted in a fatality. A total of six PIAs (ref: NC97244, 204706, 203892, 211179, 241345, 248124) were recorded within 50m of the A47/ Taverham Rd junction and appear to be associated in some way with the A47/ Taverham Rd junction.
9. The RN did not detail any analysis of the NCC data nor did it refer to the number of PIAs that occurred each year within 50m of the A47/ Taverham Rd junction and associated in some way with the A47/ Taverham Rd junction. AECOM has provided this information as part of this review. The results are presented below in **Table 1**.

Table 1: Number of PIAs that occurred each year within the study area

Year Period	Number of Recorded PIAs
01/09/2013 - 31/08/2014	1
01/09/2014 - 31/08/2015	2
01/09/2015 - 31/08/2016	1
01/09/2016 - 31/08/2017	5
01/09/2017 - 31/08/2018	2
Total PIAs	11
Average PIAs Per Year (overall period)	2.2

10. The results in **Table 1** indicate that the collision rates in the vicinity of the A47/ Tavern Rd junction were considerably higher than the overall average during the fourth year (01/09/2016 – 31/08/2017) of the study period, and subsequently fell to below the average collision rate during the most recent three year period. However the overall collision rate throughout the five year period is greater than 1.0 and therefore overall does raise concerns relating to the recent collision record at this location.
11. As mentioned above in **para 8** above, although a total of 11 PIAs were recorded in the study area, only six PIAs were recorded within 50m of the A47/ Taverham Rd junction and associated in some way with the A47/ Taverham Rd junction. Therefore AECOM has undertaken detailed analysis of the PIA data relating to these six collisions as part of this review.
12. Five of the PIAs were classified as slight in severity and one PIA was recorded as serious in severity. The PIA recorded as serious in severity (ref: 211179) occurred during day light hours when the road surface was dry in July 2017. The collision resulted in a rear end shunt when vehicle two slowed and stopped to turn right into Taverham Road (from the east) and vehicle one failed to

stop. In addition, three other PIAs (ref: NC97244, 204706, 203892) occurred as a result of rear end shunt collisions when vehicles travelling in an east to west direction, then stopping to turn right into Taverham Road, were hit by vehicles approaching from the east and failing to stop.

13. Of the four above mentioned rear end shunt type collisions at this location, three occurred during the hours of daylight in fine and dry conditions, therefore there appears to be no further contributing factors to those collisions.
14. Given that four collisions occurred under similar circumstances (in terms of location, direction and collision type), it is considered that this constitutes a collision pattern at this location. Given the increase in long/HGV vehicles expected as a result of the Hornsea Project Three Wind Farm, AECOM recommend that the collision pattern at this location is reviewed more thoroughly to determine the reason why these collisions are occurring; and that suitable mitigation is put in place; or that alternative access arrangements are sought.
15. AECOM Briefing Note BN02, comprising a review of the DMRB design compliance of the junction and the swept paths of HGVs, provides a list of potential mitigation measures and possible alternative access arrangements.
16. PIA ref: 248124 involved a car and a good vehicle (of unknown weight) and resulted in one casualty. This PIA occurred as a result of a rear end shunt collision, when a vehicle travelling west to east along the A47, failed to stop and collided with a stationary vehicle that had just emerged (turned left) from Taverham Road.
17. PIA ref:241345 involved two cars with one casualty and occurred as a result of a side swipe collision, when a vehicle travelling southbound along Taverham Rd turning right onto the A47 westbound, failed to stop and collided with an approaching westbound A47 mainline vehicle.

Conclusion

18. Given that six PIAs occurred within 50m of the junction during the last five year study period, AECOM consider that this is a collision cluster. In addition, four collisions were rear end shunt collisions when vehicles travelling in an east to west direction, then stopping to turn right into Taverham Road, were hit by vehicles approaching from the east and failing to stop. Because these collisions occurred under similar circumstances (in terms of location, direction and collision type), it is considered that this constitutes a collision pattern at this location. As a result AECOM do not agree with the conclusion drawn in **para 2.26** of the RN.
19. It is recommended that the collision pattern at this location is reviewed more thoroughly to determine the reason why these collisions are occurring; and that suitable mitigation is put in place; or that alternative access arrangements are sought to prevent exacerbating the current collision rate at the A47/ Taverham and A47/ Blind Lane junctions specifically with regards to the access and egress movements associated with HGVs as part of the Hornsea Project Three Wind Farm development.