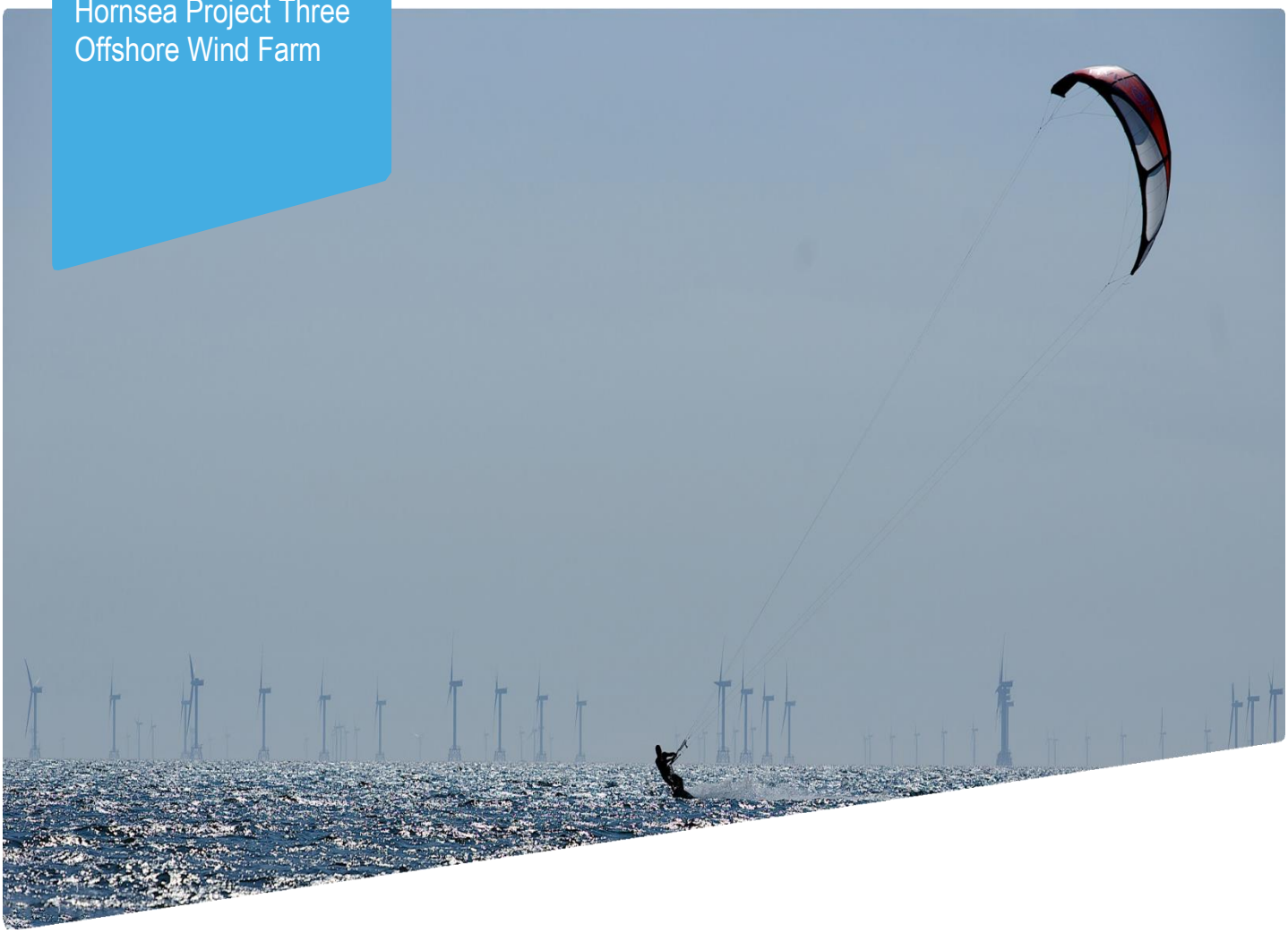
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Statement of Common Ground between Hornsea Project Three (UK) Ltd. and Highways England

Date: March 2019

Hornsea 3
Offshore Wind Farm

Ørsted

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2018.

Revision History

Version	Date	Author	Context
1	23.10.2018	Ørsted	Initial draft for discussion with Highways England
2	25.10.2018	Ørsted	Second draft following meeting with Highways England
3	06.11.2018	Ørsted	Final draft for signing
4	06.11.2018	Ørsted	Final for submission
5	02.01.2019	Ørsted	Draft for discussion with Highways England ahead of Deadline 4
6	11.01.2019	Ørsted and Highways England	Updated draft with input from Highways England
7	14.01.2019	Ørsted	Updated Draft
8	14.01.2018	Ørsted	Final draft for signing
9	06.03.2019	Ørsted	Draft for discussion with Highways England ahead of Deadline 7
10	12.03.2019	Ørsted and Highways England	Updated draft with input from Highways England
11	12.03.2019	Ørsted	Final draft for submission

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Abbreviations

Abbreviations	Description
DCO	Development Consent Order
CEA	Cumulative Effect Assessment
CoCP	Code of Construction Practice
CTMP	Construction Traffic Management Plan
EIA	Environmental Impact Assessment
Ex.A	Examining Authority
EMP	Ecological Management Plan
EWG	Expert Working Group
HVAC	High Voltage Alternating Current
HVDC	High Voltage Directional Current
LMP	Landscape Management Plan
MHWS	Mean High Water Springs
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
SoCG	Statement of Common Ground
TWT	The Wildlife Trust
WSI	Written Scheme of Investigation

1. Introduction

Overview

1.1 This Statement of Common Ground (SoCG) has been prepared by Ørsted Hornsea Project Three (UK) Ltd. ('the Applicant') and Highways England (HE) (together 'the parties') as a means of clearly stating the areas of agreement, and any areas of disagreement, between the two parties in relation to the proposed Development Consent Order (DCO) application for the Hornsea Project Three offshore wind farm (hereafter referred to as 'Hornsea Three') with regard to the impact that the development will have upon the Strategic Road Network in Norfolk. This SoCG does not deal with or extend to any development other than Hornsea Three.

Approach to SoCG

1.2 This SoCG has been developed during the pre-examination and examination phase of Hornsea Three. In accordance with discussions between the parties, the SoCG is therefore focused on those issues raised by Highways England (HE) within its response to Scoping, Section 42 consultation, pre-application and post-application consultation between the parties. In particular this SoCG addresses matters raised by AECOM on behalf of Highways England (HE) in the Briefing Note 01A (BN 01A) dated 17th October 2018, Briefing Note 02 and Briefing Note 03 both dated 19th November 2018, and Briefing Note 04 (BN04) dated 6th March 2019 and other correspondence (including REP2-029).

1.3 The structure of this SoCG is as follows:

- Section 1: Introduction;
- Section 2: Consultation;
- Section 3: Agreements Log;
- Section 4: Conclusions and Further Work

Hornsea Three

1.4 Hornsea Three is a proposed offshore wind farm located in the southern North Sea and will include all associated offshore (including up to 300 turbines) and onshore infrastructure.

1.5 The Hornsea Three offshore cable corridor extends from the Norfolk coast, offshore in a north-easterly direction to the western and southern boundary of the Hornsea Three array area. The Hornsea Three offshore cable corridor is approximately 163 km in length.

1.6 From the Norfolk coast, underground onshore cables will connect the offshore wind farm to an onshore HVDC converter/HVAC substation, which will in turn, connect to an existing National Grid substation. Hornsea Three will connect to the Norwich Main National Grid substation, located to the south of Norwich. The Hornsea Three onshore cable corridor is approximately 55 km in length at its fullest extent.

Application Elements Relevant to the Strategic Road Network

1.7 The onshore works (work Nos. 6 to 15) detailed in Part 1 of Schedule 1 of the draft DCO (Document A3.1) describe the elements of Hornsea Three which may affect the interests of HE.

1.8 The key areas of interest to Highways England relate to the impact of the proposals on the safe and efficient operation of the Strategic Road Network (SRN), during construction and following completion when it is brought into operation. This relates to.

- The impact on various junctions along the Strategic Road Network;
- The impact on the A47 at Easton and the A11 at Hethersett of the construction of HDD cable crossings under the carriageway of the Trunk Road;
- The impact on the Road Investment Strategy (RIS) schemes for the A47 between North Tuddenham and Easton and for the A11/A47 Thickthorn junction;
- The impact of HGV traffic accessing construction sites and the construction compound via junctions and accesses on the A11 and A47 in the vicinity of Easton, Honingham and Hethersett;
- The impact of HGV traffic associated with the construction of a new substation adjacent to the SRN at Swardeston; and
- The effect of construction workforce vehicles at the A47/A1074 Longwater junction, the A47/ A140 Harford junction and B1113/A140 junction.

2. Consultation

2.1 The Applicant has engaged with HE regarding Hornsea Three during the pre-application and post-application process, both in terms of informal non-statutory engagement and formal consultation carried out pursuant to section 42 of the Planning Act 2008. In addition, formal consultation has been undertaken at various stages of the project including consultation through scoping, Section 42 consultation on the Preliminary Environmental Information Report (PEIR), further section 42 consultation undertaken in November 2017 and the focused section 42 consultation in February 2018. In additional, formal consultation was undertaken in accordance with S56 consultation requirements.

2.2 Consultation has continued post-submission and throughout the Examination phase.

3. Agreements Log

3.1 The following section of this SoCG identifies the level of agreement between the parties for each relevant component of the application (as identified in paragraph 1.7 and 1.8). In order to easily identify whether a matter is “agreed”, “under discussion” or “not agreed”, a colour coding system of green, yellow and orange, respectively, is used in the “final position” column to represent the respective status of discussions.

Table 3.1: Traffic and Transport.

Discussion Point	The Applicant's Position	Highways England Position	Final Position
Design – Cable crossing of SRN: HDD	The use of Horizontal Directional Drilling (HDD) to cross all public roads, including those within the strategic road network, is considered appropriate. Detailed crossing method statements will be provided for the Strategic Road Network Crossings (A47 and A11, HDD 31 and HDD 8 respectively) during the detailed design stage, as set out in paragraph 1.3.2.1 of the Outline Code of Construction Practice (CoCP) [APP-179]. As agreed with Highways England on 24.10.2018, the Applicant will provide the necessary Geotechnical Risk Report and Preliminary Sources Study for each crossing, likely as an appendix to the detailed crossing method statements which will be developed in consultation with HE.	HE considers the use of HDD at Strategic Road Network crossings (A47 and A11, HDD location 31 and HDD location 8) to be appropriate The use of HDD would not require a S278 agreement. HE agrees that, in line with requirements of DMRB HD22 and HA120, the geotechnical risk report and Preliminary Sources Study Report (PSSR) for the two crossing locations should be provided during detailed design, and is content for these to be appended to the detailed crossing method statements which will be developed in consultation with HE. Detailed proposals should be submitted at least six months prior to the anticipated start-of-works at HDD locations 8 and 31 to allow a Section 50 Licence (New Roads And Street Works Act 1991) to be entered into and a Geotechnical Certificate to be issued by HE.	**Agreed**
Design – Cable crossing of SRN: Interaction with RIS schemes	Consultation undertaken with HE in respect to the two RIS schemes (A47 Tuddenham to Easton and A47/A11 Thickthorn Junction) is considered appropriate	The proposed crossing points are located in the vicinity of the A47 Tuddenham to Easton and A47/A11 Thickthorn Junction RIS schemes	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	The design of the onshore cable corridor and Application allows sufficient flexibility that HDD could be utilised at the point of crossing should there be certainty that the A47 dualling scheme would come forward. Hornsea Three will continue to consult with HE during detailed design as the A47 dualling scheme is further developed. The approach is appropriate. Where appropriate site-specific measures will be identified and developed as part of the final CTMP to manage the interaction at access points.	<u>A47/A11 Thickthorn Junction (HDD location 8)</u> The proposed cable crossing of the A11 lies beyond the extent of the works proposed as part of the A11 Thickthorn Junction RIS scheme; therefore, cable crossing works on the A11 at this location are unlikely to have an impact on the delivery of the A11 Thickthorn RIS scheme <u>A47 Tuddenham to Easton (HDD location 31)</u> At this time, it is too early to confirm the delivery programme for the respective works. Consequently it is not known if the cabling will be delivered before, during or after the A47 dualling works have been completed. In the event that the cabling works precede the A47 dualling scheme, the Applicant will deliver the cable crossing point across the existing road and provide enabling works to facilitate crossing of the future dualling and any connecting roads forming part of the scheme. One of the local road accesses from the Church Lane, Northern side of A47 at Easton	

Discussion Point	The Applicant's Position	Highways England Position	Final Position
		roundabout may have a potential issue of a clash with the Construction Traffic Movements proposal. Agreement and approval of detailed site access arrangements will be covered in the Detailed CTMP.	
Design – Cable crossing of SRN: Interaction with RIS schemes (Implementation post-A47 delivery)	The Applicant note that should the A47 dualling scheme not have been fully delivered prior to the construction of Hornsea Three, there would be a need for the Applicant to consult with Highways England during the finalisations of construction specification, methodology and logistics. Such consultation will then inform the development of the final CoCP and final CTMP secured by means of Requirement 17 and 18 of the DCO respectively.	In the event that the cabling work occurs at the time of or after construction of the A47 dualling scheme, the developer will need to HDD through the full section of the new road alignment. However, if works take place prior to, or at the same time as the new scheme (A47 dualling), HE agree that there would be a need for the Applicant to liaise with HE in respect to construction specification, methodology and logistics.	**Agreed**
Design – Cable crossing of SRN: Converter/ Substation Access	The onshore HVDC converter/HVAC substation will be accessed directly from the B1113 as opposed to the A47. This design is appropriate.	Access to the onshore HVDC converter/HVAC substation will be from the Mulbarton Road B1113. There will be no direct access off the SRN.	**Agreed**
Design – Cable crossing of SRN:	The site for the main construction compound is considered too remote from HE's Strategic Road	HE agrees that the main construction compound is located remotely from the	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
Main Construction Compound	Network (SRN) such that any impact from these proposals would be minimal on the SRN. As such, although HE will be kept informed of the ongoing discussions, detailed discussions regarding the design and suitability of the access strategy for the onshore main construction compound will continue with NCC, BDC and Oulton Parish Council. This approach is appropriate.	Strategic Road Network (SRN), consequently it is unlikely to have an impact on the operation of the SRN.	
Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement (APP-079) and Volume 6, Annex 7.1: Transport Assessment (APP-159)			
Planning and Policy	Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement has identified all appropriate plans and policies relevant to traffic and transport and has given due regard to them within the assessments. This includes DfT Circular 02/2013.	HE has not raised any specific points in respect to planning policy.	**Agreed**
Baseline and Assessment methodology	The baseline information utilised to inform the assessment and the methodology used to assess impacts on traffic and transport in Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement is appropriate.	HE has not raised any specific points in respect to the baseline information which would affect the outcomes of the assessment or its associated mitigation.	**Agreed**
Assessment conclusions	The assessment of potential effects on the local highway network is appropriate subject to the measures identified within Volume 3, Chapter 7: Traffic and Transport of the Environmental	HE is satisfied with the assessment provided.	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	Statement, which includes the preparation of a detailed Construction Traffic Management Plan.		
	The assessment presented within the Transport Assessment rev 2 and Clarification Sheets (issued to HE on 26th September 2018 and submitted as Appendix 31 and 32 to the Applicant's response at Deadline 1) is appropriate and accurate – with the exception of the individual points identified by HE in their Briefing Note 01A (Provided as part of Appendix A to this SoCG).	HE has provided comments relevant to the Transport Assessment Rev2 and clarification sheets in Briefing Note 01A. HE have not raised further comments on the remainder of the TA Rev2 and clarification sheets.	**Agreed**
	Responses provided by Hornsea Three, in response to the comments raised by HE in their Briefing Note 01A (Appendix A), are considered appropriate. The responses are provided in Section 5 as part of Appendix "a" to this SoCG. The matters raised in these previous briefing notes are contained within separate rows below.	These responses were provided on 2nd November. They have been reviewed by AECOM on behalf of Highways England. As noted below, AECOM's further advice to HE is contained in Briefing Notes BN02 and BN03. All outstanding points raised in these Notes are contained within separate rows below.	**Agreed**
	The use of the A47/A1074 Longwater junction, A47/ A140 and B1113/A140 junctions by workforce during construction is likely to be low proportionate to the existing movements on the network and due to working hours (paragraph 4.1.1.1 of the Outline CoCP [APP-179], the movements may well be outside of the normal network peak. Consideration will be given to the	HE agrees with this approach and considers that no further work beyond the provision of likely movements to inform a sensitivity test is required. HE is satisfied that the outcomes of the sensitivity test will be used to identify site-specific measures to be included in the detailed Construction Traffic Management Plan CTMP post-consent.	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	use of these junctions by the construction workforce, as well as the need for specific traffic management measures, post-consent and secured, where necessary, through the final CTMP(s) secured under Requirement 18 of the draft DCO. Notwithstanding this, in line with discussion with HE, the Applicant will provide HE with the number of anticipated construction vehicles movements through these locations shortly to inform a sensitivity test which will subsequently be used to inform the detailed CTMP post-consent. The Applicant will engage with HE to include measures within the detailed CTMP which manage construction traffic where appropriate. The need for and location of on-site monitoring will be discussed and agreed with HE during the detailed design phase, once there is additional clarity on traffic flows at peak periods. The Applicant has undertaken additional baseline traffic link surveys at the A47 / A140 junction and A47 / A1047 junction to define the existing hourly traffic levels through these locations to inform any time use restrictions at these junctions by the construction workforce and deliveries, (automatic traffic count survey completed week commencing 3rd December). Based on the information provided to HE, the Applicant is confident that no significant	It is agreed that the CTMP will be developed to ensure those junctions mentioned will operate, as far as practicable in a safe and efficient manner. Where traffic modelling or on site monitoring determines that this is not the case, suitable measures will be required, such as working hours restrictions on construction sites in the vicinity, and the provision of queue length detectors on A47 slip roads linked to Variable Message Signs alongside the main carriageways of the A47 to advise drivers approaching these junctions of the risk of encountering excessive amounts of queueing traffic. Suitable measures will be based on trigger points to be agreed where construction traffic levels exceed acceptable levels. On-site monitoring and mitigation measures such as those set out above must be implemented for the duration of the works to the satisfaction of Highways England and in compliance with its usual standards and policies in place at the time.	

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	effects are expected at this location and as such, no additional management measures beyond those already included within the Outline CTMP are required. The principles of any agreed measures included within the Outline CTMP before the end of the Examination, will form the basis for the final CTMP (secured under Requirement 18 of the DCO	HE agrees with this approach and acknowledges that the additional baseline data, together with the anticipated core working hours of the construction sites of 0700 - 1800, shows that the majority of the impact of these sites will take place outside of the network peak hours. HE is therefore confident that any residual impacts can be addressed by means of the final CTMP..	
	Based on comments provided by HE, and subject to the sensitivity testing referred to above, no junction capacity assessment or collision assessment is required at the following locations;	HE has discussed the capacity and characteristics of these junctions with the Applicant. HE is content that no junction capacity modelling or other analysis is required except in the two locations listed below. <u>A140/B1113</u> The impact of the proposals on the A140/ B1113 junction has been agreed between the Applicant and Norfolk County Council (NCC). HE initially required confirmation from NCC of their acceptance of the impact of construction traffic on this junction, in order to address the risk of a queue of traffic tailing back to, and affecting the operation of, the A47/ A140 junction.	**Agreed**

	• A47/B1535 junction; • A47 to the west of Easton; • A47 Easton roundabout (subject to measures such as those set out in paragraph 2.2.1.1 of the Outline CTMP being implemented at this location); • A47/ A1074 Longwater junction • A47/B1108 Colney junction; • A11/ Station Lane, Hethersett; • A11 to the south-west of Thickthorn junction; • A11/A47 Thickthorn junction (though the final CTMP will include a commitment to restrict the use of Cantley Lane – see CTMP section below); • A47/A140 Harford junction (subject to measures such as those set out in paragraph 2.2.1.1 of the Outline CTMP being implemented at this location); • A47/A146 Trowse junction; and • A47/ A1270 Postwick Junction. The Applicant has received agreement from NCC that in regard to the A140/B1113 junction, no significant effects are anticipated and that any impacts can be managed through measures to be developed within the detailed CTMP (this position is set out in the NCC SoCG submitted at Deadline 4).	However, if the junction mentioned above will not be operating in a safe and efficient manner, or where traffic modelling or on site monitoring determines that this is not the case, suitable mitigation measures will need to be developed in consultation with Highways England and NCC. . HE understand that agreement has now been reached between the Applicant and NCC that no significant effects are anticipated and that any impacts can be managed through measures to be developed within the detailed CTMP. HE have no further concerns about the operation of this junction.	

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	Based on discussions with HE, the Applicant has agreed to provide, at the A47/Taverham Road Honingham junction – Collision assessment, DMRB compliance check including visibility measurements and swept path analysis for construction vehicles. A PICADY model of this junction is not required. Discussion with HE and NCC has identified a need for intervention measures at this location. An outline scheme was included within the Outline CTMP, submitted at Deadline 6. Further discussions with HE identified some minor amendments which have been incorporated into a revised scheme to be included within the Outline CTMP to be submitted at Deadline 8, with the detailed design to be developed as part of the final CTMP (secured under Requirement 18 of the DCO). The Applicant understands that the scheme now currently proposed is acceptable and agreed in principle by Highways England (as well as Norfolk County Council).	<u>A47/Taverham Road Honingham Junction</u> The Applicant has now provided the collision assessment, DMRB compliance check and HGV swept paths. HE's review of this material, documented in AECOM BN02 and BN03, revealed a need for an Intervention at this junction to maintain the safe and free flow of traffic on, off and along the A47, which would otherwise have the potential for a severe impact. The Applicant developed and discussed an outline scheme with HE and NCC at a meeting on 25th January. The updated mitigation scheme proposed at the A47/ Taverham Road junction, illustrated on Drawing 1554/03/300 Rev D, dated 7th March 2019, with heavy goods vehicle swept paths illustrated on Drawing 1554/03/306 Rev A, also dated 7th March 2019, which the Applicant will submit at Deadline 8, appears to have addressed all of the issues previously raised by Highways England and Norfolk County Council and can now be accepted as suitable with Highways England's agreement in principle to the mitigation measures proposed. AECOM BN04 (Appendix C of this	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
		SOCG) provides further details of the technical matters agreed. The agreed outline scheme will be included within the Outline CTMP, with the detailed design to be developed as part of the final CTMP.	
	The projects screened into the cumulative effect assessment in Volume 3, Chapter 7: Traffic and Transport of the Environmental Statement were appropriate at the time of submission of the DCO application, and cumulative impacts were satisfactorily assessed. Where committed developments have arisen since the original DCO application, it is considered that any implications on traffic and transport assessment would not change the mitigation required, which therefore remains as proposed within the Environmental Statement. A cumulative link threshold assessment was presented for Hornsea Three and Norfolk Vanguard as part of Deadline 6 (REP6-039). As agreed with Highways England in a meeting on 25th January, no significant effects are expected on the strategic road network and as such the strategic road network was not scoped into this cumulative assessment.	HE considers the cumulative effect assessment to be appropriate, with measures to manage construction traffic to be secured through the detailed CTMP post-consent.	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
Outline Construction Traffic Management Plan (APP-176) and Outline Code of Construction Practice (APP-179) as appropriate			
Construction traffic management	The principles set out in the Outline Construction Traffic Management Plan are appropriate. Further detail and site specific measures will be developed in the final CTMP(s) secured under Requirement 18 of the draft DCO (Document Reference A3.1). Notwithstanding this, based on post-application discussions with HE, the Applicant has made the following amendments to the Outline CTMP (new text shown in underline): Newly created paragraph 2.2.1.2 *"Engagement with Highways England has identified the A47 Taverham Road Honingham junction, A47 Easton Roundabout, A47/A1074 Longwater junction, A47/ A140 junction and B1113/A140 junction as locations which will require measures such as the above, particularly in respect to encouraging staff movements outside of the network peak."* Newly created paragraph 2.1.3.5 *"No HGV movements will be permitted on Cantley Lane, close to the A11/A47 Thickthorn junction."*	HE considers the principles set out in the Outline CTMP to be appropriate, including the proposed amendments. Further site-specific detail will be provided in the final CTMP to be agreed post-consent.	**Agreed**
Travel Plans	The decision not to create a standard Travel Plan for onshore works, due to the linear and rural location of the project, is appropriate. However, in	Position Agreed.	**Agreed**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	line with discussions with NCC, the Applicant will provide a Travel Plan during Examination.		
Abnormal loads	The impact of abnormal loads on traffic and transport receptors has been adequately assessed. The management measures detailed in Outline Construction Traffic Management Plan (Document Reference A8.2) for abnormal loads are appropriate in principle. Further detail and site-specific measures will be developed in the final CTMP(s) secured under Requirement 18 of the draft DCO). The Applicant highlights that it intends, through the development of the Outline CTMP (APP-176), to continue to monitor and consider the impact of Abnormal Indivisible Loads associated with the delivery of cable drums to both the main construction compound and to secondary compounds, as well as direct to the onshore cable corridor. In this regard, the Applicant will give due consideration to transformer abnormal loads to demonstrate feasibility of access to the onshore HVAC booster and onshore HVDC converter/HVAC substation and the details of any specific link works to accommodate the movement of abnormal loads will be confirmed in the final	At this stage it is not possible to understand fully the impacts of abnormal loads on the SRN, as the applicant has not provided the port location to be used for this project and consequently abnormal load routeings have not yet been identified. The routeings will be reviewed once further information on routeing is provided. Any approval will be provided by the Highways England's Abnormal Loads team. HE will require agreement to be reached prior to any onshore site construction takes place. Any approval will include where necessary site-specific measures to accommodate the abnormal loads along the specified routeings. HE are content that the commitment made by the Applicant to undertake this work is sufficient for this issue to be agreed.	**Agreed.**

Discussion Point	The Applicant's Position	Highways England Position	Final Position
	CTMP(s) secured under Requirement 18 of the draft DCO).		

4. Conclusions and Further Work

4.1 This SoCG has been developed between with HE and the Applicant to provide an overview of the impact of the proposed development on the Strategic Road Network and sets out where agreement has been reached between the parties on matters arising and where further work is required.

4.2 Following consideration of the evidence base, HE is in agreement with the Applicant that the transport modelling evidence base, and other submitted documentation provides a broad overview of the impact of the proposals on the Strategic Road Network and subject to outstanding matters set out in this document and summarised below, there are no identified showstoppers and that there is the potential to mitigate against and minimise to an acceptable level any impact of the proposal on the efficient and safe operation of the SRN. Following extensive engagement between the parties during the Examination period, all matters have now been agreed with no outstanding points under discussion.

Appendix A - Applicant's Response to Highways England Briefing Note 01A

Version	Date	Author	Context
1	November 2018	Create Consulting Ltd	Final version for issue

Acronyms

Acronym	Definition
AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Counter
DfT	Department for Transport
DoS	Degree of Saturation
HGVs	Heavy Goods Vehicles
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
TEMPRO	Trip End Model presentation Programme
PCU	Passenger Car Units
PRC	Practical Reserve Capacity
PRoW	Public Rights of Way

Introduction

4.3 This document provides a response to the issues raised by AECOM on behalf of Highways England (HE) in the Briefing Note 01A (BN 01A) dated 17th October 2018 and clarification where appropriate. BN 01A is included as Appendix A of this response.

4.4 BN 01A builds upon an earlier briefing note issued by AECOM (BN01) which related to the Preliminary Environmental Information Report (PEIR) prepared for the proposed Hornsea Three Wind Farm. BN01A therefore provides feedback as to whether issues raised by AECOM (in BN01) have been addressed in the updated Transport Assessment (v2) and Transport Assessment Clarifications dated September 2018, which are provided as Appendix 31 and 32 in the Applicant's response to Deadline 1, as well as identifies any outstanding matters of concern.

Highways England Comments/Create Response

4.5 The BN01A breaks down the evaluation of the transport submissions into specific sections for review, these have been emulated below with Create's response to each section where necessary.

Policy Considerations

4.6 The issue regarding Circular 02/2013 has now been clarified at para 1.2.1.3 of the Transport Assessment v2 (hereafter referred to as TA v2) to the satisfaction of AECOM.

Main Impacts

4.7 Paragraph 11 of the BN01 states:

"Having carried out a review of the documents, AECOM consider the principal impacts likely to be of concern to Highways England will be:

- *The impact on the A47 at Easton and the A11 at Hethersett of the construction of TT cable crossings under the carriageway of the Trunk Road;*
- *The relationship between the works proposed at these locations and the RIS schemes for the A47 between North Tuddenham and Easton and for the A11/A47 Thickthorn junction.*
- *The impact of HGV traffic accessing construction sites and the construction compound via junctions and accesses on the A11 and A47 in the vicinity of Easton, Honingham and Hethersett;*
- *The impact of HGV traffic associated with the construction of a new substation adjacent to the SRN at Swardeston;*

- *The impact of HGV traffic carrying materials between the construction compound and the work sites."*

4.8 AECOM confirmed in BN01A that there is nothing in the TA (v2) to suggest that the main impacts of concern to Highways England will be other than these.

Impact Assessments

4.9 Paragraphs 12-14 of BN01 states:

"The PEIR proposes use of the Guidance on the Environmental 12. Assessment of Road Traffic (GEART) to determine the significance of environmental impacts. The TA is to be prepared in accordance with the (now withdrawn) DfT Guidance on Transport Assessment.

The PEIR proposes that impacts will be screened in accordance with the following criteria:

- *Highway links with an increase in flow (or an increase in HGV flow) of more than 30%; and*
- *In specifically sensitive areas, highway links with an increase in flow (or an increase in HGV flow) of more than 10%.*

Highway links where the increase in total flow or HGV flows are predicted to be less than 10% will be screened out of the assessment. AECOM acknowledge that this is the 'industry standard' approach for the sort of impacts considered in an EIA. However, it should be noted that Circular 02/2013 can require detailed scrutiny of traffic capacity and road safety impacts at significantly lower thresholds."

4.10 The AECOM response to this in BN01A is:

"The TA does not explicitly acknowledge this point. However traffic flow increases of less than 10% are tabulated in Tables 1.7 & 1.8 of the TA and therefore this comment has de facto been addressed. Further consideration of the significance of the increases reported in the TA is discussed in the sections which follow.

4.11 Paragraph 16 of BN01 states:

"It should be noted that the way the HGV movements are presented does not always allow the potential useage of individual access points on the SRN to be quantified. AECOM recommend that an estimate be made of the numbers likely to arise from each construction compound and site access. This is particularly important for construction compound C1, which is to be accessed via the A47/B1535 junction at Honingham and in section 7.10, its traffic generation is aggregated with ten individual construction access points, the majority of which would be served from the north, via the A1067. So it is not possible to determine the extent to which traffic flows at the A47/B1535 junction would increase. This should be clarified in the TA."

4.12 The AECOM response to this in BN 01A is:

'Table 1.5 of the TA clarifies the split between construction access points accessed via the A1067 and via the A47 and Appendix A of the TA allocates traffic accordingly. However, the proposed route for traffic accessing site access 19 (C) is not stated in Table 1.5 nor in Appendix A. This should be clarified. In addition, construction compound C1 is no longer located on the B1535 and the TA appears to propose that no construction traffic will be routed via the B1535.'

4.13 To confirm, the construction compound C1 is no longer being proposed as being accessed off the B1535 and therefore, no construction traffic should be assigned to/from this specific location.

4.14 Paragraph 17 of BN01 states:

"AECOM note that no similar exercise appears to have been undertaken in respect of either motor vehicle trips generated by the workforce; or by HGVs on the wider network, moving materials between quarries, railheads and/or ports and the cable corridor. Many of these routes will utilise substantial lengths of the SRN and may be significant at locations close to the source of the materials, for example at the first point of access to the SRN from the selected base port. These additional sources of traffic should be assessed in the TA."

4.15 The AECOM response to this in BN01A is:

"The TA acknowledges this point at paras 1.6.2.19 and 1.6.2.27, where two alternative percentage distributions of HGV traffic are proposed. Tables 1.6 & 1.7 of the TA assign traffic to the A14 east and west of the study area and to the A11 south. No explicit consideration is given to individual junctions in the vicinity of railheads or base ports and no rationale is given for not doing so. HGV traffic forecast to use the A146 (SE of Norwich) and A140 (S of Norwich) is not tabulated. HGVs are assigned to these routes in the traffic flow diagrams in Appendix B of the TA but the numbers assigned to each of these routes is minimal."

4.16 Paragraph 19 of BN01 states:

"The anticipated construction phasing should be clarified before work on the TA commences because it will be critical to ensuring that the correct scenarios are assessed."

The AECOM response to this in BN 01A is:

'The inter relationship between the wind farm proposal and the RIS schemes is referenced at para 1.7.9.1 of the TA, where it states that initial discussions have taken place (although it says that these have been with NCC, not with HE – presumably a misprint) and that further discussions will take place post submission. Provided these discussions are meaningful and ongoing, this point has been addressed.'

4.17 Create can confirm that said discussions are both meaningful and ongoing.

Location-Specific Impacts

A47 Junction with B1535 west of Honingham

4.18 The access (referred to above) is no longer proposed via B1535 and therefore, no further action is required relating to this matter.

A47 Junction with Taverham Road east of Honingham

4.19 Paragraph 26 of BN01 states:

"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;*
- *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."*

4.20 The AECOM response to this in BN01A is:

"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).”

4.21 Due to the low levels of proposed traffic associated with Hornsea Three, Create will not be providing a junction capacity model for the A47/Taverham Road junction.

4.22 Create has undertaken swept path analysis of HGV vehicles at the A47/Taverham Road junction to determine the suitability of the existing road layout and identify and also provide and account of existing geometry and visibility at this junction (A47/Taverham Road). The swept path analysis and geometric and visibility assessment is provided at Appendix B. There would appear to be no significant deficiencies at this location with respect to major/minor arm geometry and levels of visibility readily satisfy 215m x 4.5m x 215m for an estimated 100kph design speed. We also note the inclusion of merge and diverge tapers at this junction, which typically aid the movements of larger, slower moving vehicles to/from the minor arm.

4.23 It is noted that there are currently some issues with overrunning on the minor arm of the A47/Taverham Road junction, however, the track run analysis indicates that the required Hornsea Three HGV movements would be contained within the existing kerb lines. The existing overrunning appears to be principally associated with existing agricultural vehicles. This junction would, however, be included within the overall Construction Traffic Management Plan for the Hornsea Three scheme and should there be significantly increased wear and tear at this junction that can be directly associated with the scheme, then remedial action can be taken accordingly.

4.24 To address the AECOM concerns regarding the A47/Taverham Road junction a review of road safety has been carried out using the “Crashmap” recorded personal injury accident database. The review includes three years of accident data to the end of 2017 as shown in Figure 2.1 below:

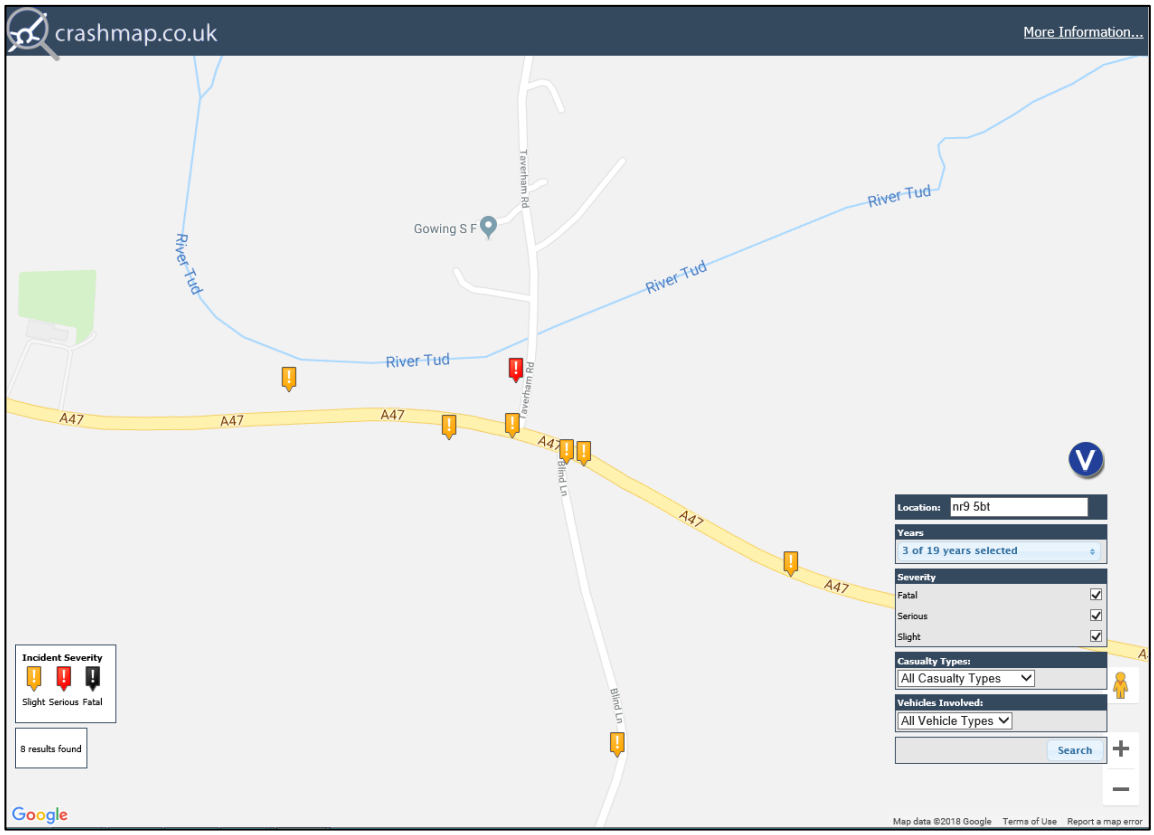

Figure 2.1 – Crashmap A47/Taverham Road Junction Assessment

4.25 The Crashmap data depicted in Figure 2.1 shows that only one accident occurred on the A47 immediately adjacent to the Taverham Road junction. This accident is classified as 'Slight' in severity and was recorded on the 15 January 2016 involving two vehicles resulting in one casualty.

4.26 Figure 2.1 also shows an accident recorded on Taverham Road approximately 35m north of the junction with the A47. This accident occurred on 26 July 2017 and is classified as 'Serious' in severity involving two vehicles and one casualty.

4.27 The next closest accident to the A47/Taverham Road junction was recorded on 4 May 2018, approximately 50m to the west on the A47. This incident was classified as 'Slight' in severity involving two vehicles and two casualties.

4.28 The two accidents shown to the east of Taverham Road along the A47 are more closely linked to the Blind Lane junction to the south and therefore are not relevant to this assessment.

4.29 In addition to the Crashmap data analysis outlined above, further analysis has been undertaken using collision data obtained from Norfolk County Council for an extended five year period to the end of August 2018, included at Appendix C. This more detailed account of collision data shows there to be no issues with HGV traffic turning to/from Taverham Road within the immediate vicinity of the A47/Taverham Road junction.

4.30 Consequently, it can be asserted that there are no prevailing accident issues associated with the A47/Taverham Road junction arrangement and this is likely to remain so with the introduction of Hornsea Three.

4.31 In view of the geometric, visibility and collision data analysis outlined above, there would appear to be no significant issues with use of the A47/Taverham Road junction in connection with Honsea Three and therefore, use of an alternative local route (i.e. via the A47/Church Lane roundabout at Easton) via Church Lane would not appear to be necessary, in this case.

A47 to west of Easton

4.32 Direct access from the A47 no longer proposed, therefore, no action is required.

A47 Easton Roundabout

4.33 Create will not be providing either a collision or a junction capacity assessment for this location due to the short time frame (between 106 and 158 days) over which the impact would take place.

A47/A1074 Longwater and A47/B1108 Colney Junctions

4.34 Paragraph 33 of BN01 states:

"The PEIR indicates that a number of HGV access routes will pass through, join and/or leave the A47 Trunk Road at the A1074 Longwater and B1108 Colney junctions (see PEIR Figure 7.1, sheet 7). AECOM recommend that, in the TA, if the traffic flow increases are sufficient to warrant it, the impact of the proposals on the capacity of these junctions should be assessed using an ARCADY model."

4.35 The AECOM response to this in BN01A is in two parts:

"No junction capacity models are included for these junctions.

As regards the A47/ A1074 Longwater junction, the TA appears to assign no construction traffic via the A1074 or via Dereham Road or Long Lane to the west and south of the junction respectively. The impact may therefore be minimal, comprising the proportion of the workforce who will find this the most convenient route from home addresses in Norwich to the construction sites to the west of the City. This type of trip does not appear to be quantified in the TA and, arguably, should have been."

4.36 As indicated on the accompanying traffic flows diagrams at Appendix D, the great majority of staff movements will not take place during the conventional AM (0800-0900hrs) and PM (1700-1800hrs) network peak periods and consequently, the impact will be minimal. The peak periods for staff movements associated with Hornsea Three would be 0700-0800hrs and 1800-1900hrs. Therefore, Create will not be providing any additional analysis at this location.

and;

As regards the A47/ B1108 junction, Appendix A of the TA implies an increase in flow of 31 light vehicle and 95 heavy vehicle two-way trips per day using the B1108 to access construction sites serving cable section 17. This scale of increase is unlikely to require either a collision or junction capacity assessment.

4.37 No collision or junction capacity assessment of the A47/ B1108 junction is to be provided.

A11 to the south-east of Hethersett

4.38 Create will not be providing either a collision or a junction capacity assessment due to the level of proposed traffic and the short time frame (163 days) over which the impact would take place.

A11/ A47 Thickthorn Junction

4.39 Create will not be providing either a collision or a junction capacity assessment due to the level of proposed traffic and the short time frame (between 163 and 231 days) over which the impact would take place.

A47 to the west of the Harford Junction

4.40 Create is in agreement with the AECOM statement within BN 01A, that the previously raised issue regarding the A47 to the west of the Harford Junction has now been resolved.

A47/ A140 Harford Junction

4.41 In line with the AECOM response Create will not be providing either a collision or a junction capacity assessment due to the time frame (up to 825 days) over which the impact would take place.

4.42 As indicated on the accompanying traffic flows diagrams at Appendix E, the great majority of staff movements will not take place during the conventional AM (0800-0900hrs) and PM (1700-1800hrs) network peak periods and consequently, the impact will be minimal. The peak periods for staff movements associated with Hornsea Three would be 0700-0800hrs and 1800-1900hrs.

4.43 Nevertheless, further analysis has been requested by AECOM for this junction with the response by Create outlined as follows, for the review period 0700-1000hrs.

4.44 The worst-case “Phase 4 max staff” development scenario for the construction would give rise to an estimated total of 57 additional movements towards the A140 northbound from the A47 eastbound off-slip and 81 additional movements from the A47 westbound off-slip, also bound for the A140 northbound during the AM peak period.

4.45 It should be noted, however, that this traffic would be managed such that it did not coincide with the conventional 0800-0900hrs network peak period and other measures such as car-sharing among staff would also be promoted by the Hornsea Three scheme to minimise its overall traffic impact on the local highway network.

4.46 The worst-case "Phase 4 max staff" scenario would give rise significantly fewer impacts at this junction in the PM peak period with a total of 30 additional movements towards the A140 southbound from the A47 eastbound off-slip and 3 additional movements from the A47 westbound off-slip, also bound for the A140 southbound.

4.47 HGV impact at this junction would be minimal amounting to less than 20 movements on the A47 eastbound and westbound slips in the PM peak period.

A47/ A146 Trowse and A47/ A1074 Postwick Junctions

4.48 Create is in agreement with the AECOM assessment the increases in traffic at these junctions associated with Hornsea Three as presented in the TA are not of the magnitude to warrant further collision or junction capacity assessment.

4.49 AECOM also state that collision or capacity assessments for the A1270 are also not necessary due to the temporary nature of the construction period with any single construction site active for up to 2.25 years. Create will therefore, not be undertaking any collision or junction capacity assessment.

Summary and Conclusions

4.50 This document comprehensively addresses those issues raised by AECOM on behalf of Highways England in BN01A dated 17th October 2018.

4.51 The additional information and clarifications provided herein mean that all points raised should now be satisfactorily addressed and there should be no further areas of concern for Highways England in respect of the Hornsea Three proposals.

Appendix B: Highways England BN02 and BN03

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;
- In 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.

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.

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). Collison 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.

Appendix C: Highways England BN04

Project:	**Highways England Spatial Planning Arrangement 2016-2020**	Job No:	**60572359 / DN055.003**
Subject:	**Hornsea Project Three Offshore Wind Farm – Mitigation Measures at the A47/ Taverham Road junction at Honingham**		
Prepared by:	**Andrew Cuthbert**	Date:	**27th February 2019**
Checked by:	**Mark Watson**	Date:	**5th March 2019**
Verified by:	**John Alderman**	Date:	**5th March 2019**
Approved by:	**Andrew Cuthbert**	Date:	**6th March 2019**

Introduction

1. AECOM have undertaken a technical review on behalf of Highways England of the Report entitled *'A47/ Taverham Road Highway Intervention Measures'* ('the Report') dated 22nd February 2019 and the Technical Note entitled '*Taverham Road Highway Intervention Measures Rev A*' ('the TN') dated 4th March 2019, both prepared by Create Consulting Engineers Ltd ('Create') on behalf of Orsted in support of the Hornsea Project Three Offshore Wind Farm ('the Wind Farm').

2. The Report and the TN together provide a response to issues raised by AECOM on behalf of Highways England and by Norfolk County Council (NCC). The issues raised by AECOM were documented in Briefing Notes BN02 and BN03 and these, together with NCC's concerns, were discussed at a meeting held on 25th January 2019.

3. The substance of these concerns was the suitability of the A47/ Taverham Road junction to provide access for heavy goods vehicles to work sites associated with the onshore cable route associated with the Wind Farm. Previous work (in the Transport Assessment) had estimated that up to 99 heavy goods vehicles per day could require access from the A47 via Taverham Road over a construction period of up to 436 days.

4. In BN02, AECOM identified that the existing junction does not comply with the design standards set out in DMRB TD42 for major minor junctions and that the minor arm is of a width such that the design vehicle could not enter it and stand clear of the A47 whilst a second vehicle emerged from the minor arm. In BN03, we identified a collision cluster/ pattern associated with vehicles turning into Taverham Road from the A47. The pattern was one of rear-end shunts involving vehicles waiting to turn right into Taverham Road being struck from the rear by westbound vehicles on the A47. The over-riding concern with the proposals was that works vehicles turning left or right into Taverham Road seeking access to the work sites would come to a stand within the main running carriageway of the A47 and increase the risk of the type of collisions already occurring at this location.

5. In response to these concerns, Create have procured additional traffic flow and collision data, produced an alternative layout for the junction, procured a Stage 1 Road Safety Audit and produced further updates to the proposed layout addressing the recommendations of their own and NCC's Audit Teams.

Key changes to the Layout

6. The layout proposed is shown on Drawing 1554/03/300. This was updated in response to BN02 and BN03 in advance of the meeting held on 25th January and has now been updated again. The

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current version is shown on Drawing 1554/03/300 Revision C. The key changes made are as follows:

- Taverham Road converted to left-in, left-out operation with right turns both in and out banned;
- Vehicles requiring to turn right into or out of Taverham Road directed to make U-turns at the Easton and Honingham roundabouts to the east and west, respectively;
- The right turn ban enforced by signs and road markings and by a triangular kerbed physical island in the mouth of Taverham road. However, there will not be a physical island along the centre line of the A47, which, if installed, would have led to concerns over the hazard created by such a physical obstruction;
- Blind Lane (the minor road opposite Taverham Road) temporarily closed to traffic with a physical barrier;
- Taverham Road locally widened for approximately 25m from its junction with the A47 to a width that would allow two HGVs to pass each other and to allow an HGV entering Taverham Road to stand clear of the carriageway of the A47 whilst it waits for an HGV in the opposite direction to emerge from the single lane section beyond;
- The corner radii between the A47 and Taverham Road increased to a radius of 15m, in accordance with DMRB design standard TD42 para 7.17 (b);
- A passing place within Taverham Road, located some 100m north of its junction with the A47, to allow two HGVs to pass each other;
- Indicative signage to enforce the right turn ban, closure of Blind Lane and to warn approaching drivers of the diversion required.

7. The changes proposed appear to address all of the issues identified by AECOM on behalf of Highways England, by Norfolk County Council, and by the Road Safety Audit team. It should result in a layout which minimises the risk of stationary traffic on the A47 resulting from vehicles waiting to turn into Taverham Road and should therefore be suitable to form the basis of an updated Statement of Common Ground.

8. Further detail follows in respect of specific issues and concerns.

Usage

9. Further data has been gathered on existing levels of traffic flow on Taverham Road and the increases which would result during the construction period of the Wind Farm.

10. Two sources of data are presented in the TN:
    - Link counts on Taverham Road undertaken over the period 22nd - 28th November 2018;
    - Turning movement counts at the A47/ Taverham Road junction carried out on 23rd January 2019.

11. The two datasets differ in the number of vehicles observed, as follows:
    - The link count contained in Table 2.1 of the Report records a peak hourly flow of around 9-10 vehicles and a daily flow of approximately 100 vehicles in each direction;
    - The turning movements contained in Appendix B of the TN indicate hourly flows of up to 36 vehicles in each direction: this would imply a daily flow of around 300 vehicles per direction per day.

12. The explanation given in the TN is that the turning movements count coincided with a harvest event, with an increased number of small agricultural vehicles recorded. The implication being that the link count represents the underlying regular level of traffic using Taverham Road.

13. Whichever source of data is used, it is clear that Taverham Road is currently very lightly used, with traffic flows of between 10 and 36 vehicles per hour in the peak direction in the peak hour and daily flows of between 200 and 600 vehicles (two-way) per day.

14. AECOM were unable to follow the exact derivation of all of the predicted flows shown in Table 3.2 of the Report, or of the calculated percentage increases. However, the out-turn numbers in the 'Standard Scenario' and in the 'Standard Scenario - HGV Reduction' broadly resemble those previously provided in submissions such as:
    - 'Appendix A - Transport Assessment Rev 2 - Sept 2018';
    - 'HOW03_6.6.7.1_TaT_Clarifications_Note';
    - 'Construction Vehicle Movements Calcs - Haul Road Depth - Dec 2018'

15. In this context, the impact of traffic during the construction stage of the Wind Farm represents a significant increase in the existing usage of Taverham Road, warranting an upgrade to its junction to the A47 on the scale proposed. However, the total numbers of vehicles (existing plus proposed) are still low and unlikely to have an adverse effect in terms of junction capacity and the decision by NCC and HE is not to require the production of a PICADY model of this junction.

Signage

16. The signage shown on Drawing 1554/03/300 Rev C is purely illustrative and the drawing explicitly states that it does not form a signage proposal. A comprehensive signage package will be required, in order to ensure that the right turn bans and diversions are clearly defined and that drivers approaching the Taverham Road and Blind Lane junctions, particularly on the A47, have adequate advance warning of the amended layout on the approach to the junction and guidance at the junction of the actions to take. For example, it might be necessary to provide a row of touching cones along the length of the tapers at the Blind Lane junction such that drivers cannot attempt to turn into Blind Lane and have no option but to continue ahead. The TN states that a detailed signage plan will be developed and agreed with NCC and HE. In addition, a Stage 2 Road Safety Audit will be required. This would consider the adequacy of the signage proposed. The need for detailed signage to be agreed in future can be agreed as appropriate at this stage.

Heavy Vehicle Swept Paths

17. The swept paths of the design HGV turning into and out of Taverham Road are shown on Drawing 1554/03/302 Rev A at Appendix E of the TN. The swept path plots show that the revised layout can accommodate the swept path of the design vehicle without encroaching on either kerb lines or lanes carrying opposing traffic and gives further confidence that a vehicle can enter Taverham Road from the A47 without slowing suddenly or excessively and will be able to stand clear of the A47 running lanes if it has to stop to let a vehicle pass in the opposite direction.

18. Appendix E illustrates swept paths for HGVs making U-turn movements at the Easton and Honingham roundabouts, which will result from the banned turns. The swept paths shown appear to indicate no issues of concern in respect of these roundabouts.

Personal Injury Accident Data

19. The TA contains details of an updated analysis of PIA data covering the period 1st September 2013 to 31st August 2018. This identified three collisions in the vicinity of the A47/ Taverham Road junction, all of which involved a right turn into or out of Taverham Road. AECOM's assessment, referred to in BN03 identifies a total of six collisions within 50m of the A47/ Taverham Road junction, of which four were rear end shunt collisions involving a vehicle turning right into Taverham Road being hit from the rear by a vehicle travelling east-to-west along the A47.

20. Notwithstanding the differing interpretations of the data, the Report accepts that there is an issue with right turns at the A47/ Taverham Road junction and, critically, the mitigation scheme now proposed would effectively deal with this problem and avoid potentially exacerbating it by the addition of Wind Farm construction traffic to this junction. This issue has therefore effectively been resolved by the adoption of the mitigation scheme shown on Drawing 1554/03/300 Rev B (now Rev C).

Road Safety Audit

21. A Stage 1 Road Safety Audit was commissioned by Create during February 2019 for the scheme shown on Drawing 1554/03/300 Rev A. The auditors identified two problems, both relating to signage. The designers' response acknowledges these problems and proposes appropriate remedial measures, which are incorporated in Drawing 1554/03/300 Rev B. This issue has therefore effectively been resolved by the adoption of the mitigation scheme shown on Drawing 1554/03/300 Rev B (now Rev C). A Stage 2 Road Safety Audit will be required once the detailed signage strategy has been produced.

Norfolk County Council Road Safety Comments

22. Following receipt of the Stage 1 Road Safety Audit, further comments were received from the road safety team at Norfolk County Council. These were set out in an email from John Shaw dated 26th February 2019. The only recommendation was that the triangular island proposed in the mouth of Taverham Road should be a physical feature (i.e. a kerbed island) rather than being defined by road markings. The response from Create accepts this point and the kerbed island is shown on Drawing 1554/03/300 Rev C. This should assist in making the right turn bans self-enforcing and increase the conspicuity of the junction for vehicles approaching from Taverham Road.

Future Reinstatement

23. Although the works are intended as temporary, in practice, some are likely to remain in place once the Wind Farm construction is complete. A permanent layout which would be retained after the Wind Farm works traffic has finished, i.e. a 'reinstated layout', should be defined and agreed in due course. This should be subject to at least the same scrutiny as the temporary layout, since it could have a significantly longer design life than the temporary scheme.

Conclusion

24. The updated mitigation scheme proposed at the A47/ Taverham Road junction, illustrated on Drawing 1554/093/300 Rev C, and which is the subject of the Report entitled *'A47/ Taverham Road Highway Intervention Measures'* dated 22nd February 2019 and the Technical Note entitled '*Taverham Road Highway Intervention Measures Rev A'* dated 4th March 2019 appears to have addressed all of the issues previously raised by Highways England and Norfolk County Council and could now be accepted as suitable to form the basis of an updated Statement of Common Ground setting out Highways England's agreement in principle to the mitigation measures proposed.