Project:	**Highways England Spatial Planning Arrangement 2016-2020**	Job No:	**60600479 / DF006.001**
Subject:	**Aquind Interconnector – SRTM Data Analysis & TA Scoping Note Review**		
Prepared by:	**Andrew Cuthbert**	Date:	**8th October 2019**
Checked by:	**Kelly Davis**	Date:	**10th October 2019**
Verified by:	**Liz Judson**	Date:	**11th October 2019**
Approved by:	**Andrew Cuthbert**	Date:	**14th October 2019**

Executive Summary

Following a review of the Solent Sub-Regional Transport Model (SRTM) Data Analysis Report, prepared by WSP in support of the proposed Aquind Interconnector on-shore works, AECOM recommend that the following information and analysis should be included in the Transport Assessment.

1. The A27/ A2030 grade separated junction should be included in the study area and the impact of the scheme at this junction should be examined. Alternatively, justification should be provided for its exclusion (para 2.13).
2. The existence or otherwise of a construction site access on the east side of the A2030, to the north of its junction with the A27 should be confirmed (para 1.10). If a site access is proposed here, further details should be provided as follows:
   - Its proposed layout, including HGV swept path analysis;
   - Its capacity tested using a PICADY model;
   - Confirmation that the risk of a queue back from this junction to the A27/ A2030 grade separated junction is minimal; and
   - If this is not the case, details of traffic management measures designed to minimise such queueing.
3. Details of the performance of the following junctions in each assessment scenario, extracted from the SRTM runs already undertaken (para 2.13):
   - A3/ A27 Portsbridge roundabout;
   - M27 Junction 12 grade separated junction;
   - M27 Junction 12 roundabout junction with A3 Southampton Road/ Western Road;
   - A3(M) Junction 4;
   - A3(M) Junction 5; and
   - The dumb-bell junction linking A3 (M) J5 with the A27 east towards Havant.
4. Further details of the performance of the following junctions, for each scenario, extracted from the SRTM runs already undertaken, to include arm-by-arm analysis (including circulatory stop lines on signal-controlled roundabouts) of capacity and queueing (para 2.12)
   - A3(M) Junction 2;
   - A3/ Dell Piece (west)/ Catherington Lane junction;
   - A3(M) Junction 3;
   - Hulbert Road/ Frendstaple Road/ Tempest Avenue junction;
   - A3 Southampton Road/ London Road/ Spur Road junction; and
   - B2177 Portsdown Hill/ Bedhampton Hill junction.

T +44 (0)1245 771200
www.aecom.com

Saxon House
27 Duke Street
Chelmsford, Essex
CM1 1HT

5. Where these SRTM results disclose a potentially severe impact, detailed junction capacity models using industry-standard software such as ARCADY or LinSig should be provided so as to examine in more detail the performance of the junction under the traffic flows predicted (para 2.14).
6. Clarification should be provided on the durations over which the impacts reported are likely to arise (para 2.6).

AECOM therefore advise Highways England to continue to work with WSP, Hampshire County Council, Portsmouth City Council and other stakeholders to resolve the issues identified, with a view to reaching an agreed position in advance of the forthcoming DCO Hearing.

1. Introduction

1.1. This Technical Note documents the results of a review carried out by AECOM, on behalf of Highways England, of a number of documents supplied by WSP on 12th September 2019 in relation to the potential impact on the transport network of the construction phase of the proposed Aquind Interconnector. These documents have been provided prior to the submission of a Development Consent Order (DCO) application.

1.2. The Aquind Interconnector is a proposed cross-channel electricity cable, which will make landfall at Southsea (Portsmouth) and access the National Grid at a converter station at Lovedean, to the north of Denmead. The cable will cross the A27 Trunk Road to the east of its junction with the A2030 Eastern Road.

1.3. AECOM understand that the engineering aspects of providing a cable crossing at this point are to be dealt with by Highways England's maintaining agent and that AECOM's input into the process will relate primarily to the traffic capacity and road safety implications of the wider project.

1.4. It is evident that this proposal is at a relatively early stage. The document currently under review is the second of a series of documents which are likely to come forward for review as part of the DCO application process. These can be summarised as:

- Preliminary Environmental Information Report (PEIR). Consultation was held on this document during March/ April 2019. Although this consultation has now closed, the PEIR will contain material we will find useful in understanding the potential impact of this proposal on the Strategic Road Network (SRN).
- The SRTM Data Analysis Report (SRTM DAR). This provides a summary of the output from a run of the Solent Area Sub-Regional Transport Model (the SRTM) and provides details of the potential impact of the proposals at a number of locations on and close to the SRN within the South Hampshire area.
- The SRTM DAR contains a copy of the draft Transport Assessment Scoping Note (TASN).

The SRTM DAR also refers to the following documents which are yet to be produced:

- The Transport Assessment (TA);
- The Environmental Impact Assessment (EIA) Transport & Traffic Chapter;
- The Traffic Management Strategy (TMS).

1.5. The purpose of this initial review is to identify potential impacts on the SRN and advise Highways England on the extent of technical analysis required to allow these impacts to be robustly quantified in the forthcoming TA and to identify any mitigation that might be necessary.

1.6. The SRN in this vicinity comprises the following:

- The M27 Motorway;
- The A27 Trunk Road; and
- The A3(M) north of its junction with the A27.

1.7. AECOM assume that the whole of the following form part of the Local Road Network (LRN), managed by either Hampshire County Council or Portsmouth City Council:

- The M275 Motorway; and
- The A3 throughout the study area.

1.8. As part of our initial review of the documents, AECOM identified the following locations that might be of interest and could possibly be of concern to Highways England:

- A3 (M) Junctions 2, 3, 4 and 5;
- The dumb-bell junction linking A3 (M) J5 with the A27 east towards Havant;
- The A3/ Dell Piece (west)/ Catherington Lane junction in Horndean (controlling access to the LRN from A3(M) J2);
- The Hulbert Road/ Frendstaple Road/ Tempest Avenue junction in Waterlooville (controlling access to the LRN from A3(M) J3);
- The B2177 Portsdown Hill Road/Bedhampton Road/ Maylands Road/ Bedhampton Hill roundabout at Bedhampton (controlling access to the LRN from A3 (M) J5);
- The A27/ A2030 Eastern Road grade-separated junction (NB this appears not to be included in the junctions so far identified for assessment in the SRTM DAR);
- The A3/ A27 Portsbridge grade-separated roundabout; and
- M27 Junction 12.

1.9. These locations are illustrated on the figure at Appendix B of the SRTM DAR, a copy of which is reproduced at Figure 1 on the following page.

1.10. Examination of this Figure shows what looks like a works site access located off the A2030 immediately to the north of its junction with the A27, which might have the potential to give rise to an impact at the A27/ A2030 junction itself.

1.11. A discussion of the key features of the SRTM DAR likely to be of interest to Highways England follows, together with some recommendations for further work.

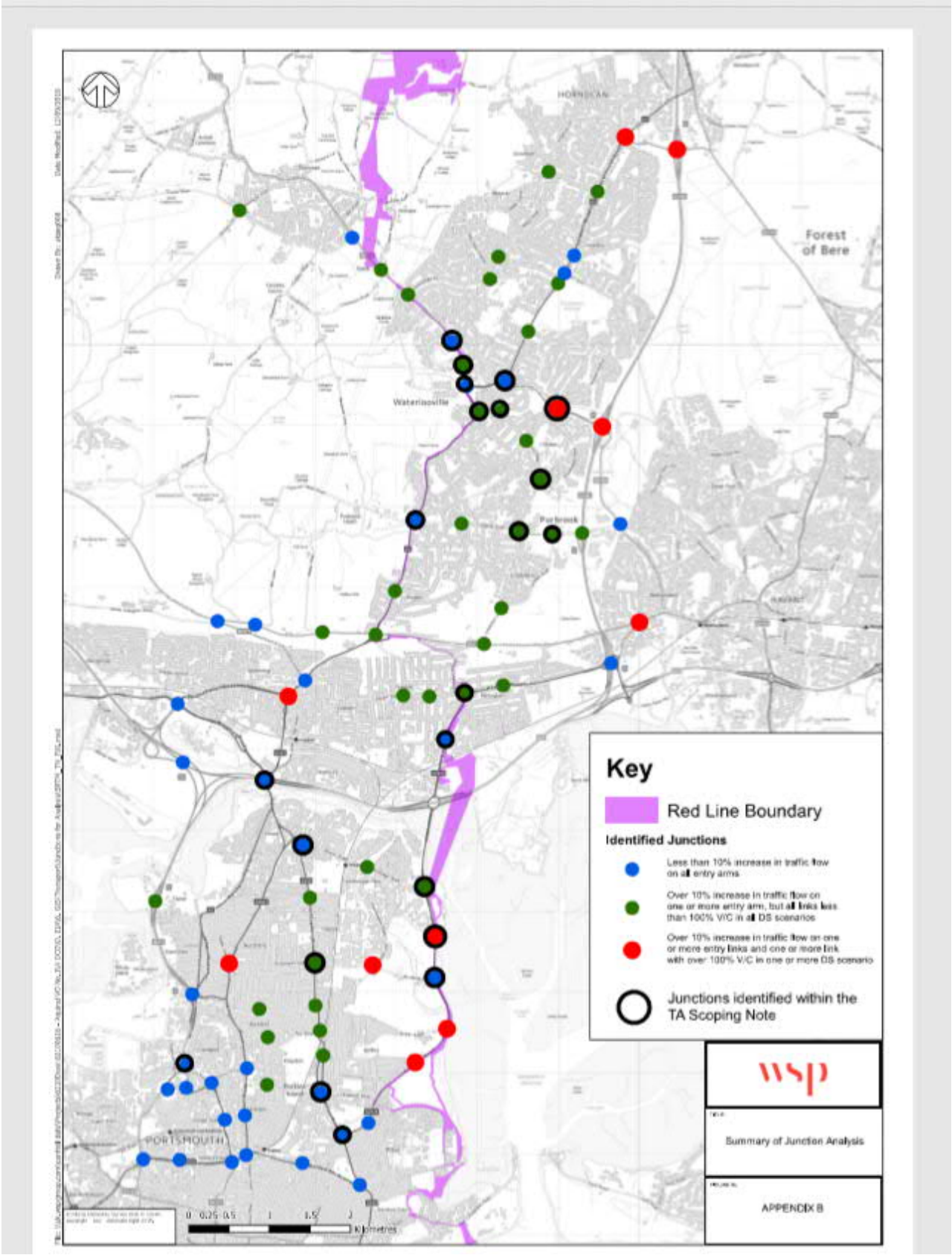

Figure 1: Junctions in the Study Area

(Source: SRTM DAR Appendix B)

2. The SRTM Data Analysis Report

2.1. The SRTM Data Analysis Report (the SRTM DAR) was produced in September 2019 and it follows on from (and includes as an appendix) the Draft Transport Assessment Scoping Note (TASN) dated June 2019. Both documents refer to the Preliminary Environmental information report (PEIR) which was issued in February 2019 as part of a Consultation exercise. AECOM were not involved in this study at that stage. Whilst the consultation on the PEIR is now closed, AECOM will use it as a source of data to assist in the further assessment of the proposed Interconnector. This current TN01, however, focuses on the SRTM DAR and the TASN.

2.2. The TASN contains an overview of a detailed assessment of construction traffic and construction workforce traffic generation assumptions. These assumptions are not tested here (but could be, if required, as part of a later stage of the work) but taken at face value for the purpose of this review. They can be summarised as follows:

- The converter station at Lovedean is assumed to generate:
  - 45 HGV two-way construction traffic movements per day;
  - 55 non-HGV two-way construction traffic movements per day;
  - 150 staff working on the converter station;
- The sites will operate between 07:00 and 19:00 Monday to Friday;
- Construction site traffic will be spread equally throughout the day, except for HGVs which will avoid the peak hours of 08:00 – 09:00 and 17:00 – 18:00.
- The workforce is assumed to arrive at 07:00 and 11:00 and leave at 15:00 and 19:00 and workforce shifts will be organised to avoid the peak hours.
- The trip distribution for the workforce is based on 2011 census journey-to-work data for a local MSOA and results in some 35% of workforce trips (and all HGV trips) assigning via A3(M) Junction 2.
- This results in a particular concentration of traffic at A3(M) Junction 2, with construction worker traffic predominantly using Dell Piece (west) to access the compound site amounting to 104 two-way trips per day.
- The cable route broadly follows the A2030 through Portsmouth and the A3 between Cosham and Waterlooville. Construction is assumed to take place over a series of 100m-long sections, up to six of which could be active at any one time. Each section would typically generate:
  - 4 HGV two-way construction traffic movements per day;
  - 2 non-HGV two-way construction traffic movements per day; and
  - 6-8 workers, which will travel to the site using Light Goods vehicles (LGVs) included in the totals above.
- These would be served from two construction compounds at locations yet to be confirmed in in the general vicinity of:
  - The Lovedean Converter Station; and
  - The Anchorage Park industrial estate.

2.3. It is evident from the SRTM DAR that this traffic has been assigned to the road network using the SRTM which has also been used to assess the impact of temporary reductions in traffic capacity resulting from traffic management measures (including some road closures) throughout the study area. The temporary traffic management measures are predicted to result in some re-assignment of existing traffic away from the cable corridor route whilst construction is taking place.

2.4. The SRTM DAR identifies 50 junctions in the study area for further investigation (from an initial long list of 85) and this includes 22 that had already been identified in the TASN. These were then filtered using the following significance thresholds:

- An increase in traffic flows of over 10% on any junction entry or circulatory arms;
- One or more junction entries with a V/C (RFC) greater than 100% in the assessment.

2.5. These are tabulated on pages 7 & 8 of the SRTM DAR and their locations are illustrated on Figure 1 of this TN.

2.6. The operation of the junctions has been assessed using the SRTM in an assessment year of 2026 in a number of scenarios. AECOM assume that this is the year in which peak construction activity will occur. No information is given in the SRTM DAR as to the duration of these effects, although this may be stated in the PEIR, which AECOM have not yet reviewed.

2.7. A detailed commentary on the operation of each junction, for which the SRTM DAR identified that a significant impact was likely, follows. The junctions identified are listed below and those which also have the potential to cause an impact on the SRN are identified by the use of bold text:

- **Hulbert Road/ Frendstaple Road/ Tempest Avenue roundabout**;
- A2030 Eastern Road/ Airport Service road junction;
- **A3/ Dell Piece (west)/ Catherington Lane**;
- **B2177 Portsdown Hill Road/ Bedhampton Hill junction;**
- **A3(M) Junction 2**;
- **A3(M) Junction 3**;
- **A3 Southampton Road/ London Road/ Spur Road**;
- A2030 Eastern Road/ Hayling Avenue;
- A2030 Eastern Road/ Tangier Road/
- Stubbington Avenue/ Angerstein Road; and
- Burrfields Road/ Dundas Lane.

2.8. These junctions are identified by the use of red circles on Figure 1 of this TN.

2.9. The SRTM DAR gives details of key traffic flow increases, some of which are significant (the highest being 197 additional vehicles in the peak hour).

2.10. The SRTM also contains a commentary of the impact of these traffic flow increases on the capacity of these junctions with V/C ratios (RFCs) quoted for selected junction approaches.

2.11. Unfortunately for this review, these results are not tabulated systematically, and no information is provided on predicted queue lengths. It is therefore not possible at this stage to comment on the potential for the flow and V/C increases reported to have a 'severe impact' on the SRN, such as would arise if any of the following were to occur:

- A queue on an A27 or A3(M) slip road tailing back to the main carriageway of the SRN bringing queueing traffic into close proximity with high speed traffic on the main line carriageway;
- A queue on the circulatory carriageway of a signal-controlled roundabout exceeding the capacity of the circulatory to accommodate it and blocking back across a preceding junction entry or exit;
- A queue from a junction on the LRN with the potential to tail back to an SRN junction.

2.12. However, there do appear to be a number of potential impacts reported which could affect the SRN either directly or indirectly. These include:

Table 1: Potential impacts on SRN Junctions derived from SRTM DAR

Junction	Approach	Traffic Flow increase	Time period	Potential to affect SRN
A3(M) Junction 2	A3(M) northbound off-slip	159 vehicles	PM peak	A3(M) northbound main carriageway
A3(M) Junction 3	Hulbert Road	72 vehicles	PM peak	Unclear
B2177 Portsdown Hill Rd/ Bedhampton Hill junction	B2177 Portsdown Hill Road	131 vehicles	AM peak	Unclear
A3/ London Rd/ Spur Rd roundabout	Spur Road	97 vehicles	PM peak	A27/ A3 Portsbridge roundabout
A3/ Dell Piece (west)/ Catherington Lane	Dell Piece (west)	99 vehicles	PM peak	A3 (M) Junction 2
Hulbert Rd/ Frendstaple Rd/ Tempest Ave roundabout	Frendstaple Road	197 vehicles	AM peak	Unclear

2.13. There are, however, a number of locations on or close to the SRN where the impact of the Aquind Interconnector is not discussed in the SRTM DAR. These include:

- A27/ A2030 grade separated junction;
- A3/ A27 Portsbridge roundabout;
- M27 Junction 12 grade separated junction;
- M27 Junction 12 roundabout junction with A3 Southampton Road/ Western Road;
- A3(M) Junction 4;
- A3(M) Junction 5; and
- The dumb-bell junction linking A3 (M) J5 with the A27 east towards Havant.

2.14. There is also a question over the ability of the SRTM to model, at a detailed (rather than a strategic) level, impacts of traffic flow increases and traffic management measures at individual junctions and it may be necessary to seek runs of detailed junction capacity models such as ARCADY or LinSig in order to fully quantify any potential severe impacts identified in the SRTM results..

3. Recommendations for further work

3.1. It is evident from the TASR (which forms an Appendix to the SRTM DAR) that further, more detailed work is to be undertaken in the preparation of the TA. This should be welcomed.

3.2. On the basis of the information available to date, and in order to ensure that all issues likely to be of interest to Highways England are covered, AECOM recommend that the following information and analysis should be included in the TA:

- The A27/ A2030 grade separated junction should be included in the study area and the impact of the scheme at this junction should be examined, alternatively justification should be provided for its exclusion.
- The existence or otherwise of a construction site access on the east side of the A2030, to the north of its junction with the A27 should be confirmed. If a site access is proposed here, further details should be provided as follows:
  - Its proposed layout, including HGV swept path analysis;
  - Its capacity tested using a PICADY model;
  - Confirmation that the risk of a queue back from this junction to the A27/ A2030 grade separated junction is minimal; and
  - If this is not the case, details of traffic management measures designed to minimise such queueing.

- Details of the performance of the following junctions in each assessment scenario, extracted from the SRTM runs already undertaken:
  - A3/ A27 Portsbridge roundabout;
  - M27 Junction 12 grade separated junction;
  - M27 Junction 12 roundabout junction with A3 Southampton Road/ Western Road;
  - A3(M) Junction 4;
  - A3(M) Junction 5; and
  - The dumb-bell junction linking A3 (M) J5 with the A27 east towards Havant.
- Further details of the performance of the following junctions, for each scenario, extracted from the SRTM runs already undertaken, to include arm-by-arm analysis (including circulatory stop lines on signal-controlled roundabouts, if any) of capacity and queueing:
  - A3(M) Junction 2;
  - A3/ Dell Piece (west)/ Catherington Lane junction;
  - A3(M) Junction 3;
  - Hulbert Road/ Frendstaple Road/ Tempest Avenue junction;
  - A3 Southampton Road/ London Road/ Spur Road junction; and
  - B2177 Portsdown Hill/ Bedhampton Hill junction.
- Where these SRTM results disclose a potentially severe impact, detailed junction capacity models using software such as ARCADY or LinSig should be provided so as to examine in more detail the performance of the junction under the traffic flows predicted.

3.3. Clarification should be provided on the durations over which the impacts reported are likely to arise.

4. Conclusion

4.1. In this TN, AECOM has reviewed and commented on the '*SRTM Data Analysis Report'* prepared by WSP in support of the proposed Aquind Interconnector and has identified some issues and concerns which should be addressed in the forthcoming Transport Assessment. AECOM's recommendations regarding these concerns are listed in the Executive Summary. AECOM have not taken a view at this stage as to which, if any, of these recommendations are regarded as 'Critical to the acceptability of the proposed development' since we consider that it will be desirable for the developer's consultant to address them all, and there will be the opportunity to do so as part of the work that will need to be done in the run up to the production of a Transport Assessment.

4.2. **AECOM therefore advise Highways England to continue to work with WSP, Hampshire County Council, Portsmouth City Council and other stakeholders to resolve the issues identified, with a view to reaching an agreed position in advance of the forthcoming DCO Hearing.**