INTERNATIONAL ADVANCED MANUFACTURING PARK - AREA ACTION PLAN

REVIEW OF TRANSPORT TECHNICAL BACKGROUND REPORT

FINAL DRAFT

MARCH 2017

WSP | PARSONS BRINCKERHOFF

1 INTRODUCTION

1.1 OVERVIEW OF THE TECHNICAL REVIEW

1.1.1 WSP | Parsons Brinckerhoff has been commissioned by Town End Farm Partnership Limited to conduct a technical review of transport documentation associated with the International Advanced Manufacturing Park (IAMP) Area Action Plan (AAP).

1.1.2 The findings of the review, which raise concerns in relation to the technical analysis that has been used to inform the approach and policies contained within the IAMP AAP, are presented within this note. Consideration is provided of the following documents:

- International Advanced Manufacturing Park Area Action Plan – Transport Technical Background Report **(PSD19)** *February 2017*
- Base Modelling Approach **(SD60)** *July 2015*
- Future Year Modelling **(SD61)** *July 2015*
- Multi-modal Trip Generation **(SD62)** *November 2015*
- Vehicle Trip Distribution **(SD63)** *November 2015*
- Local Model Validation Report **(SD64)** *December 2015*
- Washington Road Bridge Option Testing **(SD65)** *December 2015*
- Existing Network Trigger Point Assessment **(SD66)** *April 2016*

2 REVIEW OF TRANSPORT EVIDENCE

2.1 TRANSPORT TECHNICAL BACKGROUND REPORT (PSD19)

2.1.1 **PSD19** sets out evidence relating to transport matters and has been used to inform the approach to development of the IAMP AAP. It provides an overview of the proposals and sets out the approach adopted in traffic modelling exercises (with methodology established in supporting technical notes).

2.1.2 The report sets out that a micro-simulation model of the existing road network has been constructed and is informed by a comprehensive traffic data collection exercise which was undertaken on Wednesday 18th March 2015. National guidance in relation to the collection of traffic data is contained in WebTAG Unit M1.2 and states at Paragraph 3.3.6 that:

"Surveys should be carried out during a 'neutral', or representative, month avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. National experience is that the following Monday to Thursdays can be neutral:

- *late March and April – excluding the weeks before and after Easter;*
- *May - excluding the Thursday before and all of the week of each Bank Holiday;*
- *June;*

- *September – excluding school holidays or return to school weeks;*
- *all of October; and*
- *all of November – provided adequate lighting is available."*

2.1.3 Due to the timing of Easter (i.e. Friday 3rd to Monday 6th April) and the requirement to avoid one week durations either side of the school holiday period, late March did not technically form a neutral traffic month in 2015. It is considered that the decision to conduct such a wide ranging package of traffic surveys in the middle of March (i.e. a non-neutral traffic month) as appose to April (i.e. a neutral traffic month) may potentially have resulted in the collection of data, which is not representative of normal operational conditions on the highway network.

2.1.4 **PSD19** states that *"the scheduling of traffic surveys was discussed and agreed with Sunderland City Council, South Tyneside Council and Highways England, with all parties in agreement that traffic volumes and flows would reflect typical operations"*. No evidence is provided to indicate that subsequent checks were performed to ensure that this departure from standard was technically sound.

2.1.5 The report discusses the existing and future operational performance of the highway network (as informed by the micro-simulation model) and provides only a modest level of detail relating to queuing/congestion forecast during peak periods. No numerical data is provided, however, to support these claims or quantify the current operational performance of the network in terms of capacity.

2.1.6 The study assesses accessibility at the IAMP site and the potential for delivering sustainable development based upon existing infrastructure/recently recorded mode share statistics of employees based *"in and around the IAMP AAP area"*. The report concludes that sustainable modes of travel *"do not compare favourably with car journeys"* and that private motorised travel currently accounts for around 82% of existing journeys in the local area.

2.1.7 The report states that it will be important that the IAMP provides a permeable scheme for all modes of transport by providing additional links including a crossing to connect the site to residential areas east of the A19. Paragraph 5.4.2 states that:

"A new bridge over the A19 will be important for connecting the AAP area to land to the east. It will also however serve as an important link for the distribution of IAMP related traffic, providing an alternative route choice and avoid congested areas such as the A19 / A1290 Downhill Lane junction."

2.2 BASE MODELLING APPROACH (SD60)

2.2.1 **SD60** provides an overview of the micro-simulation model construction that is discussed in greater detail within **SD64**. It provides a bar chart which illustrates the peak hours on the traffic network and identifies 07:00-08:00 / 16:00-17:00 as the AM / PM peaks respectively.

2.2.2 The report states that the tested periods within the S-Paramics model are 07:00-10:00 and 15:00-18:00 (with the first and last 30 minute segments forming effective warm-up and cool-down periods). As will be discussed in greater detail later in this report, it is considered that this approach has the potential to impact upon the calibration and overall validity of the model.

2.3 FUTURE YEAR MODELLING (SD61)

2.3.1 **SD61** provides an overview of the methodology adopted in the forecasting and reporting of road network operations in future year scenarios. Section 2 of this documents states that:

"When considering the performance of the road network in future year scenarios, it is important that background traffic growth is included…Given the nature of the IAMP proposals, in that it represents a significant increase in employment in the area which is not included within the TEMPro assumptions, it is considered that the trips generated by IAMP will represent local traffic growth in its entirety, being equal or indeed greater than those that would be forecast by TEMPro. Consequently, all future years assessment scenarios will include IAMP generated traffic to represent background traffic growth."

2.3.2 Whilst it is acknowledged that the IAMP AAP will account for a significant level of employment development locally, it is considered that this approach has the potential to neglect the impact of other allocated residential and employment development sites, in addition to the wider Local Plan aspirations of the various Local Authorities between 2015-2028.

2.4 MULTI-MODAL TRIP GENERATION (SD62)

2.4.1 **SD62** provides an overview of the methodology adopted in the derivation of development traffic flows likely to be generated by the IAMP development. Section 3 states that the TRICS database has been utilised, in line with the principles of the TRICS Good Practice Guide 2013, to extract average trip rates representing B1 and B2 uses on the site, excluding sites located in town centres (which may not provide a representative sample, in light of the location of the IAMP site).

2.4.2 The report states that trip rates associated with B8 uses have not been extracted due to the lack of representative sites contained within the database. It must, therefore, be concluded that the TRICS database does not contain an appropriate sample of sites which are adequately representative of the global form of development proposed within the IAMP AAP. In light of this fact and the previously discussed low level of public transport accessibility, the use of average trip rates may underestimate the level of traffic likely to be generated by the IAMP site. Best practice, in circumstances such as this, would be to consider the use of 85th Percentile trip rates (as a minimum) to ensure that a robust assessment is achieved.

2.4.3 The report states that full TRICS outputs are appended to the rear of the document, however, no such information appears to have been released into the public domain and as such further scrutiny of the selected sites is not possible.

2.4.4 Given the nature of the proposed IAMP site (i.e. an extension to existing Nissan supply chain operations) it is considered that traffic surveys could have been conducted of representative units currently operating locally to inform the development of bespoke trip rates which would likely have been more representative than sites contained within the TRICS database.

2.4.5 Average total person trip rates have been extracted and mode-split data (recorded during a 2009 survey of Nissan employees) used to calculate the likely number of staff based vehicular trips which the IAMP site may generate, which is recorded at 75.5% of the total movements. As discussed previously, **PSD19** states that Sunderland City Council conducted a 2014 travel to work survey of employees working adjacent to the IAMP AAP which concluded that vehicle trips currently account for 82% of total movements in the area. It is not considered that the use of 2009 surveys (five years older than the 2014 data) which report lower reliance upon the private car, results in the presentation of robust technical analysis.

2.4.6 The study calculates the total number of staff based vehicular trips, however, it does not appear to consider the generation of commercial trips associated with operational aspects of the development. It is considered that the application of heavy goods vehicle movements to/from the IAMP site is critical in order to fully assess the traffic impact of the development proposals.

2.5 VEHICLE TRIP DISTRIBUTION (SD63)

2.5.1 **SD63** provides an overview of the methodology adopted to derive a gravity model associated with distribution of IAMP generated traffic onto the highway network. The study uses 2011 Census travel to work data to establish the origin/destination profile of employees likely to access the IAMP site. This method relies upon data, which will be 17 years old by the time development is complete and, therefore, is unlikely to result in a representative gravity model.

2.5.2 The study does not appear to have given consideration to the existing labour market or staffing arrangements at Nissan (including their adjacent supply chain). Details relating to the origin/destination profile of existing employees would have provided valid evidence, which would likely have been more representative than the use of data recorded during the 2011 Census.

2.5.3 The IAMP development is intended to allow companies forming part of the existing Nissan supply chain to relocate closer to the heart of manufacturing operations. No consideration appears to have been given to the strategic reassignment or removal existing trips from the network to reflect this fact, which may result in a bias towards traffic generation on one part of the network as appose to another.

2.6 LOCAL MODEL VALIDATION REPORT (SD64)

2.6.1 **SD64** provides an overview of the methodology adopted to validate the micro-simulation model, previously discussed within **SD60**. The modelling exercise was informed by traffic surveys conducted on Wednesday 18th March 2015. This technical note, however, states that the full package of results was not received from the survey company and that certain traffic flows were synthesised using alternative sources such as the TRADS database. Full details are not provided, however, it is considered that this may have had the potential to undermine the credibility of the baseline traffic data at certain intersections within the model.

2.6.2 It has been previously established that the peak hours on the traffic network were identified as 07:00-08:00 / 16:00-17:00 as the AM / PM peaks respectively This report states that the tested periods within the S-Paramics model are 07:00-10:00 and 15:00-18:00 (with the first and last 30 minute segments forming effective warm-up and cool-down periods). It is considered that constructing a micro-simulation model in which the warm-up period actually forms the initial 30 minutes of an identified network peak hour, has the potential to impact upon the calibration and overall validity of the model.

2.6.3 Section 5 of the report provides details of the model calibration exercise and establishes that guideline acceptability criteria contained within DMRB Volume 12 Section 2 Part 1 should be used to establish validity. Statistics presented within Tables 5.2 / 5.3, 5.8 / 5.9 and 5.10 / 5.11 demonstrate that turn flow, queue length and journey time calibration at the higher trafficked, major intersections within the model fail to meet minimum acceptability criteria by a significant margin during the critical network morning peak period of 07:00-08:00 and 15:00-16:00 (which coincides with the Nissan afternoon shift change and hence the localised peak period associated with intersections of strategic importance such as the A19/A1290 Downhill Lane).

2.6.4 Paragraph 5.36 attempts to justify the performance of the model by stating that *"the difference between modelled and observed journey time validation appears to be the result of variation in traffic between the survey day for the journey time and queue data."* It is noted, however, that paragraphs 2.13 and 2.14 state that both the journey time and queue length surveys were conducted simultaneously on Wednesday 18th March 2015.

2.6.5 Despite the apparent issues experienced in relation to validation of the micro-simulation model during critical network and localised peak periods of assessment, it does not appear that further calibration was conducted in order to achieve more refined levels of performance, prior to documenting traffic analysis which informs the conclusions drawn within **PSD19**.

2.7 WASHINGTON ROAD BRIDGE OPTION TESTING (SD65)

2.7.1 **SD65** provides an overview of micro-simulation modelling conducted to demonstrate the requirement for a new bridge over the A19, which it is stated will be necessary to *"serve as an important link for the distribution of IAMP related traffic."*

2.7.2 **SD62**, however, indicates that in the region of 4% of traffic generated by the IAMP is expected to use this route (which only equates to an average of approximately 1 vehicle per minute, even during the heaviest periods of traffic generation at the site).

2.7.3 Information relating to the hourly traffic flows anticipated to use the proposed new bridge are presented at Table 4.1 and appear to primarily constitute existing traffic movements on the wider highway network (travelling between Downhill Lane and Washington Road) which are assumed to reassign and use the IAMP site as a "rat-run" to avoid the A19/A1290 Downhill Lane junction. Whilst it is accepted that the proposal may result in an element of traffic reassignment if uncontrolled, it is not considered that the scheme will *"serve as an important link for the distribution of IAMP related traffic"* based upon the volume of trips presented in **SD65** and is, therefore, unlikely to be necessary to make the development acceptable in planning terms.

2.7.4 **PSD19** states that the operation and capacity benefits of the new bridge on the road network are demonstrated within the traffic modelling work, summarised in **SD65**, which considers a future year scenario (post IAMP) with/without the proposed bridge and identifies a significant difference in queue length at key junctions between the two scenarios. It is not considered, however, that either operation or capacity benefits are demonstrated within this technical note.

2.7.5 Once again, the note provides only a modest level of detail relating to the operational performance of the A19/A1290 Downhill Lane junction, with no numerical data presented to support the claims or quantify forecast levels of reserve capacity available with and without the provision of a new bridge link.

2.7.6 Only forecast queue lengths are tabulated, which do not provide an adequate indication of junction performance in isolation and should be related to corresponding relative degrees of saturation on each approach arm to provide operational context to the situation. Furthermore, it must be emphasised that concerns previously raised in relation to traffic data, growth assumptions, adopted trip rates, distribution of generated traffic and model validation all have the potential to impact upon the analysis presented within this technical note.

2.8 EXISTING NETWORK TRIGGER POINT ASSESSMENT (SD66)

2.8.1 **SD66** provides an assessment of the available capacity on the existing road network in the vicinity of the IAMP site. The study provides an interim assessment of the quantum of development that the local highway network can accommodate without the requirement for highway mitigation measures being implemented.

2.8.2 It documents the results of a 2018 sensitivity test using the micro-simulation model and principles established in previous technical notes. **SD66**, however, contradicts the approach to the application of no background traffic growth (established within **SD61)** and deems that Tempro adjusted NTEM growth factors are necessary (in addition to IAMP development traffic) to accurately simulate future conditions on the highway network. It must be considered that if this approach is required to forecast conditions in 2018, then it must also be necessary to forecast conditions in 2028 (for reasons previously discussed in this review).

2.8.3 These traffic flows are used to inform further micro-simulation modelling and, once again, it must be emphasised that concerns previously raised all have the potential to impact upon the analysis presented within **SD66**.

2.8.4 It is noted, however, that the S-Paramics model presented in **SD66** appears to have been updated to include a 30 minute warm-up and cool down period either side of the 07:00-10:00 and 15:00-18:00 assessment windows (which are documented as 06:30-10:30 and 14:30-18:30). Justification is not provided within the technical note, however, in light of concerns raised previously, it is considered that this may provide an indication that further calibration was considered desirable. If this is the case, then the same principle should have also been applied to the model used to inform the remainder of the study, with the main body of technical work being revisited to ensure more refined calibration of the baseline traffic position.

3 CONCLUSIONS

3.1 SUMMARY OF TECHNICAL REVIEW

3.1.1 This review concludes that the technical evidence which has been made publically available is not proportionate in relation to the scale of analysis which has informed the reporting contained within **PSD19**.

3.1.2 It is considered that the level of technical information contained within the documents reviewed is not sufficiently detailed enough to allow comprehensive consideration to be given to the full range of transport implications associated with delivery of the current IAMP AAP proposals.

3.1.3 Traffic flows anticipated to use the proposed new bridge, appear to primarily constitute existing movements on the wider highway network. It is not considered that the scheme will *"serve as an important link for the distribution of IAMP related traffic"* based upon the volume of trips forecast and is, therefore, unlikely to be necessary to make the development acceptable in planning terms.

3.1.4 It is also considered that in the absence of clarification regarding concerns raised in relation to traffic data, growth assumptions, adopted trip rates, distribution of generated traffic and model validation, these points have the potential to undermine the credibility of the technical analysis which has been used to inform the development of policies contained within the IAMP AAP.