Transport Note

Subject:	**International Advanced Manufacturing Park – Area Action Plan**
Topic:	**Matter 6: Infrastructure Transport and Access**
Item:	**Response to WSP|PB Review of Transport Technical Background Report**
Date:	**10/04/2017**

1. Purpose

1.1 WSP | Parsons Brinckerhoff (WSP|PB) has undertaken a technical review of transport documentation associated with the International Advanced Manufacturing Park (IAMP) Area Action Plan (AAP) on behalf of Town End Farm Partnership (TEFP). The contents of this review, undertaken and issued in March 2017, can be found in Examination Document EX6/06/04 'Town End Farm Partnership – Appendix 1 Highways Assessment'.

1.2 During the Examination in Public (EiP) Hearing on Matter 6, the Planning Inspector requested that the Councils provide a response to issues raised by the WSP|PB review and where appropriate, provide additional information. This Note considers each of the comments raised in turn, and similar to the WSP|PB review, is structured around the transport evidence within the Proposed Submission Documents (PSD) and Supporting Documents (SD).

1.3 This Note also takes the opportunity to provide additional information requested by Town End Farm Partnership (TEFP) during the Hearing with regard to the suitability of the location for the Washington Road Bridge over the A19 and alternative location options considered. This information is included within **Section 11**.

2. Transport Technical Background Report (PSD19)

Item raised by WSP|PB – Item 2.1 para 2.1.3

2.1 *"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 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 conditions on the highway network."*

Councils' Response

2.2 WebTAG is the Department for Transport's guidance on transport analysis. As outlined in WebTAG Unit M1.2 (para 3.3.6) surveys undertaken in late March, which exclude the weeks before and after Easter, are considered 'neutral'. In 2015, Easter Sunday was 5 April. The traffic surveys used to inform the model were undertaken in late March and prior to the week before Easter and as such, comply with the WebTAG guidance.

2.3 Furthermore, in discussion with Highways England (HE), Sunderland City Council (SCC) and South Tyneside Council (STC), surveys were conducted within an available window of opportunity when the likelihood of abnormal traffic behaviour associated with ongoing road improvement schemes in the region were minimal.

Item raised by WSP|PB – Item 2.1 para 2.1.4

2.4 "No evidence is provided to indicate that subsequent checks were performed to ensure that this departure from standard was technically sound."

Councils' Response

2.5 It has been shown above why there was no "departure from standard".

2.6 SCC maintains a number of continuous monitoring traffic counters across the city. **Appendix A** provides a comparison of traffic data for 2015, demonstrating that March is representative of a 'neutral' month. Also, included in **Appendix A** is a count data comparison note, which has been produced to confirm the suitability of the data.

2.7 Whilst some of the data used to inform the Paramics[1] model was collected in March 2015, other survey data, such as that outlined in Appendix A have been conducted between 2012-2017 to provide confidence that the March 2015 data was valid.

2.8 The data used to inform the Paramics model is considered to be sound.

Item raised by WSP|PB – Item 2.1 para 2.1.5

2.9 "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 performance of the network in terms of capacity."

Councils' Response

2.10 A micro-simulation Paramics model is an appropriate tool to inform AAP Policies for a development of this scale. Paramics allows the operation of the wider network to be assessed to understand the interaction between junctions and the consequence of re-evaluated route choices based on traffic conditions. Unlike macro traffic models however, a Paramics model does not produce numerical data relating to the capacity of junctions.

2.11 Data included within the Local Model Validation Report (SD64) provides data on existing operations. For example, Table 5.8 and Table 5.9 provide queue length results for 24 junctions within the network; Table 5.10 and Table 5.11 provide journey time results for 24 links on the network; and Table 6.1 and 6.2 provide traffic volumes at 22 different road links within the road network.

2.12 It is important to again highlight that the operation of the 'existing base' model in Paramics has also been reviewed by highway officers of Sunderland City Council, South Tyneside Council and Highways England. All parties confirmed that the model reflected their perception of existing typical operations and network conditions, including the location of queues forming, their length and their approximate time of occurrence.

[1] In the context of this document, the terms 'S-Paramics' and 'Paramics' are interchangeable.

3. Base Modelling Approach (SD60)

Item raised by WSP|PB - Item 2.2 para 2.2.2

3.1 *"The report states that the tested periods within the S-Paramics[2] 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 this approach has the potential to impact upon the calibration and overall validity of the model."*

Councils' Response

3.2 The Local Model Validation Report (SD64) confirms at para 5.1 that the calibration process of the Paramics model was carried out using the criteria specified in Design Manual for Road and Bridges (DMRB), Volume 12, Section 2, Part 1: Traffic Appraisal in Urban Areas.

3.3 Within the DMRB criteria, individual link flows or turn flows are the key considerations in determining the calibration of the model. DMRB Volume 12 recommends 85% of the turns should match the criteria for flows and suggests individual link or turn flows should have a GEH[3] of less than 5.0 in 85% of cases over a one hour period. A GEH of less than 5.0 is considered a good match between the modelled and observed hourly volumes.

3.4 As confirmed in Para 7.5 of SD64, an assessment of the turn flows against DMRBs criteria for flows indicates a high level of calibration with 94% of hourly turns in the AM and PM periods meeting the DMRB criteria. The model also calibrated well to the DMRB GEH criteria, with >85% of all modelled hourly turn counts, having a GEH value of less than 5.0 during the AM and PM periods.

3.5 As outlined in para 7.11 of SD64, the model calibrates well to the observed data and meets DMRB acceptability guidelines.

4. Future Year Modelling (SD61)

Item raised by WSP|PB – Item 2.3 para 2.3.2

4.1 *"Whilst it is acknowledged that the IAMP AAP will account for a significant level of employment development locally, it is considered that this approach [all future year assessment scenarios will include IAMP generated traffic to represented background traffic growth] 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."*.

Councils' Response

4.2 The approach to background traffic growth within the IAMP model is consistent with that adopted by the Highways England team assessing the A19 junction improvements (which each form separate Development Consent Order applications).

4.3 It is important to again emphasise that traffic growth and the way in which future traffic routes on the network will be notably influenced by the development of IAMP and the Highways England junction improvements for Testos and Downhill Lane.

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[2] In the context of this document, the terms 'S-Paramics' and 'Paramics' are interchangeable.

[3] The GEH (Geoffrey E. Havers) Statistic is a formula used in traffic modelling to compare two sets of traffic volume.

5. Multi-Modal Trip Generation (SD62)

Item raised by WSP|PB – Item 2.4 para 2.4.2

5.1 *"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."*

Councils' Response

5.2 The proportionate split between B2 (General Industrial) and B8 (Storage and Distribution) within IAMP will be determined by occupier requirements. As outlined in SD62 in para 3.4, the use of B2 uses for trip generation, rather than B8 is considered robust, given that the trip generation of B2 uses typically generate higher trip rates. Furthermore, B2 uses will likely be more akin to the anticipated end users of IAMP.

Item raised by WSP|PB – Item 2.4 para 2.4.3

5.3 *"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."*

Councils' Response

5.4 The appendices for SD62, which provide the full TRICS outputs, were made available prior to the EiP Hearing. This includes sensitivity testing of a wider range of industrial uses for comparison and confirms they are broadly comparable and suitable for the intended purposes.

Item raised by WSP|PB – Item 2.4 para 2.4.4

5.5 *"Given the nature of the proposed IAMP site (i.e. an extension to the 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."*

Councils' Response

5.6 It is not appropriate to use bespoke trip rates for IAMP, as the aspirations for IAMP are that it will offer a wide range of advanced manufacturing industrial uses which may not be directly linked to Nissan operations. It is therefore necessary to consider trip rates from other industrial uses from the TRICS database.

5.7 To ensure that the trip rates used to inform the AAP policies were appropriate, sensitivity testing of a wider range of industrial uses was undertaken and compared. This sensitivity testing is included within the appendix of SD62 and confirms they are broadly comparable.

5.8 The trip rates used to inform the traffic modelling work for the AAP are considered to be sound.

Item raised by WSP|PB – Item 2.4 para 2.4.5

5.9 *"Average total person trip rates have been extracted and mode-split data (recorded during 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 ….. It is not considered* *that the use of 2009 surveys (five years older than the 2014 [travel to work] data) which report lower reliance upon the private car, results in the presentation of robust technical analysis."*

Councils' Response

5.10 This interpretation is not correct. Whilst para 4.8 of SD62 outlines a 'person trips' methodology to determine IAMP vehicle trip generation and the suggested modal split percentages outlined above, this methodology was not taken forward for assessment. As outlined in para 5.1 and para 6.1 of SD62, 'vehicle trip rates' are determined and used within the assessments.

Item raised by WSP|PB – Item 2.4 para 2.4.6

5.11 "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 to fully assess the traffic impact of the development proposals."

Councils' Response

5.12 This interpretation is not correct. The trip generation calculations are not exclusively staff based trips. Whilst para 3.6 of SD62 presents a methodology based on total staff, as outlined in para 4.10 of SD62, trip generation is based on the gross floor area schedule. All vehicle types and trip purposes (such as commercial trips and heavy goods vehicles) are included within the traffic modelling and assessment.

6. Vehicle Trip Distribution (SD63)

Item raised by WSP|PB – Item 2.5 para 2.5.1 & para 2.5.2

6.1 "… 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."

6.2 "The study does not appear to give 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."

Councils' Response

6.3 SD63 outlines that the distribution of IAMP employees has been based on the findings of SD6 (Impact Study IAMP – Topic Paper: Skills) and SD12 (Impact Study IAMP – Topic Paper Update 2016: Skills), which considers the likely origin of the IAMP workforce throughout the region, including the local labour market. Census data has only been used to refine distribution assumptions in areas closer to IAMP where there is a greater variability of origin – the Ward areas of Washington and Sunderland (North, South, East and West).

6.4 The distribution assumptions used to inform the AAP are therefore considered to be sound.

Item raised by WSP|PB – Item 2.5 para 2.5.3

6.5 "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 [of] 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."*

Councils' Response

6.6 Firstly, as outlined previously, whilst some Nissan suppliers may locate to IAMP, the aspirations for IAMP are that it will offer a wide range of advanced manufacturing industrial uses, which may not be directly linked to Nissan operations.

6.7 The Paramics model uses a dynamic assignment for traffic on the road network, the future year modelling scenarios reflect strategic re-distribution changes resulting from changes to the road network (such as the Testos and Downhill Lane junctions).

6.8 Other strategic reassignment or removal of existing trips will be more applicable during the road network off peak periods when operations/deliveries will be more frequent. The traffic modelling focuses on the network performance during the road network peak periods, when congestion is more likely to occur as a result of employees arriving/departing.

7. Local Model Validation Report (SD63)

Item raised by WSP|PB – Item 2.6 para 2.6.1 – 2.6.5

7.1 "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."

7.2 "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 identifies network peak hour, has the potential to impact the calibration an overall validity of the model."

7.3 "… 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)."

7.4 "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."

Councils' Response

7.5 As outlined in the response to Item 2.1 and Item 2.2 - Para 7.11 of SD64 confirms that the model calibrates well to the observed data and meets DMRB acceptability guidelines.

7.6 Again, highway officers of Sunderland City Council, South Tyneside Council and Highways England have all confirmed that the model reflects their perception of existing typical operations and network conditions, including the location of queues forming, their length and their approximate time of occurrence.

8. Washington Road Bridge Option testing (SD65)

Item raised by WSP|PB – Item 2.7 para

8.1 "….. 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."

Councils' Response

8.2 Firstly, the Washington Road Bridge over the A19 is an important link for all forms of IAMP traffic, not just cars. The new bridge would provide a routing option for buses and will also play an important role for pedestrian traffic, equestrian users and cycle traffic; it links IAMP to the Sustrans cycle link on the eastern side of the A19 for example.

8.3 The data in **Appendix B** of this Note demonstrates that without the inclusion of the bridge, traffic queue lengths are excessive, with queues reaching approximately 350 metres in both the AM and PM periods on the A1290 Downhill Lane northbound approach to the A19 (compared to approximately 70 metres and 160 metres in the AM and PM periods respectively, with the bridge). Queue lengths without the bridge would block back to adjacent junctions and cause operational difficulties. Also, such instances give rise to road safety concern due to restricted manoeuvrability and increased driver frustration leading to reduced gap acceptance.

8.4 Within **Appendix B** is also the results of a sensitivity test, to consider the resilience of each network layout (with and without new bridge) to accommodate a combined IAMP and Nissan shift change-over peak. The results demonstrate that queues are significantly greater without the bridge, most notably at the A19 Downhill Lane junction.

8.5 In addition to demonstrating the queue length benefits of the new bridge over the A19, the results in **Appendix B** also demonstrate the reduction in traffic on the A1290 and faster average traffic speeds on the network with the inclusion of the bridge.

Item raised by WSP|PB – Item 2.7 para 2.7.5 & para 2.7.6

8.6 "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."

8.7 "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."

Councils' Response

8.8 A micro simulation model, such as Paramics, is the most appropriate modelling tool to assess the impact of IAMP on the wider road network. Paramics does not however provide levels of reserve capacity at junctions. Such information is derived from junction assessment packages which are typically included within a Transport Assessment, submitted at the stage of an application for development consent or planning permission.

8.9 For the avoidance of doubt, it is confirmed that the traffic modelling work being undertaken by Highways England for the A19 Testos and Downhill Lane junction includes the new IAMP bridge over the A19 in future year modelling scenarios.

9. Existing Network Trigger Point Assessment (SD66)

Item raised by WSP|PB – Item 2.8 para 2.8.1 & 2.8.2

9.1 "SD66 provides an assessment of the available capacity on the existing road network in the vicinity of the IAMP site …… 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 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)."

Councils' Response

9.2 It should be made clear that SD61 considers the resultant traffic impact from a full build-out of IAMP (in 2028), whereas the purpose of SD66 was to determine the level of IAMP related traffic capable of being accommodated on the existing road network, without improvement (in 2018).

9.3 The development of IAMP in full, will result in significant traffic growth locally and a redistribution of traffic movements on the network will also occur. The creation of over 5,000 jobs on the land to the north of Nissan will see a concentration in traffic growth in this area and it is therefore not appropriate to also include further Tempro[4] background traffic growth; an approach to modelling also adopted by Highways England in their assessments of the Testos and Downhill Lane junction improvements.

9.4 However, if a smaller proportion of IAMP were to be operational in 2018, this level of traffic generation would not be significant enough to represent traffic growth on the wider road network. It is therefore appropriate that Tempro background traffic growth is included within the assessment.

10. Conclusions

Comment raised by WSP|PB – Item 3.1 para 3.1.2 & 3.1.2

10.1 "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 implication associated with delivery of the current IAMP proposal."

[4] TEMPRO, is the Trip End Model Presentation Program software, designed to allow detailed analysis of pre-processed trip-end, journey mileage, car ownership and population/workforce planning data from the National Trip End Model (NTEM). TEMPRO is the industry standard tool for estimating traffic growth throughout Great Britain.

10.2 *"…. 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."*

Councils' Response

10.3 Whilst no new items are raised within this section, it is interesting to note the apparent contradiction in these conclusions. Despite the initial paragraph concluding that insufficient detail is provided to allow comprehensive consideration to be given on transport implications, the subsequent paragraph is clear in its opinion that the proposed new bridge is not necessary to make the development acceptable.

11. Location of Washington Road Bridge over A19

Item raised by Town End Farm Partnership

11.1 An alternative location for the bridge was previously considered to the south of the location currently proposed. Justification is sought to why this option was not pursued.

Councils' Response

11.2 Upon confirmation of the requirement for a bridge over the A19 in early 2015, suitable locations were considered.

11.3 The new bridge should be sufficiently wide enough to accommodate an upgrade of the A19 to three lanes in both directions. The bridge must be located along the eastern boundary of IAMP and sufficiently far south of the A19 Downhill Lane junction to not conflict with operations.

11.4 The drawings in **Appendix C** were produced during 2015 and 2016 as part of the initial construction feasibility process, when consideration was being given to the bridge being located along the alignment of Washington Road on the western side of the A19 and landing near the Ferryboat Lane Junction.

11.5 Several constraints to design and deliverability were identified for this location. The deliverability issues identified for this location were:

- The existing footbridge in this location is well used and the new bridge should allow the existing bridge to retain its use throughout construction. This results in implications on the alignment of any new vehicular bridge.
- A Gas Governor Housing unit is located at the Ferryboat lane / Washington Road junction which would need to be relocated to allow construction of the bridge in this location; a cost in the order of £250,000 would be associated with its relocation, along with considerable lead-in times.
- The residential bungalows fronting onto Washington Road and Ferryboat lane are at a lower level than the carriageway. Considerable visual impact would be experienced if the bridge was built in this location due to required retaining structures to tie in with existing road level.
- Horizontal and vertical re-alignment of Ferryboat Lane would be required, resulting in access difficulties to residential properties to be overcome within the design. A viable solution was not identified and any such solution would likely have significant environmental impacts for residents, such as noise, visual and air quality.

- Due to the alignment of the tie-in roads on either side of a bridge in this location and the limited space available, the design speed will require to be set as the minimum permissible to allow a suitable vertical bridge alignment to be achieved.
- Woodland would require removal if the bridge is to be in this area.

11.6 When the above constraints are considered collectively, this would result in significant cost and environmental impacts on the local area. For these reasons, the location of the bridge in a more northern location was pursued.

11.7 The detailed design of this bridge is currently being progressed as part of the DCO application and is being informed by continuous dialogue with Highways England and AutoLink, the DBFO operator for the A19 in this area.

APPENDIX A

Flow Data Comparison and Note

	A19 - South of Hylton Bridge (Sites 12301 & 12302)			
	24hr AADT			
		2015		
	Month	**North**	**South**	**2-Way**
	Jan	38539	35693	74232
	Feb	41869	38426	80295
	Mar	42218	38991	81209
	Apr	41036	39005	80041
	May	41052	39796	80848
	Jun	43245	41126	84371
	Jul	42431	39729	82160
	Aug	41817	-	-
	Sep	42265	40868	83133
	Oct	43308	41277	84585
	Nov	43978	41551	85529
	Dec	38172	36485	74657
	Average	**41661**	**39359**	**81005**

	A1290 S of DHL (Sites 520101 & 520102)			
	24hr AADT			
		2015		
	Month	**North**	**South**	**2-Way**
	Jan	3458	3422	6880
	Feb	3657	3762	7419
	Mar	4035	4138	8173
	Apr	3805	3530	7335
	May	3913	3606	7519
	Jun	4116	3826	7942
	Jul	4252	3948	8200
	Aug	3653	3387	7040
	Sep	4627	4041	8668
	Oct	4336	3970	8306
	Nov	4430	4025	8455
	Dec	4049	3765	7814
	Average	**4028**	**3785**	**7813**

	A195 Northumberland Way S of A194M (12701 & 12702)			
	24hr AADT			
		2015		
	Month	North	South	2-Way
	Jan	5029	4729	9758
	Feb	5320	4949	10269
	Mar	5409	5010	10419
	Apr	5076	4849	9925
	May	5072	4863	9935
	Jun	5316	5054	10370
	Jul	5189	4955	10144
	Aug	5027	4847	9874
	Sep	5390	5151	10541
	Oct	5839	5255	11094
	Nov	5488	5203	10691
	Dec	5542	5346	10888
	Average	**5308**	**5018**	**10326**

	A1231 East of A194M (51601 & 51602)			
	24hr AADT			
		2015		
	Month	West	East	2-Way
	Jan	12209	13177	25386
	Feb	13046	15378	28424
	Mar	13194	15682	28876
	Apr	13064	15165	28229
	May	13418	15562	28980
	Jun	13638	15759	29397
	Jul	13600	15781	29381
	Aug	13107	15181	28288
	Sep	13613	15611	29224
	Oct	13746	15686	29432
	Nov	13736	15912	29648
	Dec	13178	15028	28206
	Average	**13296**	**15327**	**28623**

IDENTIFICATION TABLE

Project	IAMP
Title of Document	A19 Traffic Survey Comparison
Type of Document	Info Note

1. TRAFFIC SURVEYS

1.1.1 The commissioned traffic survey programme for the model was scheduled for a traffic neutral day, i.e., out with school or local holidays, and covered all the major intersections in the study area.

1.1.2 Manual Classified Turning Counts were conducted on Wednesday 18 March 2015. The data was recorded in 15-minute count intervals, classified by vehicle type (Pedal Cycle, Motor Cycle, Car, LGV, OGV1, OGV2 and Bus) over a 12 hours period, including the AM and PM peak periods.

1.1.3 Further data was available as part of other commissions. A full list of this is noted in Table 1 below.

Table 1 -Recently commissioned surveys on A19

Reference	Location	Data Type	Date
9769-1	Entrance to TT	TRIS	2012-2017
9768-1	Entrance to TT	TRIS	2012-2017
4025	A185 E	BT/ATC	March 2015
4.36	Monkton Terrace/A185	JTC	
4.34	A185/Priory Rd	JTC	
4024	Priory Road	BT/ATC	March 2015
4.33	A185/ A19	JTC	
7002	A19 – Lindisfarne to A185	BT	
30361597	A19 – Lindisfarne to A185	TRIS	2012-2017
30361598	A19 – Lindisfarne to A185	TRIS	2012-2017
4.3	Lindisfarne	JTC	
4016	A194	BT/ATC	March 2015
4017	Leam Lane	BT/ATC	March 2015
4014	Hedworth Lane	BT/ATC	March 2015
4015	Hedworth Lane	BT/ATC	March 2015
3001	A19 Hedworth/Testos	BT	March 2015
9770-1	A19 Lindisfarne to Testos	TRIS	2012-2017
9771-1	A19 Lindisfarne to Testos	TRIS	2012-2017
22	Testos	JTC	March 2015
3021	A184	BT	March 2015
(8835)	A184	TRIS	2012-2017
7004	A19 below Testos	BT	March 2015
3002	Boldon business park	BT	March 2015

3003	A184 East of DH lane	BT	March 2015
24	A19 Downhill Lane	JTC	March 2015
7004	A19 below Testos	RADAR	March 2015
27	East of Downhill Lane	ATC	March 2015
28	East of Downhill Lane	ATC	March 2015
25	West of Downhill Lane	ATC	March 2015
9346-1	A19 Testos to Wessington Way	TRIS	2012-2017
9347-1	A19 Testos to Wessington Way	TRIS	2012-2017
30	A19/A1231	JTC	March 2015
3006	A19 Wessington Way to Chester Road	BT	March 2015
1.9	A19 Chester Road	JTC	March 2015

2. COMPARISON OF MCC VS. TRIS

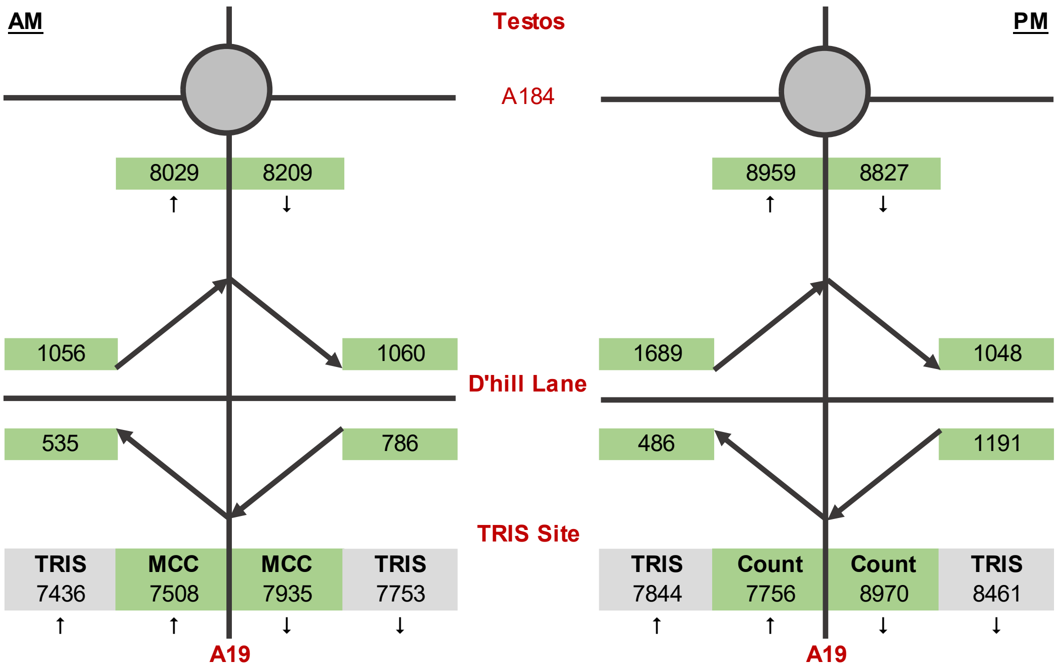
2.1.1 To demonstrate the commissioned survey program captured a day representative of usual traffic flows on the A19, it has been compared to TRIS data, for AM and PM 3h periods.

2.1.2 The TRIS counters chosen for comparison are located between Downhill Lane and the interchange between A19 and A1231. These are referenced as:

- TMU Site 9347-1 on link A19 northbound between A1231 and A1290 - GPS Ref - 434696 - 558327 - Northbound (8689) and,
- And TMU Site 9346-1 on link A19 southbound between A1290 and A1231 - GPS Ref - 434649 - 558743 - Southbound (8690).

2.1.3 This data was available for over one year and has been extensively processed to ensure neutral days are returned and any counter malfunctions are excluded.

2.1.4 The 3H AM and PM comparison of the TRIS and MCCs is noted below

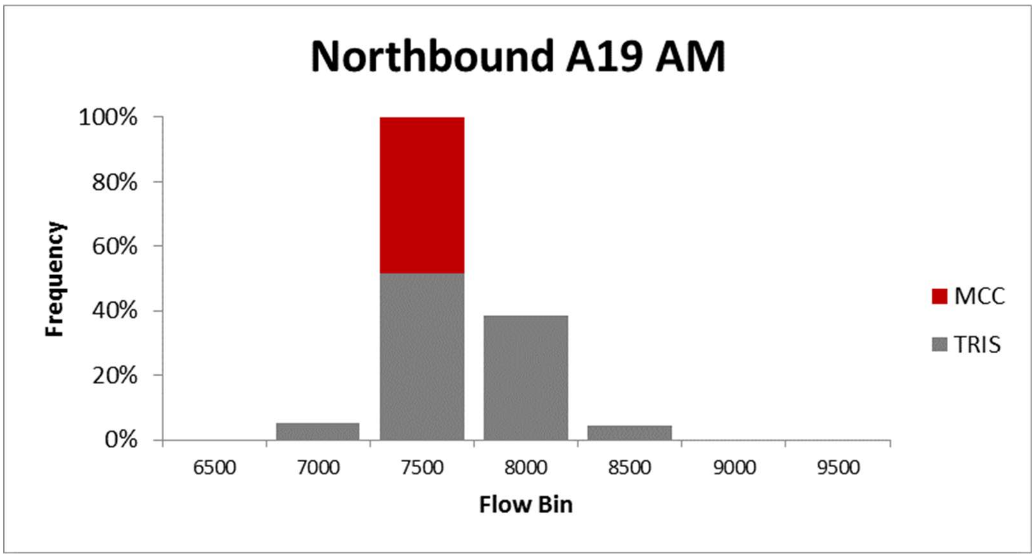


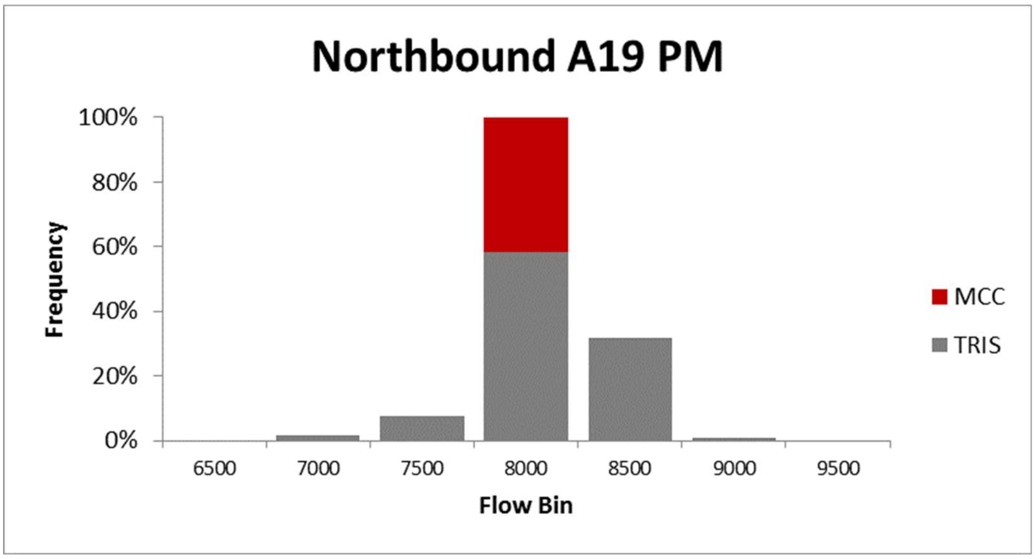
3. FURTHER COMPARISON OF MCC VS. TRIS

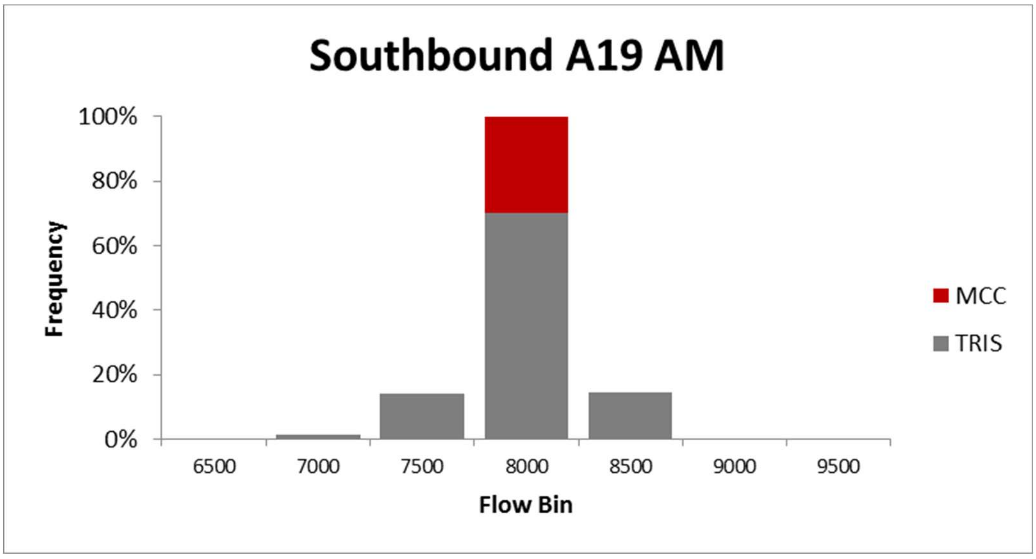
3.1.1 To ensure the commissioned survey program captured a day representative of usual traffic flows on the A19, it is further compared to the regularity of flow bins on the A19, by analysing typical flow patterns day to day.

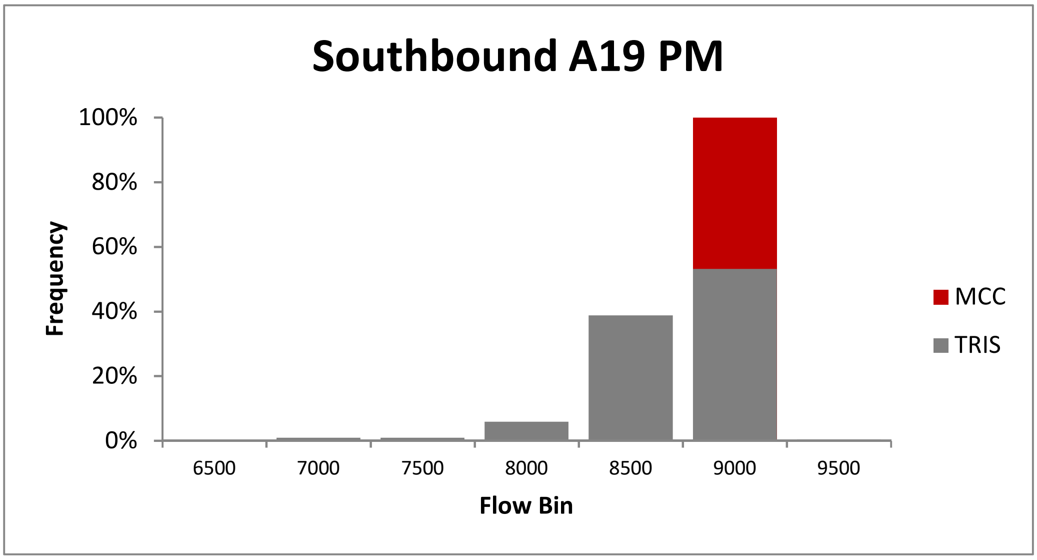
3.1.2 The northbound counter had a higher failure rate than the southbound counter. The results in the figures are presented on circa 120 days of data northbound, and circa 220 days southbound. The data was extracted from March 2015 – March 2016.

3.1.3 In the following Figures, the frequency of daily flows landing within each 500 vehicle bin is calculated as a percentage of the total number of usable days. These are presented in grey. The position of the MCC data is presented as the single bar in red.









3.1.4 As noted previously, that this data has been filtered to remove school holidays and any incomplete 3h totals (i.e. where the counter may have malfunctioned for one 15min segment. In addition, the data has been filtered to only include a quality rating (as set by the data provider (1-15)) of greater than 12.

3.1.5 The graphs show that whilst the Southbound PM MCC average flow was slightly higher than the average TRIS flow, it is actually more common for the higher ranging flows, though the spread of occasional lower flows pulls down the average, which suggests that the survey is consistent with the most representative day.

3.1.6 It is therefore concluded that the MCCs undertaken specifically for the IAMP project, are consistent with a typical, neutral, daily flow as should be normally expected on the A19, over the 2015-2016 period.

APPENDIX B

Additional Modelling Results

With & without Washington Road bridge testing

Bridge flows

	EB	WB	2-way
7-8	348	492	
8-9	266	276	
9-10	205	176	
3-4	433	239	
4-5	422	337	
5-6	355	192	
AM 3hr total	819	944	1763
PM 3hr total	1210	768	1978

Downhill Lane approach flows - with Bridge

	SB	WB	NB	EB	Total
7-8	707	308	444	835	2294
8-9	650	251	436	424	1762
9-10	429	180	283	490	1381
3-4	323	311	163	974	1771
4-5	444	322	257	1072	2095
5-6	344	251	75	1002	1672
AM 3hr total	1785	739	1163	1749	5437
PM 3hr total	1110	883	495	3048	5537

Downhill Lane approach flows - without Bridge

	SB	WB	NB	EB	Total
7-8	760	322	462	1122	2665
8-9	734	346	426	626	2131
9-10	492	343	299	643	1778
3-4	353	333	185	1329	2200
4-5	516	356	277	1328	2477
5-6	382	365	93	1356	2196
AM 3hr total	1986	1011	1186	2391	6574
PM 3hr total	1251	1054	555	4013	6873

Change in flows at Downhill Lane

	SB	WB	NB	EB	Total
7-8	-53	-14	-18	-286	-372
8-9	-84	-95	10	-201	-369
9-10	-63	-164	-16	-154	-396
3-4	-30	-22	-22	-355	-430
4-5	-72	-34	-20	-256	-382
5-6	-38	-114	-18	-354	-524
AM 3hr total	-200	-272	-23	-641	-1137
PM 3hr total	-141	-170	-60	-965	-1336

With & without Washington Road bridge testing

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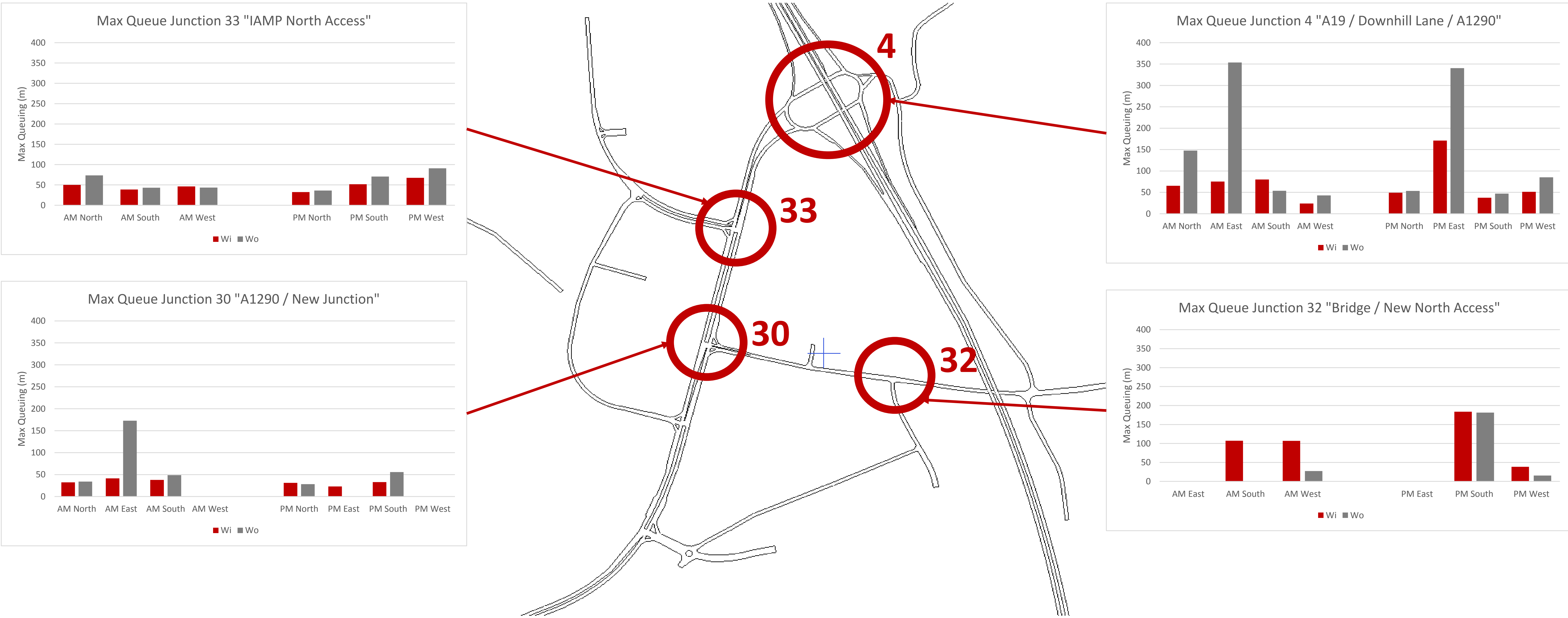


With & without Washington Road bridge testing

Network statistics

	Without Bridge			With Bridge			Change		
	Number of vehicles	Average distance travelled (km)	Average speed (mph)	Number of vehicles	Average distance travelled (km)	Average speed (mph)	Number of vehicles	Average distance travelled (km)	Average speed (mph)
AM	33220	4.26	29.7	33219	4.24	33.6	-1	-0.02	**3.9**
PM	32886	4.29	29.8	32914	4.27	33.1	28	-0.02	**3.3**

Conclusion: adding the bridge makes no significant difference to the number of vehicles, but reduces the average distance travelled by a small amount (20m per vehicle, a total of around 575km in the 3-hour AM period or 450km in the PM).
The main impact is that the bridge increases the average speed (for all vehicles, over the whole network) by 3-4mph.

Nissan Peak Sensitivity Test

Bridge flows

	EB	WB	2-way
7-8 (surge)	294	687	
8-9	267	250	
9-10	180	134	
3-4	214	168	
4-5 (surge)	637	443	
5-6	350	172	
AM 3hr total	740	1071	1811
PM 3hr total	1201	784	1985

Downhill Lane approach flows - with Bridge

	SB	WB	NB	EB	Total
7-8 (surge)	872	314	665	1193	3045
8-9	625	247	422	412	1707
9-10	412	162	264	446	1285
3-4	294	198	105	636	1232
4-5 (surge)	498	400	370	1661	2929
5-6	355	251	98	1011	1715
AM 3hr total	1910	723	1351	2052	6036
PM 3hr total	1147	849	573	3308	5877

Downhill Lane approach flows - without Bridge

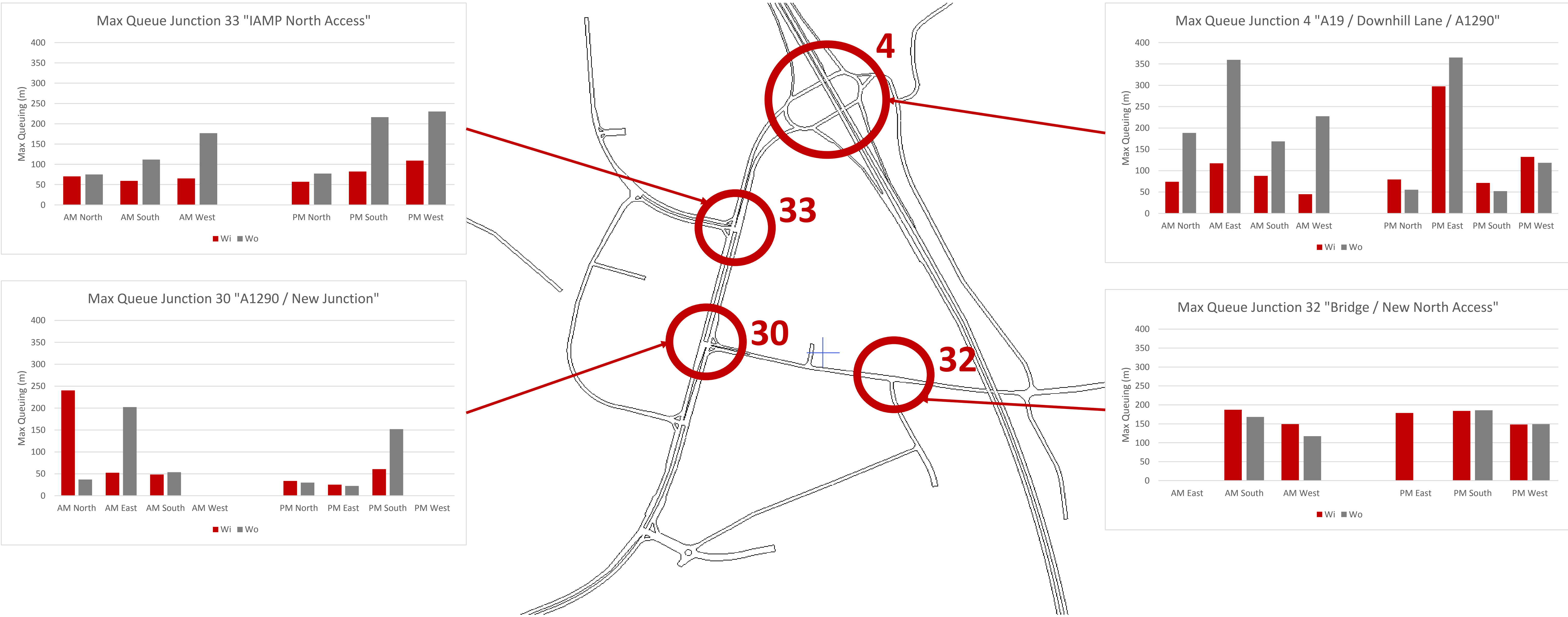
	SB	WB	NB	EB	Total
7-8 (surge)	791	311	648	1480	3230
8-9	790	334	443	582	2149
9-10	469	334	273	587	1664
3-4	315	317	121	794	1547
4-5 (surge)	557	346	390	1932	3225
5-6	378	336	115	1480	2308
AM 3hr total	2050	979	1364	2649	7043
PM 3hr total	1250	999	626	4206	7081

Change in flows at Downhill Lane

	SB	WB	NB	EB	Total
7-8 (surge)	81	3	17	-286	-185
8-9	-165	-87	-21	-170	-442
9-10	-57	-172	-9	-141	-379
3-4	-22	-119	-16	-158	-315
4-5 (surge)	-59	54	-20	-271	-296
5-6	-23	-84	-17	-469	-593
AM 3hr total	-141	-256	-13	-597	-1007
PM 3hr total	-104	-149	-53	-898	-1204

Nissan Peak Sensitivity Test

C:\Users\shill-smith\Documents\IAMP\Bridge testing - Nissan surge\[IAMP_Flows_Wi_Wo_Bridge_v2_surge.xlsm]summary



Nissan Peak Sensitivity Test

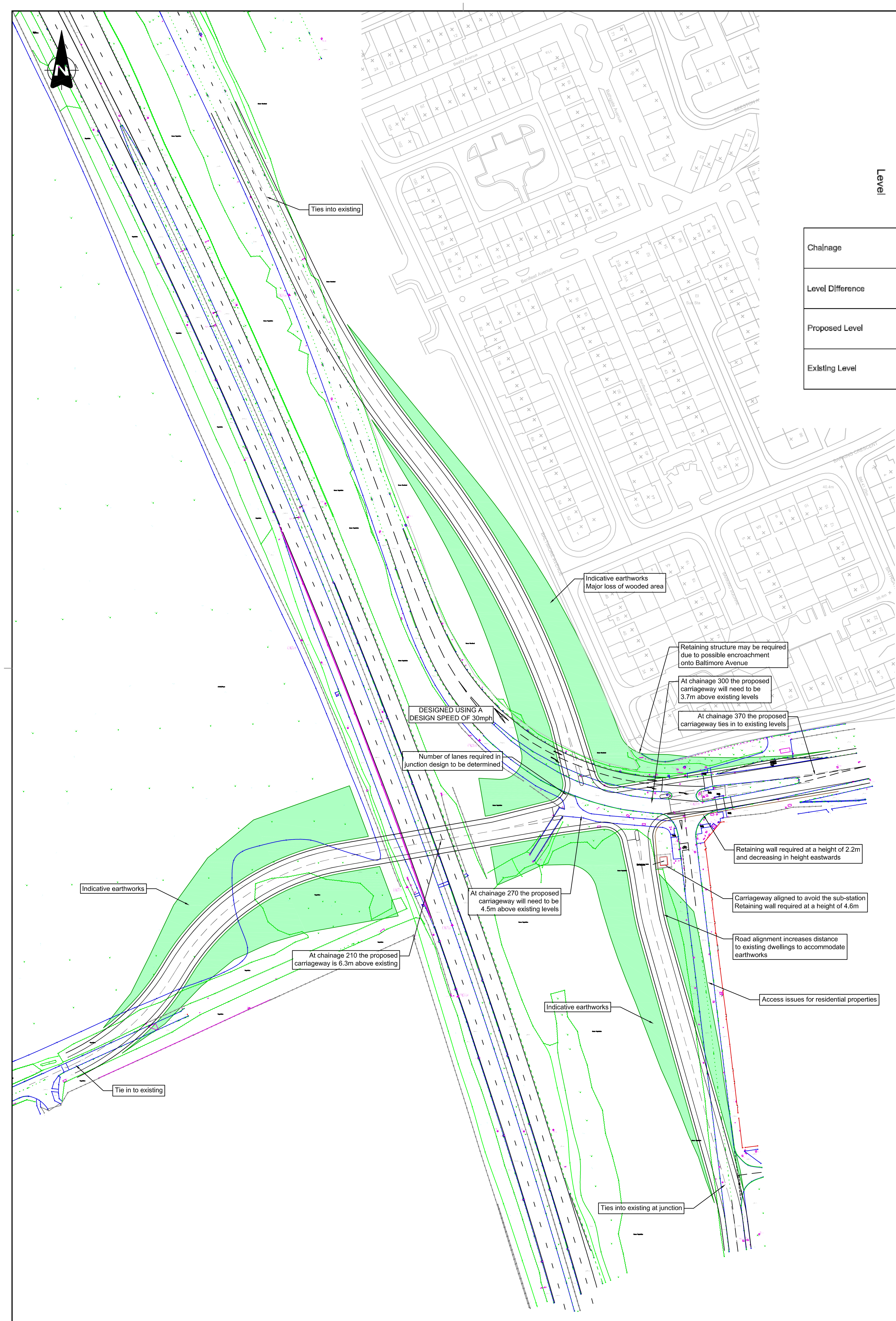
Network statistics

	Without Bridge			With Bridge			Change		
	Number of vehicles	Average distance travelled (km)	Average speed (mph)	Number of vehicles	Average distance travelled (km)	Average speed (mph)	Number of vehicles	Average distance travelled (km)	Average speed (mph)
AM	33611	4.27	23.8	33636	4.26	29.9	25	-0.02	**6.1**
PM	33084	4.30	26.6	33162	4.28	30.1	78	-0.02	**3.5**

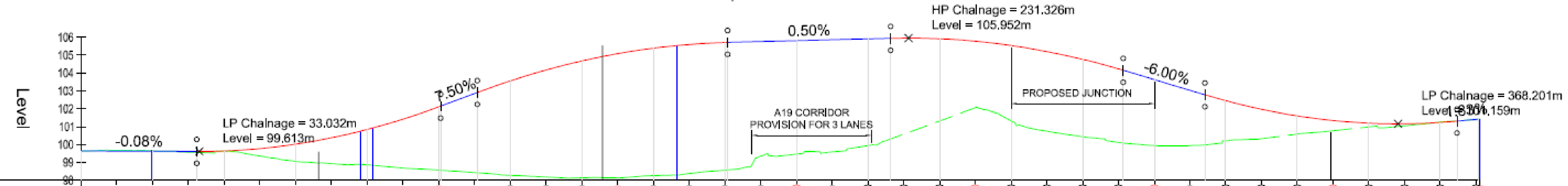
Conclusion: adding the bridge makes no significant difference to the number of vehicles, but reduces the average distance travelled by a small amount (20m per vehicle, a total of around 420km in the 3-hour AM period or 300km in the PM).
The main impact is that the bridge increases the average speed (for all vehicles, over the whole network) by 3-6mph.

APPENDIX C

Alternative Location Drawings for Washington Road Bridge

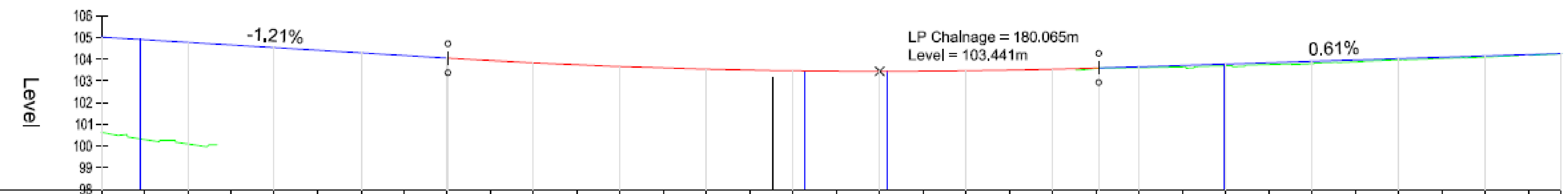


PROFILE VIEW WASHINGTON ROAD BRIDGE
SCALE: H 1:1000,V 1:200. DATUM: 98.000



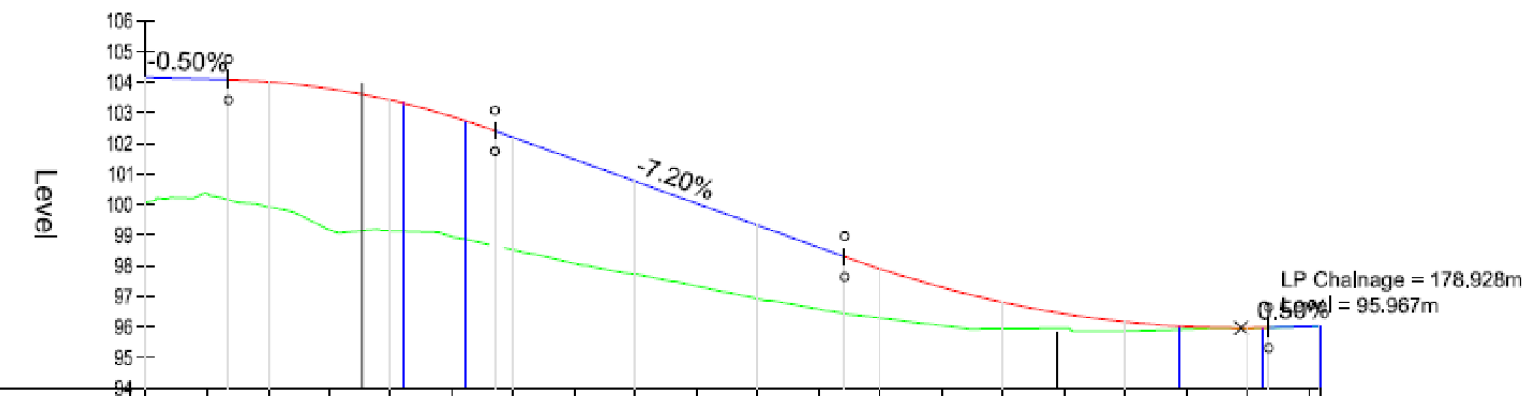
Chainage	Level Difference	Proposed Level	Existing Level
10.000	−0.045	99.631	99.676
20.000	−0.027	99.623	99.650
30.000	0.043	99.615	99.572
40.000	0.010	99.640	99.630
50.000	0.416	99.773	99.357
60.000	0.960	100.017	99.057
70.000	1.444	100.372	98.928
80.000	1.979	100.838	98.860
90.000	2.733	101.416	98.683
100.000	3.540	102.104	98.565
110.000	4.427	102.854	98.427
120.000	5.290	103.562	98.272
130.000	5.991	104.169	98.178
140.000	6.544	104.677	98.133
150.000	6.955	105.084	98.130
160.000	7.134	105.392	98.258
170.000	7.228	105.600	98.372
180.000	7.148	105.707	98.559
190.000	6.404	105.758	99.354
200.000	6.340	105.808	99.468
210.000	6.272	105.858	99.586
220.000	5.970	105.908	99.937
230.000	5.375	105.951	100.576
240.000	4.600	105.914	101.314
250.000	3.725	105.778	102.053
260.000	4.214	105.541	101.327
270.000	4.460	105.204	100.744
280.000	4.333	104.767	100.434
290.000	4.117	104.231	100.113
300.000	3.695	103.631	99.937
310.000	3.098	103.031	99.933
320.000	2.247	102.450	100.203
330.000	1.649	101.970	100.321
340.000	1.017	101.601	100.584
350.000	0.577	101.343	100.767
360.000	0.212	101.197	100.985
370.000	0.117	101.161	101.045
380.000	−0.013	101.237	101.250
390.000	0.002	101.408	101.406

PROFILE VIEW WASHINGTON RD
SCALE: H 1:1000,V 1:200. DATUM: 98.000



Chainage	Level Difference	Proposed Level	Existing Level
10.000	4.595	104.891	100.296
20.000	4.679	104.770	100.091
30.000		104.650	
40.000		104.529	
50.000		104.408	
60.000		104.287	
70.000		104.167	
80.000		104.046	
90.000		103.931	
100.000		103.828	
110.000		103.738	
120.000		103.659	
130.000		103.592	
140.000		103.538	
150.000		103.496	
160.000		103.465	
170.000		103.447	
180.000		103.441	
190.000		103.447	
200.000		103.465	
210.000		103.495	
220.000		103.537	
230.000	0.012	103.592	103.580
240.000	0.046	103.653	103.607
250.000	0.066	103.714	103.648
260.000	0.077	103.775	103.698
270.000	0.082	103.836	103.754
280.000	0.107	103.897	103.791
290.000	0.087	103.958	103.871
300.000	0.053	104.020	103.966
310.000	0.049	104.081	104.032
320.000	0.048	104.142	104.094
330.000	0.028	104.203	104.175

PROFILE VIEW FERRYBOAT LANE
SCALE: H 1:1000,V 1:200. DATUM: 94.000



Chainage	Level Difference	Proposed Level	Existing Level
10.000	3.743	104.100	100.357
20.000	4.094	104.018	99.924
30.000	4.617	103.792	99.175
40.000	4.275	103.411	99.137
50.000	3.922	102.877	98.955
60.000	3.680	102.196	98.516
70.000	3.404	101.476	98.072
80.000	3.030	100.757	97.726
90.000	2.703	100.037	97.334
100.000	2.391	99.317	96.926
110.000	2.018	98.597	96.579
120.000	1.603	97.896	96.293
130.000	1.246	97.297	96.051
140.000	0.868	96.809	95.941
150.000	0.473	96.432	95.959
160.000	0.301	96.166	95.866
170.000	0.083	96.011	95.928
180.000	0.014	95.968	95.954
190.000	0.000	96.011	96.011

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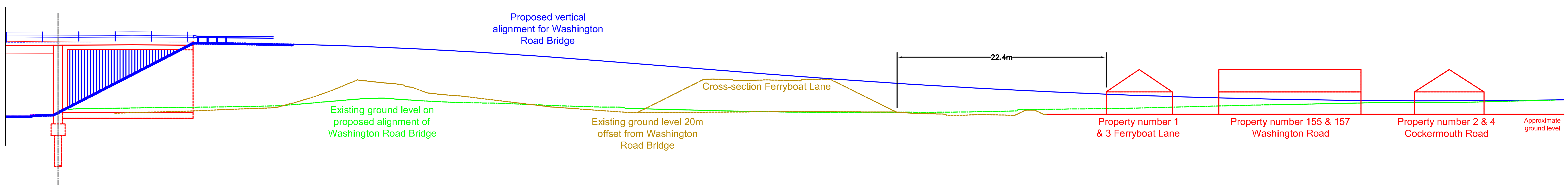
SUNDERLAND CITY COUNCIL

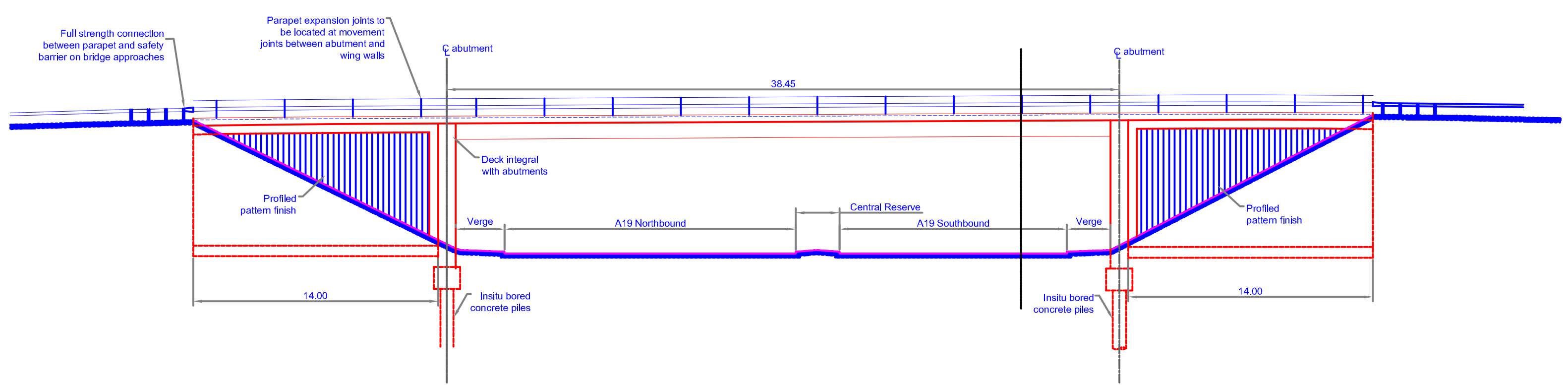
IAMP

WASHINGTON ROAD BRIDGE
CONCEPTUAL DESIGN

RAB	KR	KR
A1	29/04/2015	1:500
DRAFT	NEA1301-WRB-001	B



ELEVATION OF THE EAST SIDE OF WASHINGTON ROAD BRIDGE



SOUTH ELEVATION WASHINGTON ROAD BRIDGE

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Client	SUNDERLAND CITY COUNCIL	
Project	IAMP	
Title	WASHINGTON ROAD BRIDGE CONCEPTUAL DESIGN ELEVATION	
Drawn: RAB	Checked: KR	Approved: KR
Original dwg size: A3	Date: 19/02/2016	Scale: NTS
Drawing Status: DRAFT	Drawing Number: NEA1301-WRB-003E	Rev