

NTC Local Plan

Transport Impacts Report Addendum
September 2016

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1. Introduction

1.1 Highways England Further Work

Further to the merge/diverge assessment undertaken as part of the Transport Impacts Report prepared in May 2016 North Tyneside Council (NTC) have carried out further analysis on the impacts upon the Strategic Road Network (SRN).

NTC have used their existing Strategic Traffic Model to estimate the scale of the cumulative impacts of the Local Plan proposals upon the SRN. This assessment looks in further detail at which proposed development sites have a significant impact upon the SRN and provide an estimate as to when mitigations would be necessary.

The outcomes of this assessment have been discussed with Highways England (HE) and the conclusions have fed into the Memorandum of Understanding (MoU) prepared between NTC and HE over how the impacts upon the SRN are managed.

2. Assessment Methodology

2.1 Strategic Modelling

Following the initial outcomes identified from the Transport Impacts Report a further more detailed analysis of the impacts upon the SRN was undertaken. The initial assessment was a merge/diverge assessment which compares predicated mainline and slip road flows using the DMRB manual (V2 S2 P1 - TD 22/06). The outcome of this assessment was that several slip road arrangements were predicted to need upgrading to lane gain/lane loss arrangements. This was also the conclusion of HE whom recommended the A19 was widened between the Killingworth interchange and Silverlink Interchange.

NTC carried out multiple select link analyses of each of the slip roads and mainline A19 sections between Killingworth and Silverlink to ascertain which developments were contributing to these impacts and how many trips this represented. This allowed NTC to aggregate the impacts of all residential and employment sites identified in the Plan predicted to put pressure on the SRN.

NTC have a reasonable understanding of when each development is likely to come forward through the planning process as discussions with developers are ongoing following the completion of the SHLAA (Strategic Housing Land Availability Assessment). This allows NTC to work with HE to advise/estimate when mitigations to the SRN would become necessary.

In addition to the merge/diverge assessment NTC provided an indicative capacity assessment of each slip road and section of the A19 mainline based on indicative highway capacity thresholds has been undertaken. This assessment considered that the A19 mainline with two lanes has a maximum capacity of 3,600 vehs/hr and that each on-slip and off-slip has a capacity of 1,400 vehs/hr. These values have been taken from the DMRB merge/diverge charts as a rough estimate. In practical terms the capacity of an off-slip is also linked to the capacity of the junction at the end of the slip road, as any queueing may impact upon the mainline SRN.

NTC have already identified additional necessary mitigation works on local highway network junctions at the bottom of the A19 off-slips. Specifically these are on the A19 NB and A19 SB off-slips at the Holystone Interchange, as well as at the Killingworth Interchange A19 NB and SB off-slips. Furthermore the works are proposed to commence at the A19 Holystone Interchange in October 2016 with completion in early 2018.

2.2 Local Plan Site Impacts

As discussed above the impacts upon the SRN were disaggregated down to the individual development plots that represented both the trip origins and trip destinations. During the AM peak outbound residential trips and inbound employment trips represented the greatest cumulative impacts upon the SRN. Using the Saturn model it was possible to remove the double counting of these cumulative impacts as both the origin and destination zones were known. During the PM peak this process was reversed. The worst case cumulative impacts of additional trips occurred during the AM peak analysis.

The assessment was further broken down to each of the Local Plan Phases which were:-

Phase 0 – 2014 to 2017

Interim period representing traffic growth associated with already consented and partly constructed developments across the borough as well as the delivery of major infrastructure improvements programmed for delivery by 2018.

Phase 1 – 2018 to 2022

Initial 5 year delivery period of the Local Plan with completion of already consented developments as well as the first phase of the Killingworth Moor site.

Phase 2– 2023 to 2027

Second 5 year delivery period of the Local Plan with completion of the second phase of the Killingworth Moor site.

Phase 3– 2028 to 2032

Final 5 year delivery period of the Local Plan with completion of the third phase of the Killingworth Moor site

2.3 A19 SRN Capacity Analysis

The summary table below provides an estimate of the AM peak operational capacity on each slip road and mainline section of the A19 between Killingworth and Silverlink for each phase in the plan period.

Those links operating above 85% capacity are recommended to be considered for mitigation as the spare capacity is limited and operation is likely to create queues and disrupt the operation of the mainline A19.

Table 2.1 – AM Peak A19 SRN Capacity

Link	2013 (Base Year)	2018 (Phase 0)	2022 (Phase 1)	2027 (Phase 2)	2032 (Phase 3)
A19 Killingworth Interchange SB on-slip	64%	75%	79%	83%	88%
A19 Killingworth Interchange NB off-slip	33%	43%	49%	54%	60%
A19 NB Mainline Holystone - Killingworth	59%	73%	77%	82%	87%
A19 SB Mainline Killingworth - Holystone	93%	103%	105%	107%	109%
A19 Holystone Interchange SB off-slip	83%	70%	76%	82%	89%
A19 Holystone Interchange NB on-slip	46%	49%	56%	63%	70%
A19 Holystone Interchange SB on-slip	36%	99%	103%	108%	112%
A19 Holystone Interchange NB off-slip	40%	60%	60%	60%	60%
A19 SB Mainline Holystone - Silverlink	74%	114%	115%	117%	118%
A19 NB Mainline Silverlink - Holystone	57%	77%	79%	81%	83%

The results predict that all slip roads with the exception of the NB on-slip at Holystone will require improvements. Of particular concern is the SB on-slip at Holystone which is estimated to

significantly increase in demand between 2013 and 2032. The A19 mainline SB between Killingworth and Silverlink is also identified as significantly exceeding current capacity.

The summary table below provides an estimate of the PM peak operational capacity on each slip road and mainline section of the A19 between Killingworth and Silverlink for each phase in the plan period.

Table 2.2 – PM Peak A19 SRN Capacity

Link	2013 (Base Year)	2018 (Phase 0)	2022 (Phase 1)	2027 (Phase 2)	2032 (Phase 3)
A19 Killingworth Interchange SB on-slip	48%	54%	58%	62%	66%
A19 Killingworth Interchange NB off-slip	65%	68%	74%	80%	86%
A19 NB Mainline Holystone - Killingworth	72%	80%	84%	88%	93%
A19 SB Mainline Killingworth - Holystone	58%	67%	70%	73%	76%
A19 Holystone Interchange SB off-slip	51%	53%	57%	60%	64%
A19 Holystone Interchange NB on-slip	68%	58%	65%	71%	77%
A19 Holystone Interchange SB on-slip	34%	70%	73%	77%	81%
A19 Holystone Interchange NB off-slip	62%	79%	83%	87%	91%
A19 SB Mainline Holystone - Silverlink	52%	77%	80%	82%	84%
A19 NB Mainline Silverlink - Holystone	70%	88%	91%	95%	98%

The summary table highlights that the impacts in the PM peak are generally to a smaller scale than those in the AM. However the NB Mainline between Silverlink and Killingworth requires mitigation, unsurprisingly this is the reverse of the AM impacts. The A19 NB off-slips at Holystone and Killingworth are also of concern however these impacts may be managed in the short term due to the already identified mitigation scheme at both junctions.

The off-slips at Holystone are due to be widened to provide 3 lanes which will substantially reduce the risk of queuing back onto the Mainline A19 at these locations. The NB off-slip at Killingworth is proposed to be upgraded such that the majority of traffic leaving the SRN will no longer need to give-way at the bottom of the slip road. Westbound traffic will be provided with a lane-gain arrangement on the A1056 Killingworth Way whilst eastbound traffic will be provided with signal control to allow them priority as necessary and reduce the queue lengths on the off-slip.

A plan illustrating the locations along the SRN where works are required is included in Appendix A. The links are coloured according to the scale of the impact upon them with those highlighted in red operating above design capacity and those in orange approaching capacity. Those links represented with dashed lines are already subject to highway improvements. The detailed outputs of the capacity assessment for each slip-road and mainline link on the A19 SRN between Killingworth and Silverlink are also summarised in Appendix A.

Table 2.3 below provides NTC’s estimate of traffic growth on the A19 Mainline and slip-roads between Killingworth and Silverlink. The figures highlight that the slip-roads with low base flows experience a significant level of growth bringing them in line with the busiest slip-roads along this section of the A19 SRN.

Table 2.3 – Predicted traffic growth on SRN

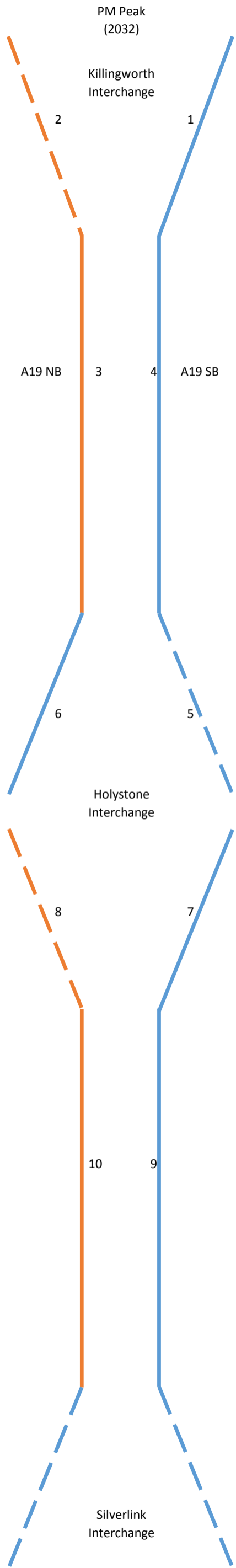
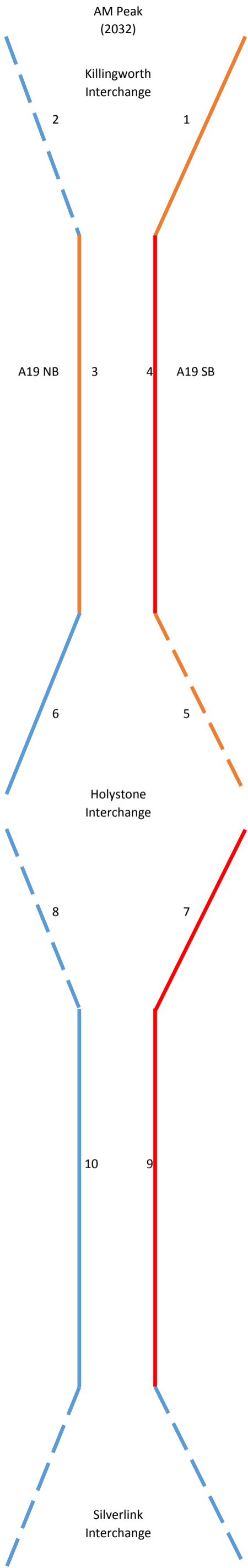
Link	AM Base Flow	AM Growth	PM Base Flow	PM Growth
A19 Killingworth Interchange SB on-slip	894	37%	671	38%
A19 Killingworth Interchange NB off-slip	467	79%	909	32%
A19 NB Mainline Holystone – Killingworth	2126	47%	2596	29%
A19 SB Mainline Killingworth – Holystone	3333	17%	2103	31%
A19 Holystone Interchange SB off-slip	1161	7%	719	24%
A19 Holystone Interchange NB on-slip	644	51%	946	14%
A19 Holystone Interchange SB on-slip	498	215%	478	136%
A19 Holystone Interchange NB off-slip	560	51%	862	48%
A19 SB Mainline Holystone – Silverlink	2669	59%	1862	63%
A19 NB Mainline Silverlink – Holystone	2042	47%	2512	41%

2.4 Highways England Meso-scopic modelling

Following the initial work undertaken by NTC using their Strategic Traffic Model Highways England are undertaking their own detailed assessment of the SRN in the region. HE are preparing a Meso-scopic model using the Aimsun software package which is more adept at accurately assessing the merge/diverge arrangements along the SRN.

Whilst HE agree with the need to upgrade the A19 slip-roads and mainline sections identified in NTC's own work the outcomes of the Meso-scopic modelling assessment will be used to agree the timescales for the delivery of these improvements. The outcomes of the assessment are anticipated to be completed in early 2017 and NTC will continue dialogue with HE to agree timescales and provide support towards the scheme submissions as Road Investment Strategy (RIS) 2 and 3 bids for DfT funding.

Appendix A - A19 SRN Impacts



Link	AM											PM								
	Link Capacity					Growth (2013 - 2032)		MG	KM	LP Growth (Resi)		Link Capacity					Growth (2013 - 2032)		LP Growth (Resi)	
	2013	2018	2022	2027	2032	Vehs	%	0%	0%	All	unconsented	2013	2018	2022	2027	2032	Vehs	%	All	unconsented
1	64%	75%	79%	83%	88%	335	37%	7%	12%	30%	9%	48%	54%	58%	62%	66%	252	38%	45%	28%
2	33%	43%	49%	54%	60%	368	79%	12%	5%	27%	16%	65%	68%	74%	80%	86%	289	32%	40%	16%
3	59%	73%	77%	82%	87%	1,000	47%	0%	0%	36%	19%	72%	80%	84%	88%	93%	746	29%	24%	13%
4	93%	103%	105%	107%	109%	578	17%	0%	0%	19%	5%	58%	67%	70%	73%	76%	646	31%	49%	27%
5	83%	70%	76%	82%	89%	78	7%	35%	0%	10%	1%	51%	53%	57%	60%	64%	171	24%	88%	46%
6	46%	49%	56%	63%	70%	330	51%	0%	0%	58%	36%	68%	58%	65%	71%	77%	136	14%	17%	5%
7	36%	99%	103%	108%	112%	1,070	215%	0%	27%	31%	11%	34%	70%	73%	77%	81%	651	136%	22%	17%
8	40%	60%	60%	60%	60%	286	51%	0%	0%	27%	16%	62%	79%	83%	87%	91%	413	48%	58%	16%
9	74%	114%	115%	117%	118%	1,572	59%	0%	13%	27%	9%	52%	77%	80%	82%	84%	1,166	63%	27%	17%
10	57%	77%	79%	81%	83%	956	47%	0%	0%	25%	13%	70%	88%	91%	95%	98%	1,024	41%	39%	15%

Capita Property and Infrastructure Ltd

North Tyneside Council

The Quadrant

The Silverlink North

Cobalt Business Park

North Tyneside NE27 0BY