

North Tyneside Strategic Traffic Model

Modelling Technical Note
February 2015

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Appendix A

1. Introduction

1.1 Commission

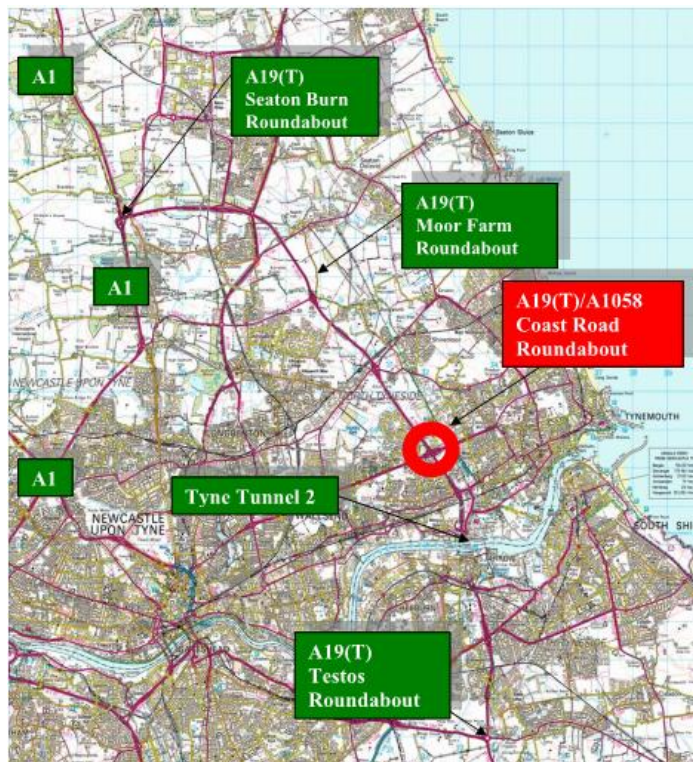
Capita have been commissioned by North Tyneside Council to develop the existing A19 Highway Assignment Model (HAM) – developed for the HA by Arups in 2013 – to provide a model that calibrates successfully against observed traffic flow and journey time data for North Tyneside.

The model is to be used initially in assessing the impacts on the highway network of the future developments identified in the draft North Tyneside Local Plan – together with those granted planning permission since the development of the A19 HAM.

1.2 A19 HAM

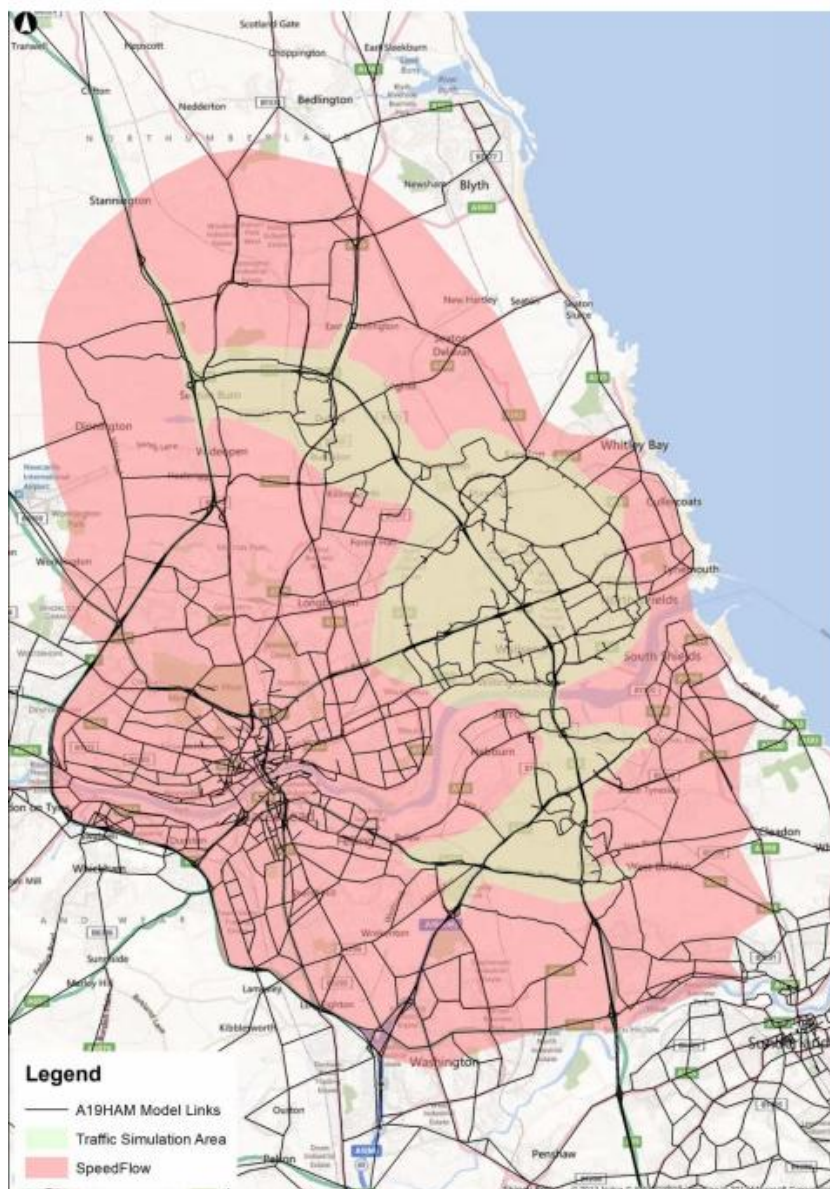
The A19 HAM is a SATURN highway assignment model, calibrated and validated against 2012 base year data – traffic flows and journey times. The model was developed specifically to allow a robust assessment of the likely impacts, and economic justification, of the proposed A19(T)/A1058 Coast Road/Silverlink Improvement Scheme. The location of the scheme in relation to the surrounding strategic highway network is presented below.

Figure 1.1 - A19(T)/A1058 Coast Road Junction and Surrounding Strategic Highway Network



The area modelled includes detailed junction modelling (simulation) predominantly for the A19(T) corridor, taking into account the Silverlink Retail Park, the Cobalt Business Park, the Tyne Tunnel Trading Estate and the largely residential area around Battle Hill Drive located to the west of the A19(T). The model includes an annular buffer area around the simulation area, where speed-flow formulae have been applied – including Newcastle, Gateshead and areas of North and South Tyneside. For the remainder of the conurbation (Sunderland) and its hinterland the road network is represented using fixed speed links. The modelled area is presented in Figure 1.2 below.

Figure 1.2 - A19 HAM Modelled Area



The main features of the A19 HAM are:

- Three time periods have been modelled (weekday am and pm peak hours and an average inter peak hour);
- Represents the highway network conditions during October 2012;
- Models cars, light goods and heavy goods vehicle classes separately;
- The following journey purposes have been modelled;
 - Home based work;
 - Home based other;
 - Home based employers business;
 - Non home based other; and
 - Non home based employer's business
- Includes capacity restraint mechanisms through junction modelling and speed/flow relationships.

The matrices have been developed using a combination of observed OD data from 2013 Road Side Interview (RSI) surveys and matrices from the Tyne and Wear Transport Policy Model (TPM), with matrix estimation implemented to achieve acceptable calibration and validation against flow and journey time data. The RSI surveys carried out in 2013 targeted key movements at the A19 junctions with the A191, the A1058, the A193 and the Tyne Tunnel, together with a survey on Middle Engine Lane, south west of The Silverlink.

In general the A19 HAM calibrates and validates well with the WebTAG criteria for flow and journey time accuracy met in the majority of cases. Where the criteria are not met the discrepancies relatively minor.

2. Review of A19 HAM

Although the A19 HAM calibrates and validates well against WebTAG guidelines, there are a number of reasons why its use to model the impacts of development across North Tyneside is likely to be problematic. These are briefly discussed below.

2.1 Origin-Destination Data

The model was developed specifically to assess the proposed improvement to the A19(T)/A1058 junction. RSI surveys carried out in 2013 were therefore designed to allow the likelihood of reassignment to the junction as a result of the scheme (and away from the junction without the scheme as congestion increases). Although A19(T) traffic was also surveyed at the Tyne Tunnel, the surveys provided no information for a large proportion of movements and routes within North Tyneside. The vast majority of the origin destination movements with North Tyneside are taken from the TPM model which is based on observed data from 2005 and earlier. This data is significantly older than the 5 year maximum recommended age.

2.2 Estimates of Delay

The majority of the Tyneside network (and a significant proportion of the North Tyneside network) has been modelled using speed-flow curves, with no detailed junction modelling carried out. Whilst this reproduces observed flows in the base model, it is unlikely to accurately reflect changes in delays due to increased volumes of traffic.

2.3 Network Coding

As set out above, a significant proportion of the North Tyneside network has been coded using speed-flow curves with no detailed junction coding. As the purpose of this study is to assess where improvements to the network will be required due to future development it is clear that the model network must be an accurate representation of the actual road network.

2.4 General Issues

In addition to the above more general issues, a detailed review of the model identified the following issues specific to North Tyneside:

- A small number of significant roads have not been included in the model;
- A number of zones have been loaded onto the network at the wrong location;
- There are errors in the coding of some significant junctions;
- The model calibrates poorly at some locations – particularly the A191 east of the A19.

3. Development of Base Model

3.1 Network and Matrix Coding

The base model has been extensively amended to replace all of the speed-flow curves with detailed coding of all significant junctions within North Tyneside. The most significant areas where speed-flow curves have been replaced are:

- A191 west of Station Road
- A188 south of Burradon
- A1056 west of Killingworth
- A192 south of A191 Fox Hunter's

Relatively minor errors in the coding of a number of junctions within North Tyneside were also corrected.

Where zones were loaded at incorrect locations, this was corrected by identifying the correct points at which traffic would enter the coded network. The matrices were further adjusted by factoring the total trips from a base year of 2012 to a revised year of 2013.

3.2 Analysis of Model Output

Following the corrections to the base model identified above, the model was rerun to determine how well it represented observed base year conditions. This was done against traffic flows only and demonstrated that the model did not reproduce observed flows to within the accuracy required in WebTAG. For both the am and pm peak periods the proportion of links where the GEH value was less than 5 was approximately 50% - WebTAG guidance gives a value of 85% or more.

3.3 Matrix Estimation

In order to improve the accuracy of the base model matrix estimation was applied using all available traffic count data for the north Tyneside network collected between 2012 and 2014 (factored to 2013 levels). The accuracy of the model was then assessed against traffic flow and journey time observed data. In both cases the model met the acceptability criteria set out in WebTAG.

4. Future Year Trip Matrices

4.1 Forecasting

Trip matrices were developed for a forecast year of 2032, on the assumption that all Local Plan identified housing developments will be completed by this year. In addition, all existing planning permissions will be fully built out – e.g. Cobalt Business Park.

All of the developments identified in the draft Local Plan were allocated to the appropriate SATURN zone and trip generation determined using either TRICS or information supplied by potential developers.

4.2 Distribution

The trips were distributed between origin and destination zones based on a combination of observed data from nearby zones (or the same zone for locations such as Quorum or Cobalt), national census data and gravity models. Given the traffic generated by the level of development proposed (significantly greater than through the application of NTEM forecasts) it has been assumed that there will be no additional growth.

As the study is concerned with the impacts of Local Plan growth on the North Tyneside network, growth forecasts for other Tyne & Wear areas have not been considered in detail. For all zones that did not have a trip end (origin or destination) within North Tyneside, it was assumed that NTEM growth adjusted for Temprow Tyne & Wear forecasts would apply.

4.3 Trip Generation

A summary of the developments included in the assessment is included in Appendix A. In total, it was assumed that approximately 16,000 new homes would be delivered by 2032. The total volume of trips generated by North Tyneside housing developments is set out below.

Table 4.1 - North Tyneside Local Plan Development Trips

	One-Way Trips Generated
AM Peak Hour	10,130
PM Peak Hour	9,387

5. Development of Do-Minimum Model

A Do-Minimum model was developed that reflected the network that will be in place in the absence of the various LDF proposals. This included the following:

Highways Agency Identified Schemes

- A19/A1058 Silverlink Improvement
- A19/A1056 Killingworth Way – traffic signals scheme
- A1/A19 Seaton Burn – although not within North Tyneside this scheme could have a significant impact on the A19 within North Tyneside
- A19/A193 Howdon Interchange

North Tyneside Identified Schemes

- Four Lane Ends pinch point scheme – including Goathland Avenue and Quorum Roundabout
- A1058 Coast Road junctions with Norham Road and Bill Mill
- A193 High Flatworth roundabout improvement

S278/S106 Schemes to Facilitate Consented Developments

- A189/A1056 Weetslade roundabout and Sandy Lane industrial estate signals access
- A188/A189 roundabout and White House Farm access
- A191 improvements – Holystone Way widening, Asda access, Wheatsheaf roundabout filter lane, A19 southbound slip road widening
- A191/Tyne View Park signals improvement
- A1058/A186/Wiltshire Gardens

In addition to the above, a Murton Link Road connecting the A191 at the Norham Road roundabout to the A186 between the A192 and Park Lane was coded into the Do-Minimum. This link is considered to be an integral part of the Murton development, and necessary for the development to progress. The approximate route is presented below.

Figure 5.1 Murton Link Road – Approximate Route



The Do-Minimum model was then run with the 2032 trip matrices – described in section 4, and signal timings optimised to reduce overall congestion and delays.

6. Analysis of Impacts

6.1 Network Improvement Schemes

The Do-Minimum model with full Local Plan development in 2032 was analysed to determine which junctions would be over capacity (an RFC value of greater than 100% was adopted). Because of the very high levels of traffic generated by some developments (in particular Murton and Killingworth) there was severe congestion at a number of key junctions. This had the effect of distorting the overall traffic assignment to the extent that it was not possible to identify realistic impacts on the network without first addressing these issues.

As a result, a number of junction improvement schemes were coded into the SATURN model to give a better representation of network behaviour with full Local Plan development. These are described below.

A19/A191 Holystone Roundabout: a comprehensive improvement of this junction (identified as part of the SEP proposal for the build out of Cobalt) was coded to remove the congestion caused primarily by Murton, but also Killingworth.

A191/Norham Road/Murton Link Road: the existing 5-arm junction was severely over capacity due to the Murton development. Rather than code an improvement scheme, the saturation flows were increased until the junction operated under capacity in the model. This does not reflect a deliverable improvement necessarily, and until further work is carried out it is not clear what improvement here would be required, or whether it can be delivered.

A191/B1505 Wheatsheaf Roundabout: despite proposed improvements to the roundabout it is forecast to be severely congested due primarily to the Killingworth development. As with the A191/Norham Road junction, the saturation flows have been increased until the junction operates within capacity.

In addition to the above, the B1505 Great Lime Road/Forest Hall Road junction is forecast to be severely over capacity due to the Killingworth development – it is already over capacity with current traffic flow levels. It was decided not to code an improvement here as it mainly affects the Killingworth development and there are no obvious improvements possible here.

6.2 Impacted Junctions

The model was then re-run with the above capacity improvements to determine which junctions are forecast to be over capacity with full Local Plan developments in place. The junctions forecast to be over capacity are summarised below. AM and PM peak hour plans showing the locations of these junctions, the scale of the impact, the predicted traffic growth on the network and the proximity of the large Local Plan residential sites are included in Appendix A.

Junctions over Capacity in AM Peak Hour

- A19/A191 Holystone Roundabout
- A191/Norham Road/Murton Link Road roundabout
- A191/B1505 Wheatsheaf Roundabout

- B1505 Great Lime Road/Forest Hall Road signals
- A19/A1056 Killingworth Road proposed signals
- A1058 Beach Road/A192 roundabout
- A1058 Coast Road/Station Road/Wiltshire Gardens
- A193/High Flatworth roundabout

Junctions over Capacity in PM Peak Hour

- A19/A191 Holystone Roundabout
- A191/Norham Road/Murton Link Road roundabout
- A191/B1505 Wheatsheaf Roundabout
- B1505 Great Lime Road/Forest Hall Road signals
- A19/A1056 Killingworth Road proposed signals
- A1058 Beach Road/A192 roundabout
- A1058 Coast Road/Station Road/Wiltshire Gardens
- The over capacity junctions are presented below.

7. Limitations of Study

There are a number of limitations to the work carried out that should be taken into account when considering the outputs and these are discussed below.

7.1 Origin-Destination Data

The original A19HAM is based on a combination of recent O-D data collected around the A19/Sliverlink/Cobalt area and older (more than 6 years old) data taken from the TPM for the remainder of the model area. This means that whilst the data for the area around the A19/Sliverlink/Cobalt should be good, the remainder of the model is based primarily on out of date O-D data. The quality of the model for areas away from the A19 is therefore open to question.

7.2 Wider Calibration

Whilst the model calibrates well for North Tyneside, no calibration has been carried out for the remainder of the model following the extensive amendments to the network in North Tyneside, and the amendments to the matrix through matrix estimation – which will have changed trip totals outside of North Tyneside. Although the study is concerned with the impacts in North Tyneside, if the model calibrates badly in the wider area it could affect forecast flows in North Tyneside.

7.3 Transport Improvements

The model does not include likely future highway improvements outside of North Tyneside – such as Cowgate roundabout, Scotswood Road, Hadrick's Mill etc. These schemes could significantly affect the assignment of traffic in North Tyneside in the 2032 assessment.

7.4 Development Trips

The impact of individual developments has only been considered for North Tyneside. For the remainder of the model area, NTEM factors, adjusted for local growth have been applied. This may have an impact on the assignment of trips and volume of trips on the North Tyneside network.

7.5 Capacity Analysis

The capacity analysis to date has been carried out within SATURN – which is not a junction analysis tool. It would be preferable to use more appropriate junction analysis software with flows taken from SATURN, to give more confidence in the results.

7.6 Improvement Schemes

There are a number of improvement schemes that have been coded into SATURN that are crucial to the overall analysis (as without these the assignments produced are unrealistic due to the severe congestion). In some cases notional improvements in capacity have been coded that do not represent a physical scheme. More detailed analysis of these junctions using more appropriate software (e.g. Vissim, Linsig, Arcady) should be carried out of the following junctions:

- A19/A191 Holystone roundabout
- A191/B1505 Wheadsheaf roundabout
- A191/Norham Road/Proposed Murton Link Road

7.7 Next Steps

The work carried out to date has identified where likely improvements to the network are likely to be required to accommodate North Tyneside Local Plan development. It is recommended that the following be carried out to address some of the limitations in the work identified in the previous section.

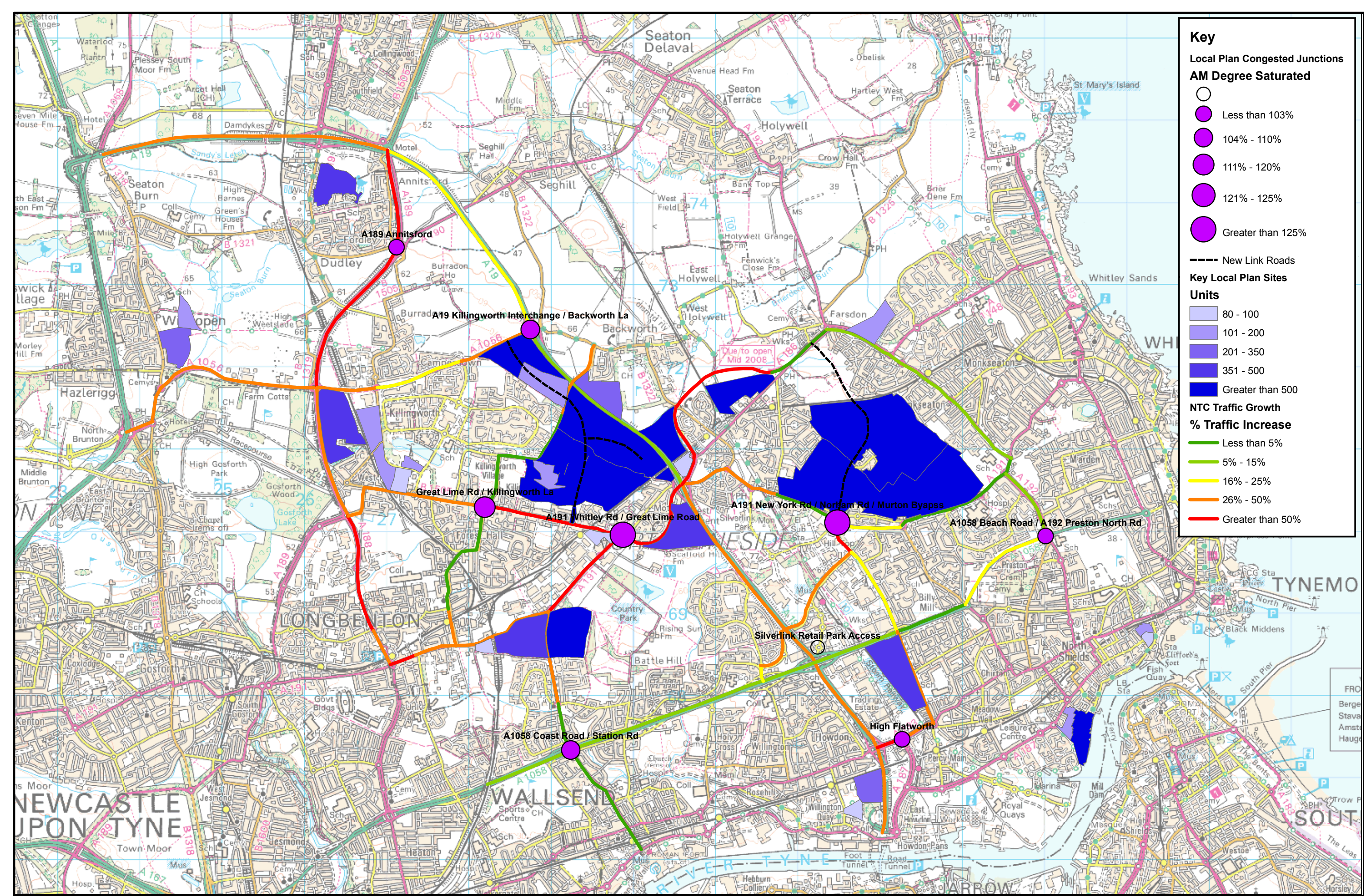
- Carry out scenario testing on alternative development, trip generation/distribution assumptions;
- Analyse junction performance using appropriate modelling software;
- Develop realistic improvement options for key junctions required to facilitate major development proposals at Murton and Killingworth; and
- Identify deliverable package of improvement schemes and sustainable transport proposals to facilitate Local Plan development proposals.

Appendix A

- A.1 Local Plan Residential Sites
- A.2 AM Traffic Impacts
- A.3 PM Traffic Impacts

SITE	Site	Area (Ha)	Capacity (units)	AM Trips		PM Trips	
				Arr	Dep	Arr	Dep
094	Smiths Dock	12.28	800	135	446	334	205
065	Shiremoor West (south)	16.53	590	106	351	262	161
107	Scaffold Hill Farm	23.12	450	57	189	142	87
208	Earsdon View A	20.16	429	64	210	157	96
069	Whitehouse Farm	31.53	366	66	217	163	100
078	Wellfield	12.55	200	26	87	65	40
074	REME Depot	6.80	127	20	68	51	31
113	East Wideopen	13.82	100	17	57	43	26
149	Former Stanley Miller Site	4.13	99	15	50	38	23
070	Tyneview Park	3.82	75	11	36	27	17
362	Hadrian Education Centre	2.49	66	11	35	26	16
114	Land at Great Lime Road (east)	1.01	61	8	26	20	12
330	Land to the east of 'The Covers'	2.01	58	9	31	23	14
224	Crummock Court	0.62	53	7	25	18	11
228	Lidl Foodstore	0.48	49	6	20	15	9
225	Broadway Court	0.58	48	7	23	18	11
226	Phoenix Court	0.74	47	4	12	9	5
116	Land North of Bird Street	0.54	32	2	8	6	4
291	Chapelville	0.28	31	4	15	11	7
343	Marden House	0.38	29	4	14	11	7
239	Bisley Court	0.18	28	4	12	9	5
241	Eldon Court	0.37	26	2	7	5	3
396	Dame Allans Junior School	0.23	25	3	11	8	5
409	Cosalt Factory	0.11	22	3	10	7	5
290	Rosebery Court	0.12	21	3	8	6	4
394	Warwick House	0.06	20	3	9	7	4
395	YMCA Building	0.04	15	2	7	5	3
360	Stanton Grove	0.35	14	2	7	5	3
234	Co Op Buildings	0.28	14	2	8	6	4
359	Lynne Club	0.19	13	1	5	4	2
316	Lilley and Gillie	0.10	12	1	5	4	2
371	Land at Horsham Grove	0.18	12	2	6	4	3
292	Cleveland Centre	0.39	11	2	5	4	2
358	St Edmunds Building	0.40	11	1	5	4	2
249	Linskill Mews	0.17	9	1	3	2	1
357	Station Hotel	0.04	8	1	2	2	1
289	Clifton Court	0.34	8	1	4	3	2
098	Junction of Thornhill Road and East Avenue	0.11	1	0	0	0	0
279	Norgas House	2.76	119	15	50	38	23
113	East Wideopen (north)	6.35	107	17	57	43	26
277	Chan Building (Part of Stephenson Industri	1.51	54	7	23	17	10
336	Spanish City A	1.15	44	5	16	12	7
318	Stephenson House	0.56	24	3	10	8	5
193	Land east of Meadow Drive	0.87	20	3	11	8	5
361	Former Breeze And Pier 39	0.12	14	1	4	3	2
262	Land east of 40 Bell Street	0.07	14	2	6	5	3
076	Murton South	128.58	1750	250	824	617	378
076	Murton North	110.06	1750	250	824	617	378
074	Killingworth Moor	81.02	1500	197	650	486	298
072	Station Road (East)	28.82	650	112	370	277	170
108	A19 Corridor 1 (Killingworth Moor)	63.02	500	92	305	228	140
071	Station Road (West)	24.90	450	48	159	119	73
063	West Chirton South	28.95	420	74	244	183	112
068	Annitsford Farm	17.54	400	79	261	195	120
075	High Farm South	16.21	200	34	112	83	51
097	Site 18R	1.39	50	4	13	10	6
302	Metro Sidings at Waterville Road	1.24	45	6	18	14	8
219	Former site of Marine Park and Cocquet Par	0.59	41	4	13	10	6
314	Norfolk Street & Stephenson Street Car Par	1.03	41	4	12	9	6
009	Police Station	0.16	25	2	7	5	3
250	35 Esplanade	0.07	14	2	7	5	3
110	A19 Corridor 3	15.65	264	43	144	107	66
037	Howdon Tip	11.24	158	19	64	48	29
278	Stephenson Industrial Estate West	7.30	125	16	52	39	24
354	Harvey Combe	11.00	106	14	45	34	21
288	Dock Road Industrial Estate	4.25	97	9	31	23	14
280	Tanners Bank West (S)	1.85	76	10	34	26	16
413	Land at Darsley Park	2.86	74	11	36	27	16
277	Stephenson Industrial Estate East	5.42	70	9	29	22	14
058	Howdon Green	3.54	63	8	26	19	12
099	Land at North Tyneside General Hospital	1.88	61	9	31	23	14
038	Langdale Centre	1.43	52	7	23	17	11
274	Parkside School	2.47	52	7	24	18	11
066	Backworth Business Park & Cottages	6.31	51	8	27	20	12
346	Howdon Gas Works	2.96	50	7	23	17	11
410	Units 1 & 2, Wesley Way	1.70	49	8	25	19	12

095	Grieves Row	2.83	49	7	22	16	10
344	Gasometer at Minton Lane	1.63	45	6	19	14	9
083	Tynemouth Victoria Jubilee Infirmary	1.48	41	4	13	10	6
406	Percy Hedley School (Killingworth)	2.42	41	7	23	17	10
223	Land South of Whitley Road	2.25	39	6	19	14	9
092	Moorhouses Reservoir	3.28	38	5	15	12	7
073	East Benton Farm	9.93	38	6	21	16	10
138	St Stephen's Primary School	2.08	36	4	14	11	7
139	St Bartholomew's Primary School	1.22	33	5	16	12	7
062	Kendal Building, Waterville Road	0.81	30	3	11	8	5
315	Albion House	0.79	27	3	9	7	4
233	Fleur De Lis	0.14	27	2	8	6	4
345	Land at Minton Lane	0.75	25	3	11	8	5
377	Land at Sherborne Avenue	0.58	24	3	10	7	5
400	Silverbirch	1.14	24	3	10	8	5
087	Rosehill Road (Persimmon)	4.28	23	2	7	5	3
299	Land at North Shields Metro	0.52	23	2	7	5	3
002	Cedar Grove Block	0.70	19	3	9	7	4
348	Portugal Place Block	0.44	19	2	6	4	3
010	Wallsend Library	0.26	15	2	6	4	3
375	Land to east of Addington Drive	0.75	15	2	7	5	3
257	Carville Hotel	0.12	15	1	4	3	2
369	Land at Telford St	0.36	14	1	4	3	2
251	Beadnell Court	0.22	14	2	6	4	3
253	Bonchester Court	0.22	12	1	3	3	2
370	Land at Shap Road	1.24	11	1	5	4	2
335	High Point Hotel	0.17	11	2	6	4	3
339	Former Coastways Garage	0.59	11	2	6	4	3
046	Alexander Street and Northumberland Street	0.19	11	1	3	2	1
374	Land at Castle Square	2.03	11	2	5	4	2
026	Land adjacent to Bogie Chain	1.03	9	1	4	3	2
267	Kingsbridge and Somervyl Court	0.30	9	1	3	2	1
368	Land at Glebe Crescent	0.42	9	1	4	3	2
373	Land at Park Grove	0.50	9	1	4	3	2
085	Land at 26-37 Clive Street	0.30	9	1	4	3	2
091	Percy Main Bus Depot	0.45	9	1	3	2	1
005	Town Hall (Wallsend Baths)	0.34	9	1	3	2	1
376	Rear of Brookland Terrace	1.22	8	1	4	3	2
311	Land at Albion Road	0.25	8	1	2	2	1
006	Car Park East	0.13	7	1	2	2	1
264	Bude Court	0.16	7	1	4	3	2
256	Byrness Court	0.19	7	1	3	2	1
170	Staithe Avenue	0.36	6	1	2	2	1
378	Land at Netherton Avenue	0.81	6	1	2	2	1
327	Home Group	0.15	6	1	3	2	2
198	Land at Coble Dene	0.24	5	1	2	2	1
008	Car Park West	0.12	5	0	1	1	1
323	Bingo Hall, North Shields	0.12	5	0	2	1	1
324	Land at Waldo Street	0.11	5	1	2	2	1
328	Snooker Hall	0.10	5	1	2	1	1
312	Stephenson House	0.10	4	0	1	1	1
337	Whisky Bends	0.02	4	0	1	1	1
347	Land Adjacent to ROAB Club	0.06	4	0	2	1	1
004	Community Centre	0.07	2	0	1	1	0
259	Land At Former Brig Public House	0.15	0	0	0	0	0
317	Plot 11	2.05	35	6	20	15	9
295	Earsdon Road	1.06	34	5	16	12	7
366	Devonshire Drive	1.69	23	4	12	9	5
307	Percy Hedley School	0.62	17	2	7	5	3
282	Brewhouse Bank A	0.51	14	2	7	5	3
237	Wallington Court	0.36	9	1	5	4	2
189	Charlton Court	1.40	8	1	4	3	2
130	Howdon CSC	0.24	8	1	3	2	1
057	Balliol East	22.97	443	73	240	179	110
379	Gosforth Business Park	10.90	190	20	67	50	31
287	Bellway Industrial Estate	9.21	152	22	73	55	34
333	Land west of Camperdown Industrial Estate	8.14	139	21	69	52	32
331	Longbenton Foods	10.13	97	17	57	43	26
355	Tanners Bank West (N)	2.18	83	13	42	32	19
352	Land at Backworth Metro	3.96	68	11	36	27	17
067	Foxhunters	2.72	46	7	23	17	11
056	West Moor	2.55	43	5	17	13	8
298	Land to the rear of Midhurst Road	1.82	38	6	19	14	9
281	Tanners Bank East	1.17	32	4	14	10	6
001	Hadrian Road (land south of Metro line)	1.15	31	5	16	12	7
284	East George Street	0.87	24	4	13	10	6
285	Hutson Street & East George Street Block	0.45	12	2	7	5	3
			16,000	2357	7779	5820	3568



Key

Local Plan Congested Junctions AM Degree Saturated

- Less than 103%
- 104% - 110%
- 111% - 120%
- 121% - 125%
- Greater than 125%

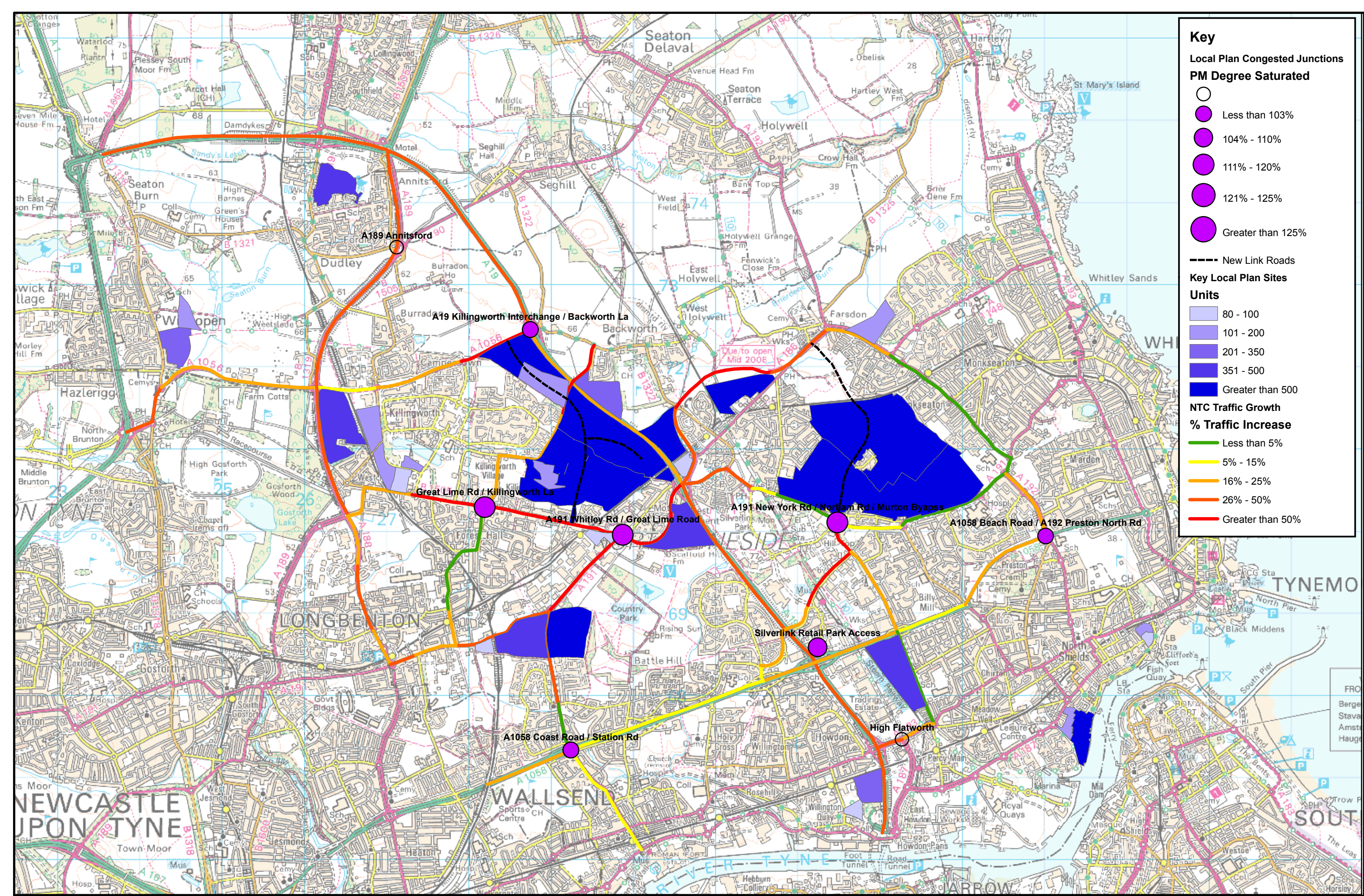
--- New Link Roads

Key Local Plan Sites Units

- 80 - 100
- 101 - 200
- 201 - 350
- 351 - 500
- Greater than 500

NTC Traffic Growth % Traffic Increase

- Less than 5%
- 5% - 15%
- 16% - 25%
- 26% - 50%
- Greater than 50%



Key

Local Plan Congested Junctions

PM Degree Saturated

- Less than 103%
- 104% - 110%
- 111% - 120%
- 121% - 125%
- Greater than 125%

--- New Link Roads

Key Local Plan Sites

Units

- 80 - 100
- 101 - 200
- 201 - 350
- 351 - 500
- Greater than 500

NTC Traffic Growth

% Traffic Increase

- Less than 5%
- 5% - 15%
- 16% - 25%
- 26% - 50%
- Greater than 50%

Capita Property and Infrastructure Ltd

North Tyneside Council
The Quadrant
The Silverlink North
Cobalt Business Park
North Tyneside NE27 0BY