EASTLEIGH BOROUGH COUNCIL LOCAL PLAN: REVIEW OF TRANSPORT ASSESSMENT PARTS 1 AND 2

WSP TECHNICAL NOTE 02

PROJECT: SE 38 18/19 ATK DATE: 15 OCTOBER 2018

PREPARED BY: KARL HOUNSELL

REVIEWED BY: PAUL HAMMOND

1 INTRODUCTION

WSP has been commissioned by Highways England, under the Spatial Planning Framework, to review Eastleigh Borough Council's modelling evidence base underpinning the development of Eastleigh Local Plan proposals for 2036, with regard to its potential impacts on the Strategic Road Network.

The Eastleigh Local Plan evidence base is underpinned by the Solent Transport Sub-Regional Transport Model (SRTM) and this review has only considered the modelling scenario tests undertaken to support this submission, as set out in the following two documents:

i. Systra Technical Note *'SRTM Modelling – Comparison of Development Options (Transport Assessment Part 1)'* dated 20 April 2018.
ii. Systra Technical Note *'Part 2 Transport Assessment - Final'* dated 18 May 2018.

2 SRTM MODELLING – COMPARISON OF DEVELOPMENT OPTIONS (TRANSPORT ASSESSMENT PART 1)

2.1 OVERVIEW

This Systra Technical Note provides some background on the Solent Transport Sub-Regional Transport Model (SRTM); details of the scenarios that were tested in the model to assess the impact of potential packages of 'off-site' infrastructure schemes to mitigate the congestion impacts of the Eastleigh Local Plan; provides detailed plans of the proposed 'off-site' infrastructure schemes; and outlines results for each scenario tested.

2.2 SRTM BACKGROUND

The SRTM 2015 base year model has been developed using SATURN software. The SRTM contains a suite of transport models and an associated Local Economic Impact Model (LEIM). The suite comprises of the Main Demand Model (MDM), the Gateway Demand Model (GDM), Road Traffic Model (RTM) and Public Transport Model (PTM).

The modelled area of the SRTM is divided into four regions, which differ by zone aggregation and modelling detail. Eastleigh Borough is within the Core Fully Modelled Area of the SRTM. The zoning system used within the model is considered appropriate and given the coverage it is suitable for the Eastleigh Local Plan assessment.

The modelled periods cover the weekday AM, Inter and PM peak periods.

- AM Peak Period (07:00 – 10:00);
- Inter Peak Period (10:00 – 16:00); and
- PM Peak Period (16:00 – 19:00).

In the case of the AM and PM peaks, the busiest hour is modelled and in the case of the inter peak the average over the six-hour period is modelled.

The model coverage and the time period choices are generally considered appropriate although a review of the Local Model Validation Report (LMVR) was not included in the scope of this current work and therefore a review of the validation statistics in Eastleigh Borough and its surrounding area has not been undertaken. Without this, it is difficult to categorically conclude regarding the robustness of the model for the Local Plan assessment.

The SRTM was used to help inform and evidence Eastleigh Borough Council's (EBC) Local Plan covering a period up to 2036. It was utilised to assess the impact of the proposed land allocations and to identify key transport implications resulting from the scale and location of the allocations.

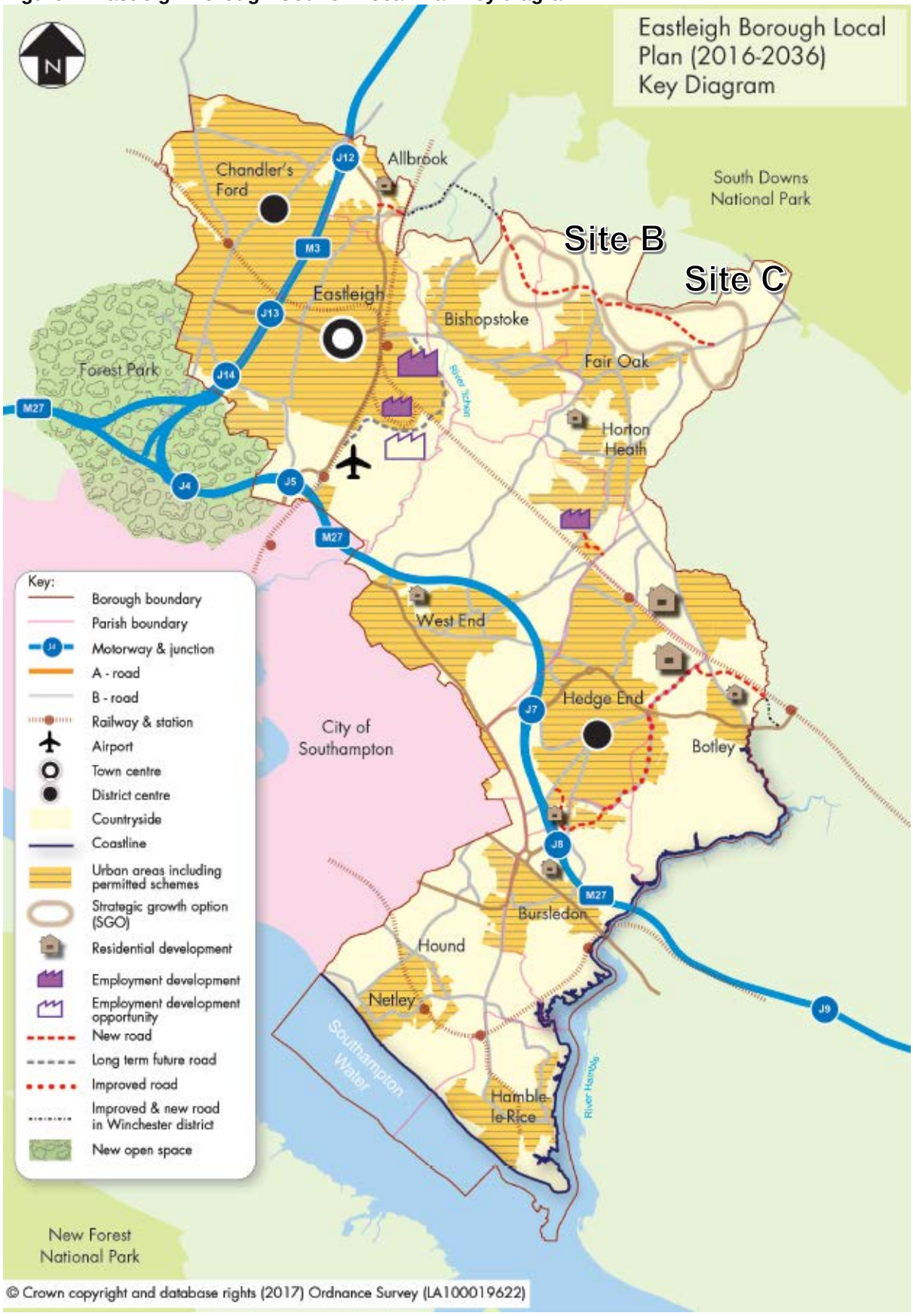
EBC commissioned Systra to undertake a Baseline scenario assessment and a number of Do Minimum scenario assessments for 2036. In July 2017, EBC identified an emerging Local Plan strategy with a 5,200 dwelling Strategic Growth Option (SGO) incorporating expansion of Fair Oak and Bishopstoke to the north/north east of the borough with related development in Allbrook village (Site B) and expansion to the north and east of Fair Oak (Site C), alongside provision of a new link road in North Bishopstoke and Allbrook. A diagram showing the key elements of the strategy was provided as part of the EBC Proposed Submission Local Plan document and is reproduced in Figure 1 overleaf, with additional labels highlighting the identity of each SGO site.

Initial modelling using the SRTM identified a number of severe traffic congestion impacts that resulted from this emerging SGO scenario. Whilst a range of transport interventions to address these issues was being developed, an Interim Do Something model was commissioned by EBC to provide indicative results to demonstrate that the emerging SGO option can be accommodated acceptably on the highway network.

The results from this commission were reported in the Systra Technical Note *'The Eastleigh Local Plan Interim Do Something'* dated 28 November 2017.

In December 2017 Eastleigh Borough Council agreed that their Local Plan for submission would feature the SGO of around 5,200 dwellings located at sites B and C and Transport Assessment Part 1 assesses the impact of potential packages of 'off-site' infrastructure schemes to mitigate the congestion impacts of the Local Plan.

Figure 1: Eastleigh Borough Council Local Plan key diagram



2.3 MODELLING SCENARIOS

Transport Assessment Part 1 considered a Baseline and seven Do Something scenarios:

2036 BASELINE SCENARIO

The SRTM reference case forecasts were available for 2019, 2026, 2031, 2036 and 2041. This scenario took the 2036 SRTM reference case network and the 2036 SRTM reference case land use assumptions, including all committed and permissible sites outside of Eastleigh Borough. It is stated that the level of overall development take up within the model is in accordance with TEMPRO (version 7.2) employment and population growth trajectories for the sub-region, which is in line with WebTAG guidelines.

Inside Eastleigh Borough, the SRTM Reference Case inputs were revised to include all the actual site completions since 2015, plus all the hard-committed future developments. This approach is in line with good modelling practice. However, the Eastleigh Borough land use change assumptions used for the 2036 Baseline scenario in the April 2018 Transport Assessment Part 1 differ significantly from those used in the 2036 Baseline scenario in the November 2017 Systra Technical Note *'The Eastleigh Local Plan Interim Do Something'*, as shown in Table 1.

Table 1: 2036 Baseline Eastleigh Borough land use assumption comparison

Floorspace Type	2036 Baseline Eastleigh Borough Land Use Assumptions (2015 – 2036 Change)		
	November 2017	April 2018	Difference
Residential (dwellings)	8,647	8,897	250
Retail (sqm)	13,810	13,810	0
Office (sqm)	3,156	10,280	7,124
Industry (sqm)	24,774	11,870	-12,904
Warehousing (sqm)	9,540	-5,727	-15,267
Primary & Secondary Education (sqm)	Not Given	6,441	n/a
Hotel (sqm)	9,840	9,841	1
Leisure (sqm)	4,448	4,448	0

It would be helpful if clarification could be provided as to the reasons behind these differences, particularly given that on a zone by zone basis, almost a quarter of the 69 zones with non-zero growth have significant differences in their land use assumptions, with zone 252 showing the biggest difference.

As agreed with Hampshire County Council and Highways England in February 2018, the 2036 Baseline scenario included the following strategic and local Eastleigh network highway schemes:

- M3 Smart Motorways – Winchester (Junction 9) to M3 (Junction 14 / link to M27 Junction 4);
- M27 Smart Motorways – Junction 4 to Junction 11
- M27 Junction 8 and Windhover Roundabout RIS1 scheme;
- M27 Junction 9 – Highways England Growth and Housing Fund scheme.
- Fair Oak Road / Sandy Lane / Allington Lane junction improvements;
- Knowle Lane and Church Lane adjustments to better reflect rural narrow roads with pinch points;

- Maypole roundabout - widening the southbound Woodhouse Lane approach to provide two lanes and the widening of the other approach arms to provide increased flare lengths;
- Denhams Corner roundabout improvements – long flares added on Bubb Lane and Botley Road approaches; and
- Whiteley Way – new road linking the existing section of Whiteley Way to the A3051.

2036 DO SOMETHING SCENARIOS

The seven Do Something scenarios were as follows:

- DS1 – SGO sites B and C without the northern link road in North Bishopstoke and Allbrook;
- DS2 – SGO sites B and C with the northern link road (The Council's draft Local Plan option with an intermediate level of off-site infrastructure interventions);
- DS3 – SGO sites B and C with the northern link road (The Council's draft Local Plan option with a high level of off-site infrastructure interventions);
- DS4 – SGO Site C without the northern link road;
- DS5 - SGO Site D consisting of around 2,744 homes south of Bishopstoke Site, plus a partial development of 606 units at Site C;
- DS6 – SGO Site E consisting of around 3,003 dwellings at the Allington Lane Site, plus a partial development of 347 units at Site C; and
- DS7 – SGO Site D consisting of around 2,744 homes at the South of Bishopstoke Site, plus a partial development of 606 units at Site E.

The additional Eastleigh Borough land use assumptions for each Do Something scenario were summarised in Table 7 of Transport Assessment Part 1 and are reproduced below in Table 2.

Table 2: Additional Eastleigh Borough land use assumptions for each 2036 Do Something scenario

Type	DS1-3	DS4	DS5	DS6	DS7
Residential	8,533	7,331	6,477	6,477	6,477
Retail	11,779	10,779	10,579	6,996	10,079
Office	81,200	76,617	81,200	81,200	81,200
Industrial	29,800	29,800	29,800	29,800	29,800
Warehousing	27,000	27,000	27,000	27,000	27,000
School	20,201	16,634	11,275	11,884	11,884
Leisure	400	400	400	400	400

The values in Table 2 were found to be broadly consistent with the breakdown by model zone, contained in Appendices D, H, I, J and K, with the appropriate growth being applied to the appropriate zones. However, combining the residential data in Table 1 with Table 2 (DS 1-3) gives a total extra residential dwelling provision of 17,430 dwellings. This figure exceeds the Eastleigh Local Plan target of 14,580 dwellings between 2016 and 2036 by 2,850 dwellings, not by 2,392 dwellings as stated in Paragraph 11.2.3 of Transport Assessment Part 1. Therefore, clarification is requested to ascertain which figure is correct.

A summary of the additional highway schemes included within the Baseline and each Do Something scenario was provided in Table 8 of Transport Assessment Part 1 and this table is reproduced overleaf in Table 3. This table was found to be broadly consistent with the

more detailed text descriptions contained within Sections 3 to 10 of Transport Assessment Part 1.

Table 3: Additional highway schemes included within each modelled 2036 scenario

Scheme	BL	DS 1	DS 2	DS 3	DS 4	DS 5	DS 6	DS 7
Fair Oak Road / Sandy Lane / Allington Lane (junction improvements)	✓	✓	✓	✓	✓	✓	✓	✓
Knowle Road and Church Lane (adjustments)	✓	✓	✓	✓	✓	✓	✓	✓
M3 and M27 Smart Motorways	✓	✓	✓	✓	✓	✓	✓	✓
M27 J8 and Windhover RIS1 scheme	✓	✓	✓	✓	✓	✓	✓	✓
M27 J9 Highways England Growth and Housing Fund Scheme	✓	✓	✓	✓	✓	✓	✓	✓
Whiteley Way (new link roads)	✓	✓	✓	✓	✓	✓	✓	✓
Northern Link Road (North Bishopstoke Bypass and Allbrook Hill Relief Road)			✓	✓				
M3 J12			✓	✓				
M3 J12 (further improvements)				✓				
Allbrook Way A335 / Allbrook Hill Relief Road new roundabout			✓	✓				
Central Allbrook junction (roundabout to priority)			✓	✓				
Central Allbrook junction (westbound slip from Highbridge Road onto Allbrook Hill)				✓				
Highbridge Road / Northern Link Road (signals)			✓					
Highbridge Road / Northern Link Road (roundabout)				✓				
Botley Road / Eastleigh Road (improvements)		✓	✓	✓	✓	✓	✓	✓
Winchester Road / Mortimers Lane (improvements)			✓		✓	✓	✓	✓
Winchester Road / Mortimers Lane (changed to signals)		✓		✓				
Denhams Corner roundabout (improvements)	✓		✓					
Denhams Corner roundabout (further improvements)		✓		✓	✓	✓	✓	✓
Maypole roundabout (improvements)	✓		✓					
Maypole roundabout (further improvements)		✓		✓	✓	✓	✓	✓
Botley Bypass and related improvements to Woodhouse Lane		✓	✓	✓	✓	✓	✓	✓
Botley Bypass / A334 / A3051 improvements		✓		✓	✓	✓	✓	✓
Eastleigh Station Hill / Romsey Road (roundabout improvements)		✓			✓	✓	✓	✓
Bishopstoke Road / Chickenhall Lane (signalised)		✓			✓	✓	✓	✓
Allington Lane / A27 / Townhill Way (longer flares)				✓				
Allington Lane / A27 / Townhill Way (signalised)		✓			✓	✓	✓	✓
Allington Lane Rail Bridge		✓		✓	✓	✓	✓	✓
A3024 Bitterne Road (corridor improvements)		✓	✓	✓	✓	✓	✓	✓
Link road between Mortimers Lane and Winchester Road at Crowdhill		✓			✓			
Option D Link Road						✓		✓
Quob Lane / Allington Lane (changed to roundabout)							✓	✓
Quob Lane road closure immediately south of							✓	✓

Barbe Baker Avenue								

A summary of the additional public transport schemes included within the Baseline and each Do Something scenario was not provided. However, on the basis of the more detailed text descriptions contained within Sections 3 to 10 of Transport Assessment Part 1, they can be summarised as shown in Table 4.

Table 4: Additional public transport schemes included within each modelled 2036 scenario

Scheme	BL	DS1	DS2	DS3	DS4	DS5	DS6	DS7
Bluestar 2 service enlarged to serve new roads east of Winchester Road		✓	✓	✓	✓			
New half hourly bus from the West of Horton Heath housing development via Mortimers Lane, the Northern Link Road, Highbridge Road, the new relief road and Allbrook Way to Eastleigh bus station and Southampton			✓	✓				
New half hourly bus serving the southern part of Site D via a one-way loop, then via the West of Horton Heath and Fir Tree Lane housing developments, crossing Allington Lane to follow the new access road to join Bishopstoke Road and then following the existing Bluestar 2 route to Southampton						✓		
New half hourly bus from the West of Horton Heath development direct via Allington Road and Townhill Way, then following the existing Bluestar 16 route to Southampton							✓	
New half hourly bus serving the southern part of Site D and the northern part of Site E via an extended version of the DS5 one-way loop then via the West of Horton Heath and Fir Tree Lane housing developments, crossing Allington Lane to follow the new access road to join Bishopstoke Road and then following the existing Bluestar 2 route to Southampton								✓

It should be noted that the proposed new bus service included in DS2 and DS3 will have to be a single deck service due to the low railway bridge on the B3335. This service will consist of 2 buses an hour in each direction and single deck buses in the current Bluestar fleet range from 35 to 43 seats per bus. Therefore, the current maximum seated capacity this new service could carry would be 86, if the biggest buses available were used. Figures 54 and 56 show that the modelled AM peak hour usage of these services is in excess of 90 passengers in both the DS2 and DS3 scenarios, suggesting either standing passengers are assumed or that double deck buses may have been assumed incorrectly, potentially impacting modal split assumptions.

Similar issues exist in DS5 and DS7 which have modelled AM peak hour usages of 179 and 185 respectively, which exceed the maximum capacity (including standing passengers) of a two bus an hour service, even assuming double decker operation, again potentially impacting modal split assumptions.

In addition, can it be confirmed what restrictions have been applied, if any, on HGV's at this key low railway bridge location as, even taking into consideration the proposed measures to increase clearance levels at the bridge, many HGV's will be unable to pass under the bridge and so will likely divert to using Junction 11 to access the M3.

2.4 DETAILED PLANS OF THE PROPOSED 'OFF-SITE' INFRASTRUCTURE SCHEMES

Detailed scheme designs of the proposed 'off-site' infrastructure schemes were provided in the Appendices for the major non-motorway junctions. However, for the plans at M3 Junction 12 only maps showing revised saturation flows were provided for the schemes proposed as part of DS2 and DS3. Therefore, it is requested that more detailed plans are provided at M3 Junction 12 for these two scenarios.

2.5 ANALYSIS OF RESULTS

LAND USE MODEL RESULTS

The population and employment changes, presented in Tables 9 and 10 of Transport Assessment Part 1, appear broadly consistent with the model inputs. The only exception is DS6 which had the same additional Eastleigh Borough land use assumptions as DS7 in all categories, except retail where it had 3,083 sqm less space assumed, and yet it generated 452 more jobs than DS7. This apparent discrepancy should be clarified.

HIGHWAY MODEL RESULTS

Model Noise

Paragraph 14.2.2 of Transport Assessment Part 1 states:

"*An adjusted model wide area is also presented which excludes Portsmouth and the Isle of Wight as there was multiple small changes (model noise) being observed within these areas which were showing a large overall change, unrelated to the Eastleigh changes.*"

However, given that traffic to and from the Isle of Wight can choose to access the island via Portsmouth, Southampton or Lymington, if there were additional delays on the M3 due to the changes in Eastleigh Borough, potentially traffic could reroute away from the M3 and the ports of Southampton and Lymington and instead use the A3 and the port of Portsmouth. Such a switch on the mainland would also lead to the use of a different port on the Isle of Wight which in turn would alter routeings and associated traffic levels on the Island. Therefore, can clear evidence be provided to support the claim that the additional delays in Portsmouth and on the Isle of Wight are indeed unrelated to the changes in Eastleigh Borough. In particular, can evidence be provided to show the scale of any potential rerouting to and from the Isle of Wight, given that if any such rerouting is arising it could impact other parts of the Strategic Road Network, not just the M3 and/or M27.

Botley Bypass and Whiteley Way Extension

Paragraph 14.5.3 of Transport Assessment Part 1 states that:

"*For all scenarios, the addition of the Botley Bypass over the Baseline shows significant re-routing around Botley, and in combination with the extension of Whiteley Way, does also have an overall strategic impact, pulling trips off the Motorway.*"

It is agreed that there is significant re-routing around Botley and, in the westbound direction, there are significant flow increases along the Whiteley Way extension although these increases are not accompanied by significant flow decreases on the westbound M27 in the area. In fact, based on the plots, it is unclear where these additional flows originate from.

In the eastbound direction, flow increases along the Whiteley Way extension are much lower than those observed westbound and flows actually decrease slightly in DS6 and DS7 during

the PM peak and decrease significantly in DS2 during the AM peak. In addition, instead of trips being pulled off the motorway, flows actually increase along the eastbound M27 between Junctions 8 and 9 in all scenarios and time periods shown.

It is recommended that the model coding in the vicinity of the Whiteley Way extension is checked in the eastbound direction given the counter-intuitive eastbound flow changes in this area.

Other Strategic Road Network Flow Impacts

The flow difference diagrams presented in Figures 23 to 36 of Transport Assessment Part 1 do not cover the entire Strategic Road Network in the area. In addition, the individual junctions are not shown in detail and flow changes are hard to read and so impacts are not possible to fully quantify for any of the seven DS scenarios. The biggest impacts, however, are observed in DS2 and DS3.

Strategic Road Journey Time Impacts

No journey time comparisons were provided for the Strategic Road Network and therefore it is not possible to assess the impact on any DS scenario.

The only relevant journey time information provided was for a journey time route between Highbridge, east of Allbrook, and the M3 Junction 12 using the new link road although, as the new link road was not in the Baseline model, comparison with the Baseline was not possible.

3 PART 2 TRANSPORT ASSESSMENT – FINAL

3.1 OVERVIEW

This Systra Technical Note, referred to hereafter as 'Transport Assessment Part 2', looks in more detail at the impacts of the Council's draft Local Plan preferred option with an intermediate level of off-site infrastructure interventions (DS2) and with a high level of off-site infrastructure interventions (DS3). DS2 and DS3 are renamed within Transport Assessment Part 2 to be Do-Something and Do-More respectively.

3.2 MODELLING SCENARIOS

Transport Assessment Part 2 considered the following scenarios:

- 2036 Baseline;
- 2036 Do-Something (previously DS2); and
- 2036 Do-More (previously DS3).

It is assumed that all transport improvements and interventions included in each scenario remain the same as described in Transport Assessment Part 1. However, this does require clarification, as the description of the highway improvements and interventions appears to differ between Transport Assessment Part 1 and Part 2. Also, in Transport Assessment Part 1, no walking and cycling measures were listed whereas, in Transport Assessment Part 2, a number of strategic footpath, cycleway and bridleway improvements across the borough are proposed.

3.3 MODELLING RESULTS

PEAK HOUR STRESS

To assess the peak hour stress on the network in each scenario, the ratio of Volume to Capacity (V/C) was calculated on each road and junction. A V/C value at or above 80% indicates that a road or junction is approaching its maximum capacity and likely to be experiencing congestion and delays. A value of 90% is normally taken as the practical capacity value for design purposes. A value in excess of 100% means that the junction is over capacity and significant queues and delay are likely to occur.

The results were presented in Figures 12, 13 and 14 along with Table 6 of Transport Assessment Part 2. Unfortunately, the figures are zoomed out too far to be able to see the results for each of the Strategic Road Network links and junctions. Also, it appears that not all locations listed in Table 6 are visible on the figures, potentially due to the level of zoom. Table 6 does appear to list all locations shown in the figures, but only indicates if the V/C is over 80%, not if it exceeds 100% or if it equals 80%.

It is also of note that Table 6 contains no entries for the M27 Westbound or the M3 Northbound main carriageways. Given that data for these sections is also not included in Appendix B of Transport Assessment Part 2, can it be confirmed that these motorway sections were actually included within any analysis undertaken within Transport Assessment Part 2 and, if so, can it be confirmed that the V/C values on these two sections are all below the 80% threshold in all time periods and scenarios?

Table 5 below summarises the data that is presented in Table 6 of Transport Assessment Part 2 for Strategic Road Network links and junctions. It includes entries for M27 J7 and M27 J8 but does not specify the exact location or direction within the junction and so it is requested that this is confirmed.

Table 5: Strategic Road Network links and junctions with V/C >80% in 2036

Junction/Link	Baseline		Do-Something		Do-More	
	AM	PM	AM	PM	AM	PM
M27 J5 Roundabout	✓	✓	✓	✓	✓	✓
M27 J5 Eastbound on-slip merge	✓	✓	✓	✓	✓	✓
M27 Eastbound – J5 to J7	✓	✓	✓	✓	✓	✓
M27 J7		✓		✓		✓
M27 J7 Roundabout	✓	✓	✓	✓	✓	✓
M27 J7 Eastbound off-slip diverge	✓	✓	✓	✓	✓	✓
M27 J7 Eastbound on-slip merge	✓	✓	✓	✓	✓	✓
M27 Eastbound – J7 to J8	✓	✓	✓	✓	✓	✓
M27 J8 Eastbound off-slip diverge	✓	✓	✓	✓	✓	✓
M27 J8	✓		✓		✓	
M3 J12 / Allbrook Way Roundabout	✓	✓	✓	✓	✓	✓
M3 J12 Southbound off-slip diverge		✓		✓		
M3 J12 Northbound Roundabout	✓	✓	✓	✓	✓	✓
Winchester Road / Otterbourne Hill Roundabout		✓	✓	✓	✓	✓

SEVERITY OF EASTLEIGH BOROUGH LOCAL PLAN IMPACT

To assess the severity of the impacts arising from the Eastleigh Borough Local Plan proposals, the following assessment criteria were used by Systra:

- A junction where the V/C on any approach arm was 85% or more in the Do-Something or Do-More scenario and has increased by 5% or more compared with the Baseline scenario, is considered as experiencing a *significant* impact;
- A junction where the V/C on any approach arm was 95% or more in the Do-Something or Do-More scenario and has increased by 10% or more compared with the Baseline scenario, is considered as experiencing a *severe* impact.; and
- A junction where the average delay per vehicle in the Do-Something or Do-More scenario was two minutes or more in any period and has increased by one minute or more compared with the Baseline scenario, is considered as experiencing a *severe* impact.

Based on the above criteria, which appear arbitrary and require further justification, Table 6 shows the junctions on the Strategic Road Network that were identified as experiencing significant or severe impacts. It is noticeable that the additional mitigation measures included in the Do-More scenario actually give rise to additional impacts at the M3 Junction 12 / Allbrook Way roundabout and the M27 Junction 7 roundabout.

Table 6: Strategic Road Network links and junctions with V/C >80% in 2036

Junction	Do-Something		Do-More	
	AM	PM	AM	PM
M3 J12 / Allbrook Way Roundabout			Significant	Severe
M3 J12 Northbound Roundabout	Severe	Significant	Severe	Significant
Winchester Road / Otterbourne Hill Roundabout	Severe	Severe	Severe	Severe
M27 J7 Roundabout				Significant

Throughout the remainder of the analysis in Section 6.5 of Transport Assessment Part 2, the impacts on the arms of each junction assessed are classified as Significant or Severe, however, it has not been stated what criteria has been used to make these classifications. It could reasonably be assumed that the same criteria, as outlined earlier, have been used despite the criteria now being applied to individual arms at junctions and not junctions as a whole, but the classifications that have been assigned to many of the arms are inconsistent with those earlier criteria and so this needs clarifying.

M3 Junction 12 Allbrook Way Roundabout

The results from the model at this junction were summarised in Tables 36 and 37 of Transport Assessment Part 2 and are reproduced below in Table 7, where DS denotes the Do-Something scenario and DM denotes the Do-More scenario.

Table 7 also incorporates actual flows taken from the data presented in Appendix B of Transport Assessment Part 2, which was found to be consistent with Tables 36 and 37.

Table 7: M3 Junction 12 Allbrook Way Roundabout junction performance data

Arm	Time Period	Actual Flow (pcu)			V/C (%)			Average Queue (pcu)			Delay (s/pcu)		
		BL	DS	DM	BL	DS	DM	BL	DS	DM	BL	DS	DM
A335 Allbrook Way	AM	844	1624	966	106	106	101	33	59	11	146	137	46
	PM	799	1447	995	104	85	93	24	2	3	111	9	17
M3 Southbound off-slip	AM	519	609	508	93	87	100	3	1	6	22	10	45
	PM	593	609	538	106	105	106	22	22	22	139	136	154
Winchester Road	AM	796	1541	1783	112	104	83	50	35	1	242	86	6
	PM	837	1566	1749	107	103	81	34	32	1	152	77	6
A335 motorway bridge	AM	599	30	682	73	4	94	0	0	2	6	6	14
	PM	637	475	755	77	65	102	0	0	12	6	7	62

Paragraphs 6.5.40 to 6.5.43 of Transport Assessment Part 2 provided some analysis of this junction performance data, however, much of this analysis was found to be inconsistent with the data presented in Tables 36 and 37 and therefore requires amendment.

In the Do-Something scenario, despite the large flow increase, the mitigation measures included at the junction ensure that there is no net worsening of V/C values on any approach, although, during AM peak, the A335 Allbrook Way and Winchester Road approaches remain above capacity and during the PM peak the M3 Southbound off-slip and Winchester Road approaches remain above capacity.

Average queue lengths in the Do-Something scenario remain the same or improve on all arms except on the A335 Allbrook Way approach during the AM peak where the average queue length almost doubles to 59 pcu. On the M3 Southbound off-slip, the maximum average queue length predicted by the model is 22 pcu during the PM peak, which could be easily accommodated within the approximately 300m long off-slip.

Flows in the Do-Something scenario increase on all arms except the A335 motorway bridge approach, with flows on the A335 Allbrook Way and Winchester Road approaches almost doubling in both peaks and flows on the M3 Southbound off-slip increasing 17% during the AM peak and 3% during the PM peak.

On the A335 motorway bridge approach, flows during the AM peak significantly decrease from 599pcu to just 30pcu. Paragraph 6.5.42 of Transport Assessment Part 2 explains that this decrease is due to increased delays at the adjacent M3 J12 Northbound Roundabout in the Do-Something scenario, causing traffic to divert away from the junction onto alternative routes. Given the amount of traffic predicted by the model to divert away from the northbound M3 prior to Junction 12, further evidence is required to help understand the full impact on M3 J12 and the wider Strategic and Local Road Network of this very large and surprising flow change, to establish if this rerouting and its associated impacts are considered realistic and acceptable.

In the Do-More scenario, the model predicts that V/C values will be significantly worse on the A335 motorway bridge approach, with the V/C increasing from 73% to 94% during the AM peak and 77% to 102% during the PM peak, compared to the Baseline scenario. Unlike the Do-Something scenario, there is no large flow reduction at this location, instead flows increase by 14% during the AM peak and 19% during the PM peak.

On the M3 Southbound off-slip, the V/C remains over capacity at 106% during the PM peak and increases up to capacity at 100% during the AM peak, despite a slight decrease in flow.

Delays also increase on this approach, doubling during the AM peak and increasing by 11% during the PM peak. The maximum average queue length predicted by the model remains at 22 pcu during the PM peak, which could be easily accommodated within the approximately 300m long off-slip.

On the A335 Allbrook Way approach, flows increase by 14% during the AM peak and 25% during the PM peak, due to the additional mitigation measures in the Do-More scenario, but these increases are significantly below those observed in the Do-Something scenario as this approach also gains a dedicated exit to the M3 southbound on-slip in the Do-More scenario and so this flow is excluded from the flow on this approach.

On the Winchester Road approach, compared with the Do-Something scenario, flows are 16% higher during the AM peak and 12% during the PM peak, although average queues and delays decrease due to the additional mitigation measures included within the Do-More scenario.

M3 Junction 12 Northbound Roundabout

The results from the model at this junction were summarised in Tables 48 and 49 of Transport Assessment Part 2 and are reproduced below in Table 8 where DS denotes the Do-Something scenario and DM denotes the Do-More scenario.

Table 8 also incorporates actual flows taken from the data presented in Appendix B of Transport Assessment Part 2, which was found to be consistent with Tables 48 and 49.

Table 8: M3 Junction 12 Northbound Roundabout junction performance data

Arm	Time Period	Actual Flow (pcu)			V/C (%)			Average Queue (pcu)			Delay (s/pcu)		
		BL	DS	DM	BL	DS	DM	BL	DS	DM	BL	DS	DM
M3 Northbound off-slip	AM	600	30	682	100	101	74	6	2	1	42	280	10
	PM	650	503	755	102	106	78	12	21	1	70	157	10
A335 Westbound	AM	623	908	926	71	104	106	0	20	29	5	74	110
	PM	567	758	811	65	87	93	0	0	0	5	5	5

In the Do-Something scenario, during the AM peak on the M3 Northbound off-slip the flow decreases significantly from 600 pcu to 30 pcu, the delay increases significantly from 42 seconds per pcu to 280 seconds per pcu and, counter-intuitively, the average queue length decreases from 6 pcu to 2 pcu. This flow change is impacted by the flow on the A335 Westbound approach which increases from 623 pcu to 908 pcu thereby reducing the number of gaps available for vehicles to exit the off-slip approach. However, the flow on the M3 Northbound off-slip is considered both surprising and unrealistically low.

This conclusion is further supported by the results from the Do-More scenario, in which the only change at this junction is an extended flare lane on the off-slip. This change would be expected to, at most, double the number of vehicles able to exit the off-slip onto the roundabout (compared to the Do-Something). However, in the Do-More scenario the flow on the A335 Westbound approach is 926 pcu (18 pcu higher than in the Do-Something scenario) and yet the flow on the M3 Northbound off-slip is increased to 682 pcu from 30 pcu.

It is recommended that the junction coding, in particular the gap acceptance values and saturation flows, are reviewed at this junction to ensure accuracy and consistency. It is considered that errors may exist in both scenarios with the Do-Something coding potentially

allowing too little capacity at the junction leading to flow reductions on the M3 and the Do-More coding potentially allowing too much capacity at this roundabout.

Winchester Road / Otterbourne Hill Roundabout

The results from the model at this junction were summarised in Tables 38 and 39 of Transport Assessment Part 2 and are reproduced below in Table 9 where DS denotes the Do-Something scenario and DM denotes the Do-More scenario.

Table 9 also incorporates actual flows taken from the data presented in Appendix B of Transport Assessment Part 2, which was found to be consistent with Tables 38 and 39.

Table 9: Winchester Road / Otterbourne Hill Roundabout junction performance data

Arm	Time Period	Actual Flow (pcu)			V/C (%)			Average Queue (pcu)			Delay (s/pcu)		
		BL	DS	DM	BL	DS	DM	BL	DS	DM	BL	DS	DM
Winchester Road SB	AM	850	1224	1460	57	76	98	0	0	3	5	5	12
	PM	775	1048	1419	48	65	89	0	0	1	4	5	6
Otterbourne Hill	AM	619	707	476	64	101	104	0	12	17	5	61	133
	PM	738	692	467	75	100	103	0	7	14	6	38	106
Winchester Road NB	AM	835	744	1157	78	67	101	0	0	8	5	4	27
	PM	1056	1157	1185	101	104	105	12	25	30	43	82	93

Conditions at this junction deteriorate significantly, with the Otterbourne Hill approach exceeding capacity during both time periods and in both the Do-Something and Do-More scenarios, as vehicles struggle to find a gap in traffic due to the increased flow on the Winchester Road Southbound approach. This approach also experiences the worst delays with over 2 minutes per pcu during the AM peak and almost 2 minutes per pcu during the PM peak in the Do-More scenario.

The Winchester Road Northbound approach also exceeds capacity during both time periods in the Do-More scenario and average queue lengths are longest on this approach at 25 pcu during the PM peak in the Do-Something scenario and 30 pcu during the PM peak in the Do-More scenario. Delays are also high during the PM peak at 82 seconds per pcu in the Do-Something scenario and 93 seconds per pcu in the Do-More scenario.

The Winchester Road Southbound approach performs best with minimal queuing in both scenarios and time periods, although in the Do-More scenario it has a V/C of 98% during the AM peak and 89% during the PM peak.

M27 Junction 7 Roundabout

The results from the model at this junction were summarised in Tables 62 and 63 of Transport Assessment Part 2 and are reproduced below in Table 10 where DS denotes the Do-Something scenario and DM denotes the Do-More scenario.

Table 10 also incorporates actual flows taken from the data presented in Appendix B of Transport Assessment Part 2, which was found to be consistent with Tables 62 and 63.

Table 10: M27 Junction 7 Roundabout junction performance data

Arm	Time Period	Actual Flow (pcu)			V/C (%)			Average Queue (pcu)			Delay (s/pcu)		
		BL	DS	DM	BL	DS	DM	BL	DS	DM	BL	DS	DM
B3036 Upper Northam Rd	AM	590	594	569	105	106	102	20	22	10	239	250	173
	PM	104	122	140	41	48	55	1	1	1	59	62	66
Circulatory Carriageway Sth	AM	898	893	902	104	103	104	21	19	23	150	139	158
	PM	663	669	700	90	91	95	4	4	5	46	48	61
Charles Watts Way EB	AM	1330	1304	1250	95	93	89	10	10	10	66	59	50
	PM	885	916	943	66	68	89	7	7	10	34	35	50
Charles Watts Way WB	AM	1841	1867	1910	49	50	51	2	2	2	6	6	6
	PM	1783	1768	1813	49	49	50	3	3	3	7	7	7
M27 Southbound off-slip	AM	1271	1310	1309	35	36	36	0	0	0	3	3	3
	PM	1643	1676	1673	45	46	46	0	0	0	6	7	7
M27 Northbound off-slip	AM	1073	1090	1091	60	61	61	23	25	22	127	133	124
	PM	1225	1205	1178	56	56	54	7	7	7	46	50	50

On most approaches flows, delays, average queue lengths and V/C values remain similar to Baseline scenario levels in the Do-Something and Do-More scenarios. The only exceptions occur during the PM peak, when the southern section of the circulatory carriageway experiences an increase in V/C from 90% in the Baseline to 95% in the Do-More and the Charles Watts Way eastbound approach experiences an increase in V/C from 66% in the Baseline to 89% in the Do-More.

The B3036 Upper Northam Road approach and the southern section of the circulatory carriageway both exceed capacity in all scenarios during the AM peak, although delays on the B3036 Upper Northam Road approach during the AM peak reduce somewhat in the Do-More scenario.

ADDITIONAL MOTORWAY IMPACTS

In addition to the junctions highlighted above, the following additional junctions were analysed in further detail in Section 8 of Transport Assessment Part 2:

- M3 Junction 11
- M3 Junction 12
- M3 Junction 13
- M27 Junction 5
- M27 Junction 7
- M27 Junction 8
- M27 Junction 9

It should be noted that the data presented in Tables 87 and 88 of Transport Assessment Part 2 for the eastbound on-slip and westbound off-slip at M27 Junction 5, was not

consistent with the same data presented in Appendix B, with Appendix B assumed to be correct.

Before any conclusions can be drawn on potential impacts at M3 Junction 12, the issues identified in the earlier sections of this report need to be resolved and the results of the ongoing VISSIM modelling at this junction will need to be fully understood.

In addition, Table 11 details the performance of the Winchester Road / Hocombe Road Roundabout, which lies adjacent to the M3 and to the north-west of the Winchester Road / Otterbourne Hill Roundabout. It indicates high levels of rerouting in the area, with much of the PM peak traffic from Hursley (including IBM) to M3 Junction 12 switching route from using Otterbourne Hill in the Baseline scenario to use Hocombe Road in the Do-More scenario. There is also a very large flow change during both periods on the Winchester Road Eastbound approach in both the Do-Something and Do-More scenario which requires further explanation, as this additional flow may have diverted off the M3 mainline, but it is impossible to tell from the data provided.

Table 11: Winchester Road / Hocombe Road Roundabout junction performance data

Arm	Time Period	Actual Flow (pcu)			V/C (%)			Average Queue (pcu)			Delay (s/pcu)		
		BL	DS	DM	BL	DS	DM	BL	DS	DM	BL	DS	DM
Winchester Road WB	AM	700	684	791	61	59	68	0	0	0	4	4	4
	PM	1147	1025	981	99	88	85	0	0	0	4	4	4
Winchester Road EB	AM	487	726	826	47	70	82	0	0	0	5	5	6
	PM	450	627	747	51	68	82	0	0	1	6	7	8
Hocombe Road	AM	364	498	634	39	64	90	0	1	2	5	8	17
	PM	325	421	672	34	50	88	0	0	2	5	6	13

Subject to the issues at M3 Junction 12 not materially affecting any other junction then, based on the data provided within Section 8 and Appendix B of Transport Assessment Part 2, at all the above junctions, except M3 Junction 12, it is agreed that the Local Plan growth is predicted by the model to have, at worst, only a slight adverse effect in both scenarios.

However, the impact of the Local Plan growth within and between the junctions on the M27 and M3 main carriageways is unable to be conclusively determined from Transport Assessment Part 2, as there is no data provided for the westbound M27 or northbound M3 and only minimal data provided for the eastbound M27 and southbound M3. To properly assess the impacts on the main carriageways of the M27 and M3, flow, speed and journey time data is required between M3 Junctions 11 and 14 and M27 Junctions 4 and 9 inclusive, for both time periods and all three scenarios.

4 CONCLUSION

Transport Assessment Parts 1 and 2 form the latest part of Eastleigh Borough Council's modelling evidence base, underpinning the development of Eastleigh Local Plan proposals for 2036. These two Systra Technical Notes build on the previous modelling detailed in Systra Technical Note *'The Eastleigh Local Plan Interim Do Something'* dated 28 November 2017, although the land use assumptions underpinning the Baseline scenario in this latest modelling have changed significantly and the reasons for these big differences should be clarified.

Seven Do Something scenarios were tested in Transport Assessment 1, each assuming different lane use assumptions or a different level of additional highway and public transport schemes, or both. For the DS2, DS3, DS5 and DS7 scenarios, the assumed public transport usage levels appear to be too high, based on vehicle capacity and highway infrastructure restrictions, and therefore require further clarification, given the potential impact of over-estimation on modal split assumptions. In addition, clarification is required as to whether the low bridge on the B3335 has been taken into consideration when setting up permitted HGV routes within the model.

Whilst detailed scheme design plans were provided for the major non-motorway junctions, they were not provided for M3 Junction 12. It is requested that scheme design plans are provided for M3 Junction 12.

Transport Assessment Part 1 identified model noise in Portsmouth and the Isle of Wight as being an issue that should be excluded as it was unrelated to the Eastleigh changes, however, given that traffic to and from the Isle of Wight can choose to access the island via Portsmouth, Southampton or Lymington, if there were additional delays on the M3 due to the changes in Eastleigh Borough, potentially traffic could reroute away from the M3 and the ports of Southampton and Lymington and instead use the A3 and the port of Portsmouth. Such a switch on the mainland would also lead to the use of a different port on the Isle of Wight which in turn would alter routeings and associated traffic levels on the Island. Therefore, evidence is required to show the scale of any potential rerouting to and from the Isle of Wight, given that if any such rerouting is arising it could impact other parts of the Strategic Road Network, not just the M3 and/or M27.

Transport Assessment Part 1 presented flow difference diagrams, however, these did not show any motorway junction in detail, did not cover the entire Strategic Road Network in the area and were hard to read and so impacts on the Strategic Road Network were not possible to establish. Journey time data was also not provided for the Strategic Road Network.

Transport Assessment Part 2 looked in more detail at the impacts of the Council's draft Local Plan preferred option with an intermediate level of off-site infrastructure interventions (Do-Something) and with a high level of off-site infrastructure interventions (Do-More). The Do-Something scenario appeared to be the DS2 scenario from Transport Assessment 1 and the Do-More appeared to be the DS3 although this requires clarification as their descriptions appeared to differ slightly.

In addition, it was noted that mitigation measures included in the Do-More scenario actually gave rise to additional negative impacts at the M3 Junction 12 / Allbrook Way roundabout and the M27 Junction 7 roundabout.

Before any conclusions can be drawn on potential impacts at M3 Junction 12, the results of the ongoing VISSIM modelling at this junction will need to be fully understood. The SRTM modelling has, however, given rise to some initial significant concerns relating to both potential capacity and coding issues at the two separate roundabouts that make up this junction. The coding issue on the M3 Northbound off-slip requires urgent clarification as, if proven to be an issue, would likely affect the flows being used in the VISSIM modelling.

In addition, analysis of data at the Winchester Road / Hocombe Road Roundabout, adjacent to M3 Junction 12, indicates high levels of rerouting in the area with much of the PM peak traffic from Hursley (including IBM) to M3 Junction 12 switching route from using Otterbourne Hill in the Baseline scenario to use Hocombe Road in the Do-More scenario. There is also a

very large flow change during both periods on Winchester Road travelling eastbound at this junction in both scenarios which requires an explanation as this flow may have diverted off the M3 mainline, but it is impossible to tell from the data provided.

Volume to Capacity (V/C) ratios were calculate for each link and junction and used to classify the severity of the Local Plan impact. Subject to the issues at M3 Junction 12 not materially affecting any other junction then, based on the V/C, average queue, delay and actual flow data presented, it is agreed that, away from the main carriageway, at M3 Junctions 11 and 13 and M27 Junctions 5, 7, 8 and 9 the Local Plan growth is predicted by the model to have, at worst, only a slight adverse effect in both scenarios.

The impact of the Local Plan growth within and between the junctions on the M27 and M3 main carriageways is unable to be conclusively determined from Transport Assessment Part 2, as there is no data provided for the westbound M27 or northbound M3 and only minimal data provided for the eastbound M27 and southbound M3. To properly assess the impacts on the main carriageways of the M27 and M3, flow, speed and journey time data is required between M3 Junctions 11 and 14 and M27 Junctions 4 and 9 inclusive, for both time periods and all three scenarios.