Fareham Local Plan Reference number 110702 04/02/2022

FAREHAM LOCAL PLAN – SRTM STRATEGIC MODELLING











FAREHAM LOCAL PLAN

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1. INTRODUCTION

1.1 Study Background

- 1.1.1 SYSTRA has been commissioned by Fareham Borough Council (FBC) to apply Solent Transport's Sub-Regional Transport Model (SRTM) to help inform the update to Fareham's Local Plan. The SRTM has been used to model the proposed land allocations and identify key transport implications resulting from the scale and location of the allocations. The SRTM outputs form inputs to a Transport Assessment undertaken by Hampshire Services and reported in a separate document.
- 1.1.2 This application of the SRTM was commissioned by FBC in June 2021.

1.2 Fareham Borough Council Local Plan Development Scenarios

- 1.2.1 To assess the transport impacts of the Local Plan, three model scenarios have been commissioned:
 - Scenario 1 2036 Baseline, no Fareham Local Plan development except for committed sites.
 - Scenario 2 2036 Do Minimum, full Fareham Local Plan development without transport mitigation.
 - Scenario 3 2036 Do Something, full Fareham Local Plan development with transport mitigation.

Scenario 1 – 2036 Baseline No Fareham Local Plan Development Except Committed Sites

- 1.2.2 The Baseline forms the scenario against which the proposed Local Plan development quantum scenarios will be assessed.
- 1.2.3 In this study the Baseline includes all current (at time of commissioning) completed development and infrastructure within Fareham, in addition to all committed development and infrastructure through to 2036. In the Baseline, no allowance is made for Local Plan allocations in Fareham. For clarity, the development at Welborne is considered to be committed and is included within the Baseline. This equates to 3,612 residential units within the Plan period up to 2036.
- 1.2.4 Outside of Fareham, development growth is assumed to continue as 'normal' and in accordance with the adopted Local Plan's for the respective Borough's and in accordance with TEMPro v7.2 growth projections for the modelled areas a whole.
- 1.2.5 Following discussions between FBC and Eastleigh Borough Council, the sites within Eastleigh at Woodhouse Lane, Hedge End (605 dwellings) and Land at Winchester Street, Botley (375 dwellings) are additionally included as committed developments.

Scenario 2 – 2036 Do Minimum *With Full Local Plan Development, Without Mitigation Measures*

1.2.6 The Do Minimum scenario builds on the Scenario 1 2036 Baseline with the addition of the full quantum of proposed development associated to the Fareham Local Plan. Growth

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outside the borough is identical to the Baseline. By comparing the outputs of the Do Minimum scenario with the Baseline, the transport impacts resulting from the Local Plan proposals can be isolated.

Scenario 3 – 2036 Do Something With Full Local Plan Development, With Mitigation Measures

1.2.7 Scenario 3 has incorporated the highway mitigation measures developed by Hampshire Services as part of the Local Junction Mitigation report for the Local Plan. Scenario 3 captures the impact of these interventions in the wider context of the full Borough and surrounding areas.





2. SOLENT TRANSPORT – SUB REGIONAL TRANSPORT MODEL (SRTM) BACKGROUND

2.1 Model Development

- 2.1.1 SYSTRA was commissioned, as part of a wider team, to support Solent Transport with the development and application of the SRTM for this nationally important area. An update to the original 2010 model was completed in early 2017 to bring the base year forward to 2015. In early 2021, a further update was completed to revalidate the model against a 2019 base year.
- **2.1.2** The SRTM has been developed to support a wide-ranging set of interventions across the Solent Transport sub-region, and is specifically required to be capable of:
 - Forecasting changes in travel demand, road traffic, public transport patronage and active mode use over time as a result of changing economic conditions, land-use policies and development, and transport improvement and interventions (schemes);
 - Testing the impacts of land-use and transport policies and strategies within a relatively short model run time; and
 - Testing the impacts of individual transport interventions in the increased detail necessary for preparing submissions for inclusion in funding programmes.

2.2 Sub Regional Transport Model Context and Scope

- 2.2.1 The SRTM is a suite of linked models comprising the following components as shown in Figure 2-1:
 - The Main Demand Model (MDM) which predicts when (time of day), where (destination choice) and how (choice of mode) journeys are made;
 - the Gateway Demand Model (GDM) which predicts demand for travel from ports and airports;
 - the Road Traffic Model (RTM) which determines the routes taken by vehicles through the road network and journey times, accounting for congestion;
 - the Public Transport Model (PTM) which determines routes and services chosen by public transport passengers; and
 - a Local Economic Impact Model (LEIM) which uses inputs including transport costs to forecast the quantum and location of households, populations and jobs.







Figure 2-1 Solent Transport Sub-Regional Transport Model

- 2.2.2 The modelled area of the SRTM is divided into four regions, shown in Figure 2-2, which differ by zone aggregation and modelling detail. Fareham Borough is within the Core Fully Modelled Area (the most detailed region of the model). The zones within the borough are shown in Figure 2-3.
- 2.2.3 In accordance with guidance three weekday periods are modelled in the SRTM:
 - AM peak: busiest hour between 07:00 and 10:00, (defined as 40.5% of the three hours for Highway and 40% for Public Transport);
 - Inter peak: average of 10:00 to 16:00 (i.e. 16.7% of the six hours for both modes); and
 - PM peak: busiest hour between 16:00 and 19:00, (defined as 36.8% of the three hours for Highway and 40% for Public Transport).
- 2.2.4 The SRTM has a base year of 2019, and forecast years of 2026, 2031, 2036, and 2041. For the Fareham Local Plan assessment, scenarios were forecast to 2036.
- 2.2.5 The SRTM is a strategic model and the scope of the model is extensive. As such the analysis of specific localised traffic conditions necessitates a degree of interpretation and a common-sense approach in conjunction with a knowledge of local baseline conditions.







Figure 2-2 SRTM Study Area



Figure 2-3 SRTM Fareham District Zone Structure

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3. FAREHAM MODELLING ASSUMPTIONS

3.1 Introduction

- 3.1.1 This chapter summarises the development of the model scenarios, and their land use, highway and public transport (PT) inputs.
- 3.1.2 The following sections provide a breakdown of the key modelling processes, inputs and outputs. Committed development, and infrastructure information through to 2036 to be used in this study was provided and confirmed by FBC and HCC (the Highway Authority) Officers in June 2021.

3.2 Scenario 1 – 2036 Baseline

Highway and PT network

- 3.2.1 As a starting point, the Baseline scenario uses standard SRTM reference case networks for all modelled years. The SRTM has a base year of 2019 and represents forecast conditions up to the year 2041. Known developments and committed highway schemes are included within the models' reference case scenarios (2026, 2031, 2036 and 2041) to provide the most accurate representation of future year conditions. A list of the committed (funded) highway schemes included in the Reference Case is provided as **Appendix A**.
- 3.2.2 Due to the inclusion of Welborne Garden Village in the Baseline scenario, the associated highway and PT networks have also been represented in this scenario, as agreed with FBC and Hampshire County Council (HCC) the Highway Authority. This includes the addition of the west facing slips at M27 Junction 10, the reconfiguration of Broadway Roundabout (on the A32), and BRT services between Welborne and Fareham rail station.

Non-Fareham Borough Land Use Assumptions

- 3.2.3 In this study, the SRTM Reference Case inputs populate the Baseline scenario for all model areas except Fareham Borough where the Reference Case inputs have been revised as detailed in Section 3.2.6.
- 3.2.4 Within the Reference Case land use (excluding Fareham), in addition to committed sites, "permissible" sites are included. These refer to those locations identified as suitable for future development but that have not yet been subject to planning approval. The locations and maximum land use quantum of the permissible sites are based on the inputs collated up to April 2018 in accordance with adopted Local Plans at that time. The take up of permissible developments is determined by the LEIM module of SRTM and is based on the local conditions (the relative 'attractiveness' of the development, e.g. accessibility).
- 3.2.5 LEIM controls the level of overall development growth within the model in accordance with TEMPro (v7.2) employment and population trajectories for the sub-region which conforms with WebTAG. This is equivalent to allowing for background traffic growth within the modelling process.





Fareham Borough Completions and Committed Development Land Use Assumptions

3.2.6 The starting point in the Baseline for all model data specific to Fareham Borough is to remove all the standard reference case inputs after 2019. In place of these, the actual site completions post-2019 have been added plus hard committed future developments. The total completions and total development, those with permission or resolution to grant, for Fareham Borough are summarised in Table 3-1. Figure 3-1 shows the location of the residential developments within the Borough by model zone.



Figure 3-1 2036 Scenario 1 Baseline – Modelled Residential Growth by model zone for Fareham





Table 3-1 Baseline: Fareham Land Use Inputs 2019 – 2036

	RESIDENTIAL	EMPLOYMENT (SQM)							
	Dwellings	Retail	Office	Industrial	Warehousing	Primary & Secondary Education	Hotel & Other Accommod ation	Healthcare	Leisure
SCENARIO 1 BASELINE (2019 2036 Completions and Committed Developments)	5,715	4,736	33,888	72,099	27,370	0	1,000	3,491	3,819

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3.3 Scenario 2 – 2036 Do Minimum Highway and PT network

3.3.1 All elements of the highway and PT networks remain unchanged between the Baseline and Do Minimum scenarios.

Non-Fareham Borough Land Use Assumptions

3.3.2 In the Do Minimum, the land use outside of the Fareham Borough is the same as in Scenario 1 Baseline. By assessing the Local Plan in this way, there are no changes to the number of households, jobs or population outside of Fareham. By ensuring land use inputs outside of Fareham are unchanged, the impacts of the Local Plan development can be isolated.

Fareham Borough Local Plan Land Use Assumptions

3.3.3 The Fareham Borough Local Plan development allocations are included within the Do Minimum scenario as 'exogenous' development meaning that they will be built in their specified location, regardless of local conditions. The Fareham Local Plan development totals for the Do Minimum scenario are shown in Figure 3-2 and Table 3-2. All totals account for full Local Plan growth (i.e. the totals also include for the Baseline growth).



Figure 3-2 2036 Do Minimum Residential Dwelling growth

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Table 3-2 Do Minimum: Fareham Land Use Assumptions 2019 – 2036 (include for Baseline values)

	RESIDENTIAL		EMPLOYMENT (SQM)						
	Dwellings	Retail	Office	Industrial	Warehousing	Primary & Secondary Education	Hotel & Other Accommod ation	Healthcare	Leisure
SCENARIO 2 DO MINIMUM (2036 Local Plan Development)	11,291	4,736	45,688	182,949	27,370	4,800	1,000	3,491	3,819

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3.4 Scenario 3 – 2036 Do Something

- 3.4.1 The' Do Something' scenario includes the infrastructure measures identified to help mitigate the transport impacts associated to the Fareham Local Plan. The final mitigation sites/measures and selection process are identified in the Local Junction Modelling Report for the Local Plan prepared by Hampshire Services.
- 3.4.2 The Local Junction Modelling Report has been published in Fareham's Local Plan evidence library.

Highway and PT network

- 3.4.3 The Highway network for the Do Something scenario includes changes at 9 junctions within Fareham District in order to mitigate against the impacts of the Fareham Local Plan. The location and type of mitigation are summarised in **Table 3-3** and shown in Figure **3-3**. Preliminary design drawings for each of the schemes can be found in **Appendix E**, and the Linsig and J9 reports may be found in **Appendix F**.
- 3.4.4 It is noted that these mitigation measures are the worst-case mitigation options. The Transport Assessment Addendum will explain the preferred approach to mitigation, which, in line with the emerging Hampshire Local Transport Plan 4, focuses on enabling active travel and public transport measures as a priority. These active travel measures were not modelled in the DS 2036 model as it is not always practical to realistically represent/ model walking and cycling improvements on a site-by-site basis in a strategic model that does not include full representation of all walk links.





	Table	e 3-3 Transport Ne	twork changes in Scenario 3 -	- Do Sometning	
SRTM ID	Junction	Arm	Transport Network Changes	LinSig/J9 report	Drawing
18	A27 The Avenue/Redlands Lane/Gudge Heath Lane	A27 The Avenue (W)	Option 1 - Optimised signal timings	A27 The Ave jct Gudge Heath Lane Fareham Local Plan 2021	A27 jct Gudge Heath Lane as built
28	A27 Southampton Road/Titchfield Hill, Titchfield	Titchfield Hill	Option 2 - 2-lane give way entries	Titchfield Gyratory Option 2 - two lanes give ways	N/A
29	A27 The Avenue/Highlands Road	Highlands Road	Option 1 - optimising signal timings but keeping same stage sequence.	SIG113 A27 Highlands Rd Fareham Local Plan	SIG113 A27 Highlands Rd
30	A27 Southampton Road/Mill Lane, Titchfield	A27 Southampton Road/Mill Lane, Titchfield	Option 1 - optimising signal timings but keeping same stage sequence.	A27 Southampton Rd jct Mill Lane, Titchfield - Existing layout	SIG119 A27 Mill Lane Titchfield - existing
35	A27 Segensworth roundabout/Little Park Farm Road, Segensworth	Little Park Farm Road	Option 4 - Little Park Farm Road entry closed; A27 Southampton Road (W) arm widened to 3 lanes	Segensworth Rbt Option 3 LPFR closed & A27W 3 lanes	N/A
37	Cartwright Drive/Whiteley Lane/Barnes Wallis Road, Segensworth	Cartwright Drive and Whiteley Way (N)	Option 1 - Increase flared lane lengths on Cartwright Drive and Whiteley Way north arms	Whiteley Lane Barnes Wallis Rd Cartwright Dr roundabout mitigation 2 Ianes N&E report	RJ506573-ECH- GEN-14427753- DR-HE-0114- Whiteley Road Rdbt- Cartwright Drive-0114
38	Cartwright Drive/Segensworth Road East	Segensworth Road	Option 6 - Signalised junction with Cartwright Drive southbound and Segensworth Road East widened to two lanes including left turn signal	Cartwright Drive Segs Road - Fareham LP 2021 - recommended option	Cartwright Drive, Segensworth road, Traffic signal option
50	A27 Bridge Road/Coldeast Way/Ironbridge Crescent, Park Gate	A27 Bridge Road (E) and Ironbridge Crescent	Option 2 - on demand pedestrian crossing (every third cycle)	A27 jct Coldeast Way, Sarisbury Green Fareham LP 2021 mitigation	A27 jct Coldeast Way, Sarisbury Green Fareham LP 2021 mitigation
56	A3051 Botley Road/Yew Tree Drive, Whiteley	Yew Tree Drive	Option 1 - Yew Tree Drive widened	Botley Road Yew Tree Drive roundabout mitigation report	Yew Tree Drive- Botley Road Rddt RJ506573- ECH-GEN- 14407918-DR- HE-0112-0112

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3.4.5 It should be noted that where mitigation measures increase capacity, and potentially attract further traffic, the expected reduction in delay from the mitigation may be dampened or absorbed entirely by the impact of the increased traffic volume. In addition, the provision of traffic signals will inherently produce an element of delay due to the red signal periods and for certain traffic movements this may be greater than the scenario without the signals particularly in time periods where capacity or congestion issues are not present/ forecast.



Figure 3-3 Scenario 3 Do Something Junction Mitigation Locations

Land Use Assumptions

3.4.6 Land use assumptions between Scenario 2 Do Minimum and Scenario 3 Do Something are unchanged and the full build-out of the Local Plan is accounted for.





4. LAND USE MODEL RESULTS

4.1.1 This section summarises the outputs of the land use model for the Baseline and Do Minimum scenarios. As noted in section 3.4.6, the land use for the Do Something is identical to the Do Minimum.

4.2 Population, Dwellings, Jobs (LEIM Module Outputs)

- 4.2.1 Table 4-1 summarises the forecasts produced by the LEIM module of the SRTM, for the population, number of dwellings, and number of jobs within the Fareham Borough. In the table, the 2036 Do Minimum scenario has been compared against the 2036 Baseline scenario.
- 4.2.2 Table 4-1 shows how Scenario 2 (DM) compares to Scenario 1 (Baseline) in 2036. The Local Plan proposes an increase of approximately 5,600 households between 2019 and 2036. The additional employment land use included in the local plan provides approximately 5,600 jobs in the borough during the same period.

	2036 SCENARIO 1 BASELINE	2036 SCENARIO 2 DO MINIMUM OPTION 1	DIFFERENCE	% DIFFERENCE
Population	127,534	139,813	12,278	9%
Dwellings	59,045	64,621	5,576	9%
Jobs	64,986	70,545	5,559	8%

Table 4-1 Change in LEIM outputs in Fareham, 2036 DM vs 2036 Baseline





5. MAIN DEMAND MODEL RESULTS

5.1 Introduction

5.1.1 This section summarises the forecasts produced by the MDM module of the SRTM for Scenarios 1 (Baseline), 2 (Do Minimum) and 3 (Do Something) as well as their difference in order to isolate the impacts of the Local Plan development.

5.2 Main Demand Model (MDM) Results

- 5.2.1 The total person trips, and percentage mode share to, and from, Fareham Borough for a 24-hour period are summarised in Table 5-1.
- 5.2.2 Table 5-1 shows the trip generation associated directly to the Local Plan (Do Minimum scenario) against the 2036 Baseline. The Do Minimum scenario includes for an approximate increase of 5,600 dwellings within Fareham when compared to the Baseline. This is reflected in the number of person trips to / from and within Fareham over a 24-hour period.
- 5.2.3 The mode share across the 2036 Do Minimum scenarios remains similar to the 2036 Baseline. There are small increases in active mode share due to a more congested highway network in the Do Minimum scenario.

	COENIADIO	FRO	M FAREHA	M	TO FAREHAM		
	SCENARIO	HIGHWAY	РТ	ACTIVE	HIGHWAY	РТ	ACTIVE
ш	2036 Scenario 1 Baseline	321,442	12,559	62,831	323,532	12,797	62,724
BSOLUT	2036 Scenario 2 Do Minimum	344,482	14,483	71,699	345,860	14,700	71,574
٩	Difference (DM – Baseline)	23,040	1,924	8,868	22,328	1,903	8,850
E (%)	2036 Scenario 1 Baseline	81%	3%	16%	81%	3%	16%
DE SHARF	2036 Scenario 2 Do Minimum	80%	3%	17%	80%	3%	17%
MOE	Difference (DM – Baseline)	-1%	0%	1%	-1%	0%	1%

Table 5-1 Person Trips (24h) to / from Fareham – 2036 DM vs. 2036 Baseline

5.2.4

Table 5-2 shows the trip generation associated directly to the Local Plan with Mitigation measures (Do Something scenario) against the 2036 Do Minimum. The Do Something and Do Minimum scenario includes the same number of additional dwellings within Fareham when compared to the Baseline.

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5.2.5

The mode share across the 2036 Do Something scenarios remains similar to the 2036 Do Minimum. All mode share changes between the Do Something and Do Minimum scenarios are less than 0.05%.

	SCENARIO	FRO	M FAREHA	М	TO FAREHAM			
	SCENARIO	HIGHWAY	РТ	ACTIVE	HIGHWAY	РТ	ACTIVE	
	2036 Scenario 1 Baseline	321,442	12,559	62,831	323,532	12,797	62,724	
LUTE	2036 Scenario 2 Do Minimum	344,482	14,483	71,699	345,860	14,700	71,574	
ABSO	2036 Scenario 3 Do Something	344,221	14,507	71,772	345,479	14,712	71,639	
	Difference (DS – DM)	-261	25	73	-381	12	65	
	2036 Scenario 1 Baseline	81%	3%	16%	81%	3%	16%	
IARE (%)	2036 Scenario 2 Do Minimum	80%	3%	17%	80%	3%	17%	
MODE SH	2036 Scenario 3 Do Something	80%	3%	17%	80%	3%	17%	
	Difference (DS – DM)	-0.03%	0.01%	0.02%	-0.03%	0.01%	0.03%	

Table 5-2 Person Trips (24h) to / from Fareham – 2036 DS vs. 2036 DM





6. HIGHWAY MODEL RESULTS

6.1 Introduction

- 6.1.1 This section summarises the highway outputs across the Fareham Borough as a whole for the following Scenarios:
 - 2036 Scenario 2 Do Minimum vs. 2036 Scenario 1 Baseline;
 - 2036 Scenario 3 Do Something vs 2036 Scenario 2 Do Minimum.
- 6.1.2 For each comparison, four aspects of the model have been reviewed.

Highway Network Performance

6.1.3 The key network statistics for the full SRTM core study area have been summarised, including vehicle hours, vehicle kilometres, and average speed. Due to the size of the SRTM, the results for the Fareham Borough in isolation have also been provided.

Highway Link Flows, Delays and Capacity Hotspots (Road Traffic Model Module outputs)

- 6.1.4 The outputs of the Road Traffic Model (RTM) have been analysed with respect to highway link flow, delay and capacity. For clarity, the outputs shown are for those which exceed a given threshold which is specified in the following appropriate paragraphs. The plots included in the report, are an overview of the Fareham Borough with more localised plots being provided in the relevant appendices.
- 6.1.5 In addition to the new traffic directly associated with the land use, these plots highlight any re-routing of traffic that may result from localised congestion or redistribution of existing trips. These plots identify where the net change to traffic flow is most pronounced.

Change in Traffic Flow

6.1.6 For the flow difference plots the absolute difference in passenger car units (PCUs) is identified adjacent to the appropriate link. Blue lines identify a reduction against the comparative scenario and pink/red lines an increase. In addition, the scale of the change is represented graphically with the coloured lines of varying bandwidth. Only flow differences of 25 PCUs or greater are displayed in the plots. Plots showing more localised areas are in **Appendix B**.

Highway Delay

6.1.7 The absolute difference in delay in seconds per PCU is identified adjacent to the appropriate link. Blue lines identify a reduction and pink/red lines an increase. In addition, the scale of the change is represented graphically with the coloured lines of varying bandwidth. All delay differences in excess of 5 seconds are displayed in the plots. More localised plots are provided in **Appendix C**.





Capacity Hotspots

- 6.1.8 In order to identify locations with potential capacity issues as a result of proposed Local Plan allocations, the operating capacity on all links on the approaches to junctions within the Fareham Borough have been assessed. Junction approaches have been reviewed based on the ratio of flow to capacity (RFC) (also known as volume vs capacity or V/C) on each approach hence identifying links with a high RFC is a proxy for identifying junctions with capacity issues.
- 6.1.9 The following criteria has been used to identify junctions where future highway schemes may be required, for each scenario tested:
 - Links where the RFC is greater than 80% in either AM or PM peak hour.
- 6.1.10 If the RFC is near, or in excess of 90%, then the junction may be subject to queuing and delays; a value of 90% is normally taken as the practical capacity value for design purposes. A value of >100% means that the junction is forecast over capacity and significant queues and delay could occur.
- 6.1.11 In peak hours, it is not unexpected that a relatively high number of junctions have an RFC in excess of 80%. The analysis has been refined further to identify the junctions potentially impacted the most.
- 6.1.12 The change in RFC and delay between the scenarios has been calculated to identify locations where the forecast highway network performance deterioration is most pronounced in terms of junction performance. The following criteria has been applied to identify junctions where operational performance worsens either significantly or severely (these criteria have been used on similar SRTM commissions in agreement with HCC, the Highway Authority):
 - 'Significant' increase in RFC is where the RFC is greater than 85% and has increased by more than 5% on any approach arm; and
 - 'Severe' increase in RFC is where the RFC is greater than 95% and has increased by more than 10%, or where delay is greater than 120 seconds and has increased by more than 60 seconds on any approach arm.
- 6.1.13 It should be noted that the above criteria are not the only measure by which junction/ network performance or scale of impact associated to transport growth can be classified. They are considered a starting point (consistent with other SRTM commissions) for comparison of network performance from which subsequent more detailed assessment may refine those locations considered most impacted.
- 6.1.14 A detailed list of junction performance for each comparison is provided in **Appendix D**.





6.2 2036 Scenario 2 Do Minimum vs. 2036 Scenario 1 Baseline

Highway Network Performance

- 6.2.1 The performance of the highway network for the AM and PM periods for 2036 Scenario 1 Baseline, and 2036 Scenario 2 Do Minimum is shown in Table 6-1 and Table 6-2. The highway traffic growth within Fareham, arising from the introduction of the Local Plan allocations, generates a forecast increase in vehicle hours of 8.45% in the AM and 6.90% in the PM. Vehicle kilometres are forecast to increase by approximately 2% in the AM Peak and 2.50% in the PM Peak, whilst average speed is forecast to decrease by 6% and 4% in the AM and PM peaks respectively due to the increased network delay.
- 6.2.2 The impact on the full Core model area is considered negligible as land use changes between the scenarios are focussed solely on Fareham District.

		BASELINE 2036	DM 2036	DIFFERENCE	% DIFFERENCE
Vehicle	Core Model Area	171,550	173,338	1,788	1.04%
Hours	Fareham	18,439	19,998	1,559	8.45%
Vehicle	Core Model Area	6,887,990	6,906,598	18,608	0.27%
kms	Fareham	720,828	735,108	14,280	1.98%
Average	Core Model Area	40.2	39.8	-0.31	-0.76%
Speed (kph)	Fareham	39.1	36.8	-2.33	-5.97%

Table 6-1 AM Highway Model Statistics, 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline

Table 6-2 PM Highway Model Statistics, 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline

		BASELINE 2036	DM 2036	DIFFERENCE	% DIFFERENCE
Vehicle	Core Model Area	181,909	183,610	1,701	0.94%
Hours	Fareham	18,473	19,747	1,274	6.90%
Vehicle	Core Model Area	7,515,034	7,540,217	25,183	0.34%
kms	Fareham	785,928	805,044	19,116	2.43%
Average	Core Model Area	41.3	41.1	-0.25	-0.59%
Speed (kph)	Fareham	42.5	40.8	-1.78	-4.18%

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Highway Link Flows, Delays and Capacity Hotspots (RTM Module outputs)

Change in Traffic Flow

- 6.2.3 Figure 6-1 and Figure 6-2 identify the change in traffic flow in the AM and PM peak hours between the 2036 Scenario 2 Do Minimum and 2036 Scenario 1 Baseline scenarios, at an overall borough level.
- 6.2.4 The greatest changes in actual flows are south of the Peel Common Roundabout in the 2036 Scenario 2 Do Minimum AM Peak, with increase in flows of up to 246 PCUs in the southbound circulatory arm. There has also been an increase of around 160 PCUs in the southbound direction of the Stubbington Bypass in the same period due to traffic going towards the Daedalus Access. An increase of 148 PCUs is experienced in the eastbound approach to the Longfield Avenue / Bishopsfield Road.
- 6.2.5 Another location with a significant increase of around 115 PCUs in both directions in the AM Peak is Whiteley Lane, with the Whiteley Lane / Barnes Wallis Road roundabout being one of the severely impacted junctions in the 2036 Scenario 2 Do Minimum when compared with the 2036 Scenario 1 Baseline.
- 6.2.6 In the AM Peak, there has been a significant decrease of 284 PCUs in the Segensworth Road East, on the westbound approach to the Cartwright Drive / Segensworth Road East junction. An increase in flows is experienced along the Cartwright Drive suggesting that some traffic rerouted to this road. There has also been a decrease of 151 PCUs in the A27 Southampton Road near Segensworth Roundabout, likely due to the delays experienced on the westbound approach as will be discussed in the next section.
- 6.2.7 In the 2036 Scenario 2 Do Minimum PM Peak, the greatest changes in actual flows are along the B3385 Newgate Lane East as a result of traffic leaving the Daedalus Access, with increase in flows of up to 150 PCUs. There has also been a significant increase in flows in the A27 Southampton Road with an increase of 220 PCUs in the southbound direction, near the severely impacted Segensworth Roundabout.
- 6.2.8 There has been a significant decrease of 131 PCUs in the northbound approach of the Segensworth Roundabout in the PM Peak. There has also been a decrease of 74 PCUs on the High Street southbound approach to the High Street / East Street junction near the Delme Roundabout, with a similar increase on Osborn Road also suggesting rerouting happened.
- 6.2.9 The Daedalus Access at the border of Fareham and Gosport, located on the B3385 Broom Way / Cherque Way also presents a great increase in flows. There is an increase of 96 PCUs and 300 PCUs on the eastbound approach in the AM and PM Peak, respectively, compared to 2036 Scenario 1 Baseline. Similarly, there is an increase in the southbound approach of 246 PCUs and 74 PCUs in the AM and PM Peak, respectively. This is mainly due to the additional industrial land use of around 65,000 sqm.
- 6.2.10 In the areas of Locks Heath, Stubbington and Portchester there are no major changes in flow differences between the two scenarios other than where traffic is joining the network from the new housing development sites. The magnitude of flow difference, beyond the zone connectors, is not more than +/-100 PCUs in either direction.

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Figure 6-1 Flow Difference – 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline (AM)

(SRTM Ref: FKP vs. FKN)

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Figure 6-2 Flow Difference – 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline (PM)

(SRTM Ref: FKP vs. FKN)

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Highway Delays

- 6.2.11 Figure 6-3 and Figure 6-4 display the forecast change in link delay, per PCU, for the AM and PM peak hours between the 2036 Scenario 2 Do Minimum and 2036 Scenario 1 Baseline.
- 6.2.12 The greatest increases in delays comparing the 2036 Scenario 2 Do Minimum with the 2036 Scenario 1 Baseline are situated on the Segensworth Roundabout in the AM Peak. The increase in delays on the westbound approach from Segensworth Road is 192 seconds, whilst the southbound circulatory arm has an increase in delays of 216 seconds. Another significant increase of 97 seconds is on the westbound approach to the Cartwright Drive / Segensworth Road East junction. Other significant increases in delays of around 60 seconds are located around the Titchfield Gyratory, B3385 Newgate Lane / Longfield Avenue, and on the A3051 Botley Road / Rookery Avenue junctions.
- 6.2.13 In the 2036 Scenario 2 Do Minimum compared with the 2036 Scenario 1 Baseline PM Peak, the greatest increase in delays happens in the northbound approach of the Warsash Road / Little Abshot Road mini-roundabout. Another great increase in delay of nearly 60 seconds happens in the northbound approach of the A27 The Avenue / Redlands Lane junction. Significant increases in delays of around 45 seconds also happen at the Barnes Wallis Road / Whiteley Lane north mini-roundabout and at the A3051 Botley Road / Yew Tree Drive roundabout.
- 6.2.14 In the areas of Locks Heath, Stubbington and Portchester there are no major changes in delay differences between the two scenarios other than where discussed previously. The magnitude of delay difference is usually not more than +/-10 seconds in either direction.
- 6.2.15 Within the Fareham District area the biggest forecast decrease in delay of 48 seconds in the AM Peak is observed on Leafy Lane on the northbound approach to the Leafy Lane / Parkway junction near the M27 J9. There has also been a decrease of 34 seconds on the northbound approach on the A27 Bridge Road / Hunts Pond Road / A3051 Botley Road junction, and a decrease of 18 seconds in the eastbound approach to the A27 The Avenue / Catisfield Road junction. There were no significant decreases in delays in the PM Peak. These decreases in delays are likely due to traffic rerouting in the highway network as there have been increases in actual flows on neighbouring routes.







Figure 6-3 Delay Difference – 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline (AM)

(SRTM Ref: FKP vs. FKN)

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Figure 6-4 Delay Difference – 2036 Scenario 2 DM vs. 2036 Scenario 1 Baseline (PM)

(SRTM Ref: FKP vs. FKN)

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Capacity Hotspots

- 6.2.16 Figure 6-5 and Figure 6-6 display the junctions forecast to have an RFC greater than 80% in the 2036 Scenario 1 Baseline and 2036 Scenario 2 Do Minimum respectively in any time period. 62 junctions meet this criterion in the 2036 Scenario 1 Baseline, with the 2036 Scenario 2 Do Minimum forecast to have 65 junctions meeting the criteria.
- 6.2.17 Junction 55 (Sweethills Crescent / Yew Tre Drive Roundabout) had RFC greater than 80% in the 2036 Scenario 1 Baseline but not in the 2036 Scenario 2 Do Minimum, whilst 4 junctions (Junctions 63-66) had RFC greater than 80% in the 2036 Scenario 2 Do Minimum compared to the 2036 Scenario 1 Baseline, these are:
 - Junction 63: Lockswood Road / Centre Way;
 - Junction 64: Barnes Wallis Road / Brunel Way;
 - Junction 65: Highlands Road / Fareham Park Road;
 - Junction 66: Lower Church Road / Hunts Pond Road Roundabout (northern mini roundabout).
- 6.2.18 Further to the analysis identifying those junctions with V/C in excess of 80% in the 2036 Scenario 1 Baseline and 2036 Scenario 2 Do Minimum scenarios, we have applied the threshold detailed in Section 6.1.12 to identify those junctions within Fareham District most impacted by highway growth between both scenarios.
- 6.2.19 Applying the criteria set-out in Section 6.1.12, there are a total of 8 junctions that meet the 'severe' change criteria and 11 are classified as 'significant' as summarised in the locations shown in Figure 6-7, and Table 6-3.
- 6.2.20 It can be seen that of those junctions forecast to experience significant increases in RFC or delays, many of them are situated along the A27 Southampton Road and A27 Bridge Road.







Figure 6-5 Junctions Forecast to have an RFC >80% in 2036 Scenario 1 Baseline

(SRTM Ref: FKN)

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Figure 6-6 Junctions Forecast to have an RFC >80% in 2036 Scenario 2 DM

(SRTM Ref: FKP)

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Figure 6-7 2036 Do Minimum vs 2036 Baseline Impacted Junction Locations

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ID	JUNCTION NAME	'SIGNIFICANTLY' IMPACTED	'SEVERELY' IMPACTED
4	A32 Gosport Road / Newgate Lane	Y	
10	A32 / High Street / Wallington Way	Y	
15	Station Roundabout	Y	
18	A27 The Avenue / Redlands Lane / Gudge Heath Lane		Y
20	Longfield Avenue / Newgate Lane	Y	
24	B3334 Titchfield Road / Bridge Street		Y
28	Titchfield Gyratory	Y	
29	A27 The Avenue / Highlands Road	Y	
30	A27 Southampton Road / Mill Lane	Y	
31	Coach Hill/South Street/Bridge Street		Y
35	Segensworth Roundabout		Y
37	Barnes Wallis Road / Whiteley Lane / Cartwright Drive		Y
38	Segensworth Road East/Carwright Drive		Y
39	Southampton Road / Telford Way Roundabout		Y
50	A27 Bridge Road / Coldeast Way	Y	
56	Sweethills Crescent / Yew Tree Drive	Y	
57	Bridge Road/Swanwick Lane	Y	
58	A27 Bridge Road/Barnes Lane		Y
65	Highlands Road / Fareham Park Road	Y	

Table 6-3 2036 Do Minimum vs 2036 Baseline Impacted Junction List





6.3 2036 Scenario 3 Do Something vs. 2036 Scenario 2 Do Minimum

Highway Network Performance

- 6.3.1 The performance of the highway network for the AM and PM periods for 2036 Scenario 1 Baseline, 2036 Scenario 2 Do Minimum and Scenario 3 Do Something is shown in Table 6-4 and Table 6-5. The difference between the Do Something and Do Minimum values is also tabulated.
- 6.3.2 In terms of network performance statistics, the mitigation included in Scenario 3 Do Something has had a greater impact in the AM peak. The number of vehicle hours within Fareham has reduced by nearly 2% in the AM peak when comparing DS with DM scenarios, but is largely unchanged in the PM peak. By contrast, the number of vehicle kms has increased by almost 1% and 0.5% in the AM and PM peak, respectively. The average speed has also increased by around 2.5% in the AM peak, and remained virtually unchanged in the PM peak.
- 6.3.3 A general increase in Vehicle Kilometres, reduction in Vehicle Hours, and increase in vehicle speed is consistent with the inclusion of mitigation as bottleneck and delay issues are addressed.

		BASELINE 2036	DM 2036	DS 2036	DIFFERENCE (DS vs DM)	% DIFFERENCE
Vehicle	Core Model Area	171,550	173,338	173,338	- 0	0.00%
Hours	Fareham	18,439	19,998	19,637	- 361	-1.81%
Vehicle	Core Model Area	6,887,990	6,906,598	6,912,591	5,992	0.09%
Kms	Fareham	720,828	735,108	740,726	5,617	0.76%
Average Speed (kph)	Core Model Area	40.2	39.8	39.9	0.03	0.09%
	Fareham	39.1	36.8	37.7	0.96	2.62%

Table 6-4 AM Highway Model Statistics, 2036 Scenario 3 DS vs. 2036 Scenario 2 Do Minimum

Table 6-5 PM Highway Model Statistics, 2036 Scenario 3 DS vs. 2036 Scenario 2 Do Minimum

		BASELINE 2036	DM 2036	DS 2036	DIFFERENCE (DS vs DM)	% DIFFERENCE
Vehicle	Core Model Area	181,909	183,610	183,505	- 105	-0.06%
Hours	Fareham	18,473	19,747	19,795	49	0.25%
Vehicle	Core Model Area	7,515,034	7,540,217	7,542,436	2,219	0.03%
Kms	Fareham	785,928	805,044	808,335	3,291	0.41%

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Average	Core Model Area	41.3	41.1	41.1	0.04	0.09%
(kph)	Fareham	42.5	40.8	40.8	0.07	0.16%

Highway Link Flows, Delays and Capacity Hotspots (RTM Module outputs)

Change in Traffic Flow and Delay

- 6.3.4 Figure 6-8 and Figure 6-9 identify the change in traffic flow in the AM and PM peak hours, respectively, between the 2036 Scenario 3 Do Something and 2036 Scenario 2 Do Minimum, at an overall borough level. Figure 6-3 and Figure 6-4 identify the delay difference per PCU between the two scenarios. The forecast flow and delay changes are described altogether in this section because the impacts between the two are linked.
- 6.3.5 The paragraphs that follow focus on the 9 locations where it is proposed that highway mitigation is tested, plus any other notable flow/delay changes. As agreed with the Highway Authority, these mitigation measures are presented as worst-case options; active travel and public transport solutions should be sought first.

Junction 18 - A27 The Avenue/Redlands Lane/Gudge Heath Lane

- 6.3.6 This is a four-arm traffic signal junction located to the west of Fareham town centre, with the A27 The Avenue being the main road running west-east. As part of the Local Junction Modelling Report 2021, it was recommended that the signal timings were optimised at this junction using Linsig3 software. These new signal timings were tested in the Scenario 3 DS 2036 run.
- 6.3.7 Comparing Scenario 3 DS 2036 against the Scenario 2 DM 2036 run, there were generally minor reductions in traffic flows on all arms in both peaks, except Gudge Heath Lane which experienced an increase of 110 pcus in the AM peak. The greatest reduction in traffic flows was of 74 pcus at the A27 The Avenue (W) approach arm.
- 6.3.8 There were delay decreases of up to 15 seconds in the AM peak on Redlands Lane, and there was an increase of 11 seconds in the PM peak. Despite being a relatively minor delay increase in the PM peak, this has now triggered the 'severely' impacted under the delay criterion when comparing Scenario 3 DS 2036 against Scenario 1 Baseline 2036.
- 6.3.9 Even though there was a traffic flow increase in the AM peak, both time periods now experience less delay on the Gudge Heath Lane approach, with reductions of 82 seconds in the AM peak and 17 seconds in the PM peak.
- 6.3.10 This suggests that the signal timings might be unbalanced towards Gudge Heath Lane, and the junction signal timings might benefit from re-optimisation using Linsig3 software using the new traffic flows.

Junction 28 - A27 Southampton Road/Titchfield Hill, Titchfield

6.3.11 The junction is currently undergoing significant changes to its layout as part of the Stubbington Bypass scheme. The link between A27 west and B3334 Titchfield Road is being re-routed directly through the centre of the gyratory. This will be a 2-lane link which

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will be signal controlled together with the B3334 Titchfield Road entry. The B3334 Titchfield Road arm is being widened to 2 lanes in both directions. The existing eastern end of the gyratory will be removed. The layout of the Titchfield Hill arm is a two-lane entry which has individual lanes for left turning and ahead traffic. The western side of the gyratory is a wide single lane give way which joins the A27 eastbound. These arms will remain unchanged by the Stubbington bypass scheme.

- 6.3.12 The Fareham Local Plan Local Junction Modelling Report 2021 recommended that "Option 2 two-lane give way entries" was tested in the SRTM Scenario 3 Do Something run. The main changes to the gyratory in Option 2 when comparing with the scheme currently under construction are the lane designations on Titchfield Hill entry arm, and the creation of 2 lanes downstream on the gyratory (west side of gyratory). The report also suggests that with these measures, the gyratory would operate just within capacity using the Scenario 2 DM 2036 flows, for both AM and PM peaks.
- 6.3.13 Whilst it was expected that this junction would operate within capacity using the DM flows, it is also expected that the mitigation measures would generate rerouting across the highway network due to some routes becoming more attractive than others. This is the case with Titchfield Gyratory, where the increase in capacity and signal timing optimisation have led to an increase of up to 144 pcus in the AM peak on the B334 Titchfield Road approach arm, and 90 pcus in the PM peak on the Titchfield Hill approach.
- 6.3.14 Concerning delay differences between Scenario 3 DS and Scenario 2 DM, there has been a delay reduction across all arms in the AM peak except the A27 The Avenue approach arm with a delay increase of 11 seconds. Similar delay reductions were experienced in the PM peak, except the B334 Titchfield Road arm which had a delay increase of 36 seconds. The maximum delay reduction was of 91 seconds and 27 seconds in the Titchfield Hill arm in the AM and PM peak, respectively.

Junction 29 - A27 The Avenue/Highlands Road

- 6.3.15 The Fareham Local Plan Local Junction Modelling Report 2021 recommended that the existing signal stage configuration was kept, but with green times optimised to the traffic flows generated by the Scenario 2 DM 2036.
- 6.3.16 As a result of the mitigation measures proposed in the Scenario 3 DS 2036, the actual flows reduced by around 30 pcus in both Highlands Road and A27 The Avenue (W), and increased by 75 pcus in the A27 The Avenue (E) for the AM peak. There were minor increases in delay up to 12 seconds in all arms in the same time period.
- 6.3.17 Comparatively, in the PM peak, there were an additional 62 and 9 pcus on the A27 The Avenue (E) and A27 The Avenue (W), respectively. On the other hand, there was a decrease of 90 pcus on Highlands Road. Delays have also increased in this junction by 26 seconds in the Highlands Road approach.

Junction 30 - A27 Southampton Road/Mill Lane, Titchfield

6.3.18 The proposed scheme at Junction 30 was to optimise the signal timings using the same junction layout and signal staging operation. From the local junction modelling this was expected to provide about 2.2% spare capacity in the Scenario 2 DM 2036. However, due to flow reassignment as a result of optimised signal timings there have been large flow

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increases at this junction in the Scenario 3 DS 2036 run. There are now an additional of 506 pcus using the A27 Southampton Road (E), and 106 pcus using Mill Lane in the AM peak. Despite these increases, the delay difference is small, with less than 15 seconds difference in all arms in the same time period.

- 6.3.19 For the PM peak, there are now an additional of 170 pcus and 102 pcus on A27 Southampton Road (E) and Mill Lane approach arms, respectively. The delay increases are less than 30 seconds. Traffic flows on the A27 Southampton Road (W) have decreased by 95 pcus.
- 6.3.20 The increase in traffic flows in the AM and PM peaks may not be attributed to one isolated factor. For the AM peak, it can be inferred that rerouting has happened due to traffic flow decreases on adjacent routes such as Catisfield Road (WB) and Titchfield Hill (WB). Also, based on Select Link Analysis of both DM and DS model runs, the maximum increase of traffic flows in the WB direction may be attributed to A27 The Avenue (E) and B3334 Titchfield Road. For the PM peak, Select Link Analysis shows that the increase in traffic on the A27 Southampton Road (E) is due to more traffic coming from Highlands Road and A27 The Avenue (E). There has been a similar decrease in River Lane and Fontley Road, suggesting that westbound traffic was rerouted from there to the A27.

Junction 35 - A27 Segensworth roundabout/Little Park Farm Road, Segensworth

- 6.3.21 The proposed scheme at Segensworth Roundabout was Option 4 of the Fareham Local Plan Local Junction Modelling Report 2021. This included the closure of the Little Park Farm Road entry arm, and the A27 Southampton Road (W) arm widened to 3 lanes. The existing signal timings were also optimised to take into account these highway network changes. Despite these mitigation measures, it was still expected that 3 arms, namely M27 link road, A27 Southampton Rd (S), and Circulatory (W), would be at or over capacity with the Scenario 2 DM 2036 flows in the Local Modelling Report.
- 6.3.22 In line with the local junction modelling report, Scenario 3 DS 2036 shows that the traffic flows using Little Park Farm Road in Scenario 2 DM 2036 have been rerouted to the A27 Southampton Road (W) via Telford Way for both time periods. There has been an increase of over 500 pcus and 350 pcus on the A27 Southampton Road (W) arm, for AM and PM peak, respectively.
- 6.3.23 In the Scenario 2 DM 2036 scenario, both Little Park Farm Rd and Segensworth Rd arms were flagged in the AM peak as severe due to the delay criterion. In the Scenario 3 DS 2036 run, there were no arms flagged as significantly or severely impacted under the delay criterion, when compared with the Scenario 1 Baseline 2036.
- 6.3.24 Delay has decreased significantly across all arms of the roundabout except the west circulatory movement, with reductions of around 200 seconds in the AM peak. No significant changes in delay have happened in the PM peak. However, in both time periods, congestion has built up on Telford Way, with delay increases of around 500 seconds. It is suggested that the A27 Southampton Rd / Telford Way junction is mitigated separately, to reduce the impacts from the Little Park Farm Rd entry arm close.





Junction 37 - Cartwright Drive/Whiteley Lane/Barnes Wallis Road, Segensworth

- 6.3.25 Increased flared lane lengths on Cartwright Drive and Whiteley Way north arms were the main recommendations for Junction 37 as part of the Local Junction Modelling Report 2021. The new layout for this junction has been included in Appendix E. Despite these measures, the same report estimated that the Barnes Wallis Road arm would still be over capacity in the PM peak, using the Scenario 2 DM 2036 flows.
- 6.3.26 There was an increase of nearly 500 pcus on the Cartwright Drive arm in the Scenario 3 DS 2036 compared to the Scenario 2 DM 2036 flows, for the AM peak. This is mainly due to traffic rerouting from the A27 Southampton Road in the northbound direction, to Cartwright Drive, at the St Margaret's Roundabout. On the other hand, there was a decrease of around 70 pcus on Whiteley Lane arm, in the same time period. There were no significant changes on the other arms in the AM peak.
- 6.3.27 In the PM peak, there was an increase of almost 700 pcus in the Whiteley Lane (N) arm. A few select link analysis around the area show that most of the traffic is coming from a loading zone near Solent Village, and part of this traffic is coming from the M27 which is being routed through Parkway South Roundabout. These results suggests that this route has become more attractive to some trips in comparison with the route via Segensworth Roundabout. On the other hand, there were traffic flows decreases of 100 pcus and 50 pcus, in Cartwright Drive and Barnes Wallis Road, respectively.
- 6.3.28 Despite the traffic flow increases in certain arms, there were reductions in delays across all arms in the AM and PM peaks, especially in the Cartwright Drive arm, which experienced a reduction of over 120 seconds in the AM peak, and in the Whiteley Lane arm, with a reduction of around 320 seconds in the PM peak.

Junction 38 - Cartwright Drive/Segensworth Road East

- 6.3.29 The proposed scheme at Junction 38 includes transforming this three-arm priority T junction into a signalised junction with Cartwright Drive southbound and Segensworth Road East widened to two lanes including a left-turn signal. The Fareham Local Plan Local Junction Modelling Report 2021 estimates that this junction would operate with spare capacity using the Scenario 2 DM 2036 flows.
- 6.3.30 As a result of these mitigation measures, there were very high traffic flow increases, especially on the Cartwright Drive (S) in the AM peak, which now has nearly 400 extra pcus in the Scenario 3 DS 2036 compared to Scenario 2 DM 2036. There was also an increase of almost 40 pcus in the Cartwright Drive (N) arm, and around 70 pcus in the Segensworth Road East. Despite these flow increases, there were no significant increases in delays, with the maximum change being at Cartwright Drive (S) which now experiences almost 40 seconds of additional delay.
- 6.3.31 For the PM peak, there was an increase of 250 pcus on Cartwright Drive (N) and a decrease of nearly 300 pcus in the Segensworth Road East. Despite the decrease of flows on Segensworth Road East, there was delay increase of around 40 seconds. This suggests that the signal timings might be unbalanced with the Scenario 3 DS 2036 flows, and could benefit from being re-optimised.





6.3.32 These traffic flow changes are in line with nearby Junction 37, and it suggests that extra capacity was unlocked in this route which is now more attractive than other adjacent routes.

Junction 50 - A27 Bridge Road/Coldeast Way/Ironbridge Crescent, Park Gate

- 6.3.33 The Fareham Local Plan Local Junction Modelling Report 2021 recommends Option 2 for Junction 50, which replaces the existing uncontrolled pedestrian crossings, including central refuges, with on-demand controlled crossings on the A27 east and Ironbridge Crescent arms. In this option, there is a westbound right-turn lane on the A27 arm, and the widening of the Ironbridge Crescent. It is considered in the Local Junction modelling report that the on-demand pedestrian signals would be called every other third cycle, and with the other measures, the junction would operate just within capacity.
- 6.3.34 In the Scenario 3 DS 2036, there was a decrease of around 60 pcus on the A27 Bridge Road (W) in the AM peak, and an increase of 26 pcus on the same arm in the PM peak. There was also a decrease of nearly 40 pcus in the A27 Bridge Road (E) in the PM peak.
- 6.3.35 Despite the flow increase in some arms, there were no significant changes in delay, with all of them being less than 20 seconds in all time periods.

Junction 56 - A3051 Botley Road/Yew Tree Drive, Whiteley

- 6.3.36 It was proposed in the Fareham Local Plan Local Junction Modelling Report 2021 that Option 1 should be tested in the Scenario 3 DS 2036 run. This option includes widening the Yew Tree Drive arm to improve its capacity, with a provision of two lanes for around 20 metres back from the give way line. The nearside lane would be used by traffic turning left to travel south along Botley Road and the offside lane by those turning right to travel northwards. The junction layout may be found in Appendix E.
- 6.3.37 There were increases in traffic flows in all arms in both time periods in Scenario 3 DS 2036 when compared to Scenario 2 DM 2036, with the most significant increases being around 50 pcus in both the Yew Tree Drive (W) and Yew Tree Drive (E) arms in the AM peak, and 150 pcus and 250 pcus in the Yew Tree Drive (W) and Yew Tree Drive (E) arms in the PM peak, respectively.
- 6.3.38 Despite the flow increases in all arms, there were no delay changes in the AM peak, and there were delay reductions of up to 60 seconds in the PM peak, on the Yew Tree Drive (E) arm.







Figure 6-8 Flow Difference - 2036 Scenario 3 DS vs 2036 Scenario 2 DM (AM)

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Figure 6-9 Flow Difference - 2036 Scenario 3 DS vs 2036 Scenario 2 DM (PM)

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Figure 6-10 Delay Difference - 2036 Scenario 3 DS vs 2036 Scenario 2 DM (AM)

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Figure 6-11 Delay Difference - 2036 Scenario 3 DS vs 2036 Scenario 2 DM (PM)

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Capacity Hotspots

- 6.3.39 Figure 6-12 displays the junctions forecast to have an RFC greater than 80% in the 2036 Scenario 3 Do Something. Junctions with an RFC greater than 80% are considered to be operating close to, or at capacity. The Do Something scenario is forecast to have 62 junctions meeting this criterion. This represents a reduction from 65 junctions in the Do Minimum and is the same number reported for the Baseline, albeit representing different junctions.
- 6.3.40 Applying the criteria set out in Section 6.1.12, there is a total of 9 junctions that meet the 'significant' change criteria and 14 junctions meeting the 'severe' change criteria when compared against the Baseline. This represents a decrease of 2 'significant' locations compared to the Do Minimum, and an increase in 6 'severe' locations. The junction locations are shown in Figure 6-13 and listed in Table 6-6. There are 9 junctions not previously identified as having 'significant' or 'severe' impacts in the Do Minimum and these are highlighted in Table 6-6.
- 6.3.41 New junctions triggering one of the 'significant' or 'severe' criteria are not entirely unexpected due to the mitigation measures incorporated potentially releasing bottlenecks that then impact downstream locations, or changing the assignment of vehicles through the network.
- 6.3.42 The sections below summarise the performance of the mitigated junctions in the Do Something model run, and highlight the 9 additional junctions with impact classified as 'significant' or 'severe'.

Junction 18 - A27 The Avenue/Redlands Lane/Gudge Heath Lane

6.3.43 In the Fareham Local Plan Local Junction Modelling 2021 report, it was concluded that the new set of signal timings in the Scenario 3 DS 2036 were expected to improve the capacity at this junction when compared to the Scenario 1 Baseline 2036. However, only marginal benefits were expected in the PM peak. Comparing this with the Scenario 3 DS 2036 run, it is noted that both junction and strategic modelling are consistent. Junction 18 is not flagged in the AM peak, but it is still flagged as severely impacted in the PM peak on Redlands Lane approach arm.

Junction 28 - A27 Southampton Road/Titchfield Hill, Titchfield

- 6.3.44 The A27 The Avenue was flagged in the Scenario 2 DM 2036 vs Scenario 1 Baseline 2036 as significantly impacted by the Local Plan flows, and it is now flagged as severely impacted with the Scenario 3 DS 2036 changes. This is likely due to the increase in traffic flows on this arm.
- 6.3.45 It is also noted that Titchfield Hill approach arm, which was flagged as significantly impacted in the PM peak by the Local Plan flows in the Scenario 2 DM 2036 versus Scenario 1 Baseline 2036, is now operating within capacity in the Scenario 3 DS 2036. However, the B334 Titchfield Road approach is now flagged as severely impacted in the PM peak under the RFC increase criterion. This is likely due to changes in traffic signal timings, which have reduced the green timing percentage of the cycle time available for the northbound movement from B334 Titchfield Road.

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Junction 29 - A27 The Avenue/Highlands Road

- 6.3.46 This junction was flagged in the Scenario 2 DM 2036 scenario because it met the RFC criterion on the Highlands Road arm in the AM peak. There were no changes to the Scenario 3 DS 2036, with this arm still being flagged as significantly impacted against the Baseline flows.
- 6.3.47 The same arm, Highlands Road, is also now significantly impacted in the PM peak. This is likely due to changes in traffic signal timings, which have reduced the green timing percentage of the cycle time available for the southbound movement from Highland Road.
- 6.3.48 It is suggested that re-optimisation of signal timings at this junction is performed using the Scenario 3 DS 2036 flows.

Junction 30 - A27 Southampton Road/Mill Lane, Titchfield

- 6.3.49 This junction has all its arms flagging as either significantly or severely impacted in the AM peak, in Scenario 3 DS 2036 vs Scenario 1 Baseline 2036. It also has the A27 Southampton Rd (W) flagging as significantly impacted in the PM peak. This junction performs now worse than in the Scenario 2 DM 2036, however, there is significantly more traffic using this junction in the Scenario 3 DS 2036, which has likely caused the issue.
- 6.3.50 Also, it is noted that the A27 Southampton Rd (W) arm, has had a decrease in flows in the AM peak but was flagged as severely impacted. This is likely due to changes in traffic signal timings and signal timings configuration, which have reduced the green timing percentage of the cycle time available for the eastbound movement from A27 Southampton Rd (W), and increased the time in between this stage being called.
- 6.3.51 It is suggested that re-optimisation of signal timings at this junction is performed using the Scenario 3 DS 2036 flows.

Junction 35 - A27 Segensworth roundabout/Little Park Farm Road, Segensworth

- 6.3.52 This junction had one arm flagging as significantly impacted under the RFC criterion in the AM peak, and two arms flagging as significantly impacted in the PM peak, in the Scenario 2 DM 2036 versus Scenario 1 Baseline 2036 flows. In the Scenario 3 DS 2036, all arms are now operating within capacity.
- 6.3.53 However, the adjacent junction Southampton Road / Telford Way is now over capacity due to the rerouting of traffic via Telford Way, with the closure of Little Park Farm Rd entry arm.

Junction 37 - Cartwright Drive/Whiteley Lane/Barnes Wallis Road, Segensworth

6.3.54 As a result of the mitigation measures at Junction 37, the previously flagged Whiteley Lane (N) arm as severely impacted in the Scenario 2 DM 2036, is now flagged as significantly impacted in the Scenario 3 DS 2036, in the AM peak. There was a minor reduction in traffic flows on this arm, and with the increased capacity due to the increased flared lane lengths, have led to a reduction in the RFC.





6.3.55 It is noted that despite the great increase in traffic flows on Cartwright Drive in the AM Peak, and on Whiteley Lane (N) in the PM peak, the significant/severe criteria were not triggered on those arms.

Junction 38 - Cartwright Drive/Segensworth Road East

- 6.3.56 The Segensworth Road East arm was previously flagged as severely impacted in this junction due to the RFC criterion, as part of the Scenario 2 DM 2036 versus Scenario 1 Baseline 2036 analysis. In the Scenario 3 DS 2036, this arm is no longer flagged despite the increase in traffic flows, showing that the increase in capacity in this arm has solved the issue.
- 6.3.57 However, in the AM peak, the Cartwright Drive (S) arm was previously flagged as significantly impacted in the Scenario 2 DM 2036, and is now flagged as severely impacted in the Scenario 3 DS 2036. This is likely due to the large increase in traffic flows in this arm as described in the previous sections.

Junction 50 - A27 Bridge Road/Coldeast Way/Ironbridge Crescent, Park Gate

6.3.58 The proposed scheme at Junction 50 has increased capacity on the A27 Bridge Road (W) arm which was previously flagged as significantly impacted in the PM peak of the Scenario 2 DM 2036, and is no longer flagged in the Scenario 3 DS 2036. There was an increase of around 30 pcus on this arm.

Junction 56 - A3051 Botley Road/Yew Tree Drive, Whiteley

6.3.59 The proposed scheme at Junction 56 has increased capacity on Yew Tree Drive (E) arm which was previously flagged as significantly impacted in the PM peak of the Scenario 2 DM 2036, and is no longer flagged in the Scenario 3 DS 2036, despite the significant increase of over 260 pcus on this arm.

Additional junctions flagged as 'significant' or 'severe'

- 6.3.60 Table 6-6 has the complete list of junctions flagged as 'significant' or 'severe' in the Scenario 3 DS 2036 when compared with Scenario 1 Baseline 2036. The junctions highlighted in blue are those additional ones which were not previously flagged in the Scenario 2 DM 2036.
- 6.3.61 The first junction is J32 St Margaret's Roundabout, which was flagged as severely impacted under the delay criterion in the AM peak, on the Warsash Road arm. The same arm experienced a decrease in traffic flows of 40 pcus. However, there were increases in other arms of the roundabout, especially the A27 Southampton Road (SE) arm, which experienced over 350 extra pcus in the AM peak of Scenario 3 DS 2036 compared to Scenario 2 DM 2036.
- 6.3.62 The second junction is J41 Botley Road / A27 / Hunts Pond Road / Southampton Road, which was flagged as severely impacted under the delay criterion in the PM peak. There was an increase of around 10 pcus using the A3051 Botley Road arm in the Scenario 3 DS 2036 comparing with Scenario 2 DM 2036, in the PM peak. This arm was already experiencing large delays of over 140 seconds in both Scenario 1 Baseline 2036 and





Scenario 2 DM 2036, and was over capacity with RFC of over 105% in both scenarios, likely due to the A27 eastbound movements in this roundabout.

- 6.3.63 The third junction is J46 Peters Road / Lockswood Roundabout which was significantly impacted by the Scenario 3 DS 2036 flows, on the Lockswood Road (S) arm under the RFC criterion in the AM peak. This is likely due to increase in traffic flows, of around 35 pcus, in the AM peak. It is noted that this arm was near its capacity in Scenario 2 DM 2036, with RFC of 84%, and now experiences RFC of 89% in Scenario 3 DS 2036.
- 6.3.64 The fourth junction is J49 Lockswood Road / Brook Lane Roundabout, flagged as significantly impacted in the PM peak on the Brook Lane arm in Scenario 3 DS 2036, with an increase of 30 pcus on that arm when compared to Scenario 2 DM 2036. It is noted that this junction was almost triggered in the Scenario 2 DM 2036 as well.
- 6.3.65 The fifth junction is J51 A27 Bridge Road / Station Road / Brook Lane Roundabout, flagged as severely impacted in the AM peak on the Station Road arm in Scenario 3 DS 2036, under the RFC criterion. All arms in this junction are well over capacity in both Scenario 1 Baseline 2036, and Scenario 2 DM 2036. The increase of over 20 pcus on that arm in the AM peak in Scenario 3 DS 2036 triggered the 'severe' RFC criterion but it is noted that this junction was already over capacity in all other scenarios.
- 6.3.66 The sixth junction is J54 Botley Road / Yew Tree Drive which was flagged as severe in the PM peak on the A3051 Botley Road (S) arm, likely due to the huge increase of traffic flows in other arms of the roundabout, such as the increase of over 300 pcus on the Yew Tree Drive arm.
- 6.3.67 The seventh junction is J55 Sweethills Crescent / Yew Tree Roundabout which was flagged as severe in the PM peak on the Yew Tree Drive (E) arm, likely due to the significant increase of over 200 pcus in that arm.
- 6.3.68 The eighth junction is J67 Segensworth Road East / Fontley Road / Mill Lane flagged as severely impacted in the PM peak under the RFC criterion, on the Segensworth Road East arm. This is likely due to the huge traffic increase of 100 pcus in the Scenario 3 DS 2036.
- 6.3.69 The ninth junction is J68 A27 The Avenue / Ranvilles Lane flagged as severely impacted in the AM peak under the RFC criterion, on the Ranvilles Lane arm. This is likely due to the increase of 100 pcus on this arm in the Scenario 3 DS 2036.
- 6.3.70 Both Junctions 67 and 68 were not flagged as having RFC higher than 80% in either the Scenario 1 Baseline 2036 and Scenario 2 Do Minimum 2036.







Figure 6-12 Junctions Forecast to have an RFC > 80% in the 2036 Scenario 3 DS

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Figure 6-13 2036 Scenario 1 Baseline vs 2036 Scenario 3 DS – Impacted Junction Locations

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 Table 6-6 2036 Do Something vs 2036 Baseline Impacted Junction List (highlighted junctions are those not impacted in the Do Minimum)

ID	JUNCTION NAME	SIGNIFICANTLY IMPACTED	SEVERELY IMPACTED
10	A32 / High Street / Wallington Way	Υ	
15	Station Roundabout	Y	
18	A27 The Avenue / Redlands Lane / Gudge Heath Lane		Y
20	Longfield Avenue / Newgate Lane	Y	
24	B3334 Titchfield Road / Bridge Street		Y
28	Titchfield Gyratory		Y
29	A27 The Avenue / Highlands Road	Υ	
30	A27 Southampton Road / Mill Lane		Y
<mark>32</mark>	St Margarets Roundabout		Y
37	Barnes Wallis Road / Whiteley Lane / Cartwright Drive	Y	
38	Segensworth Road East/Carwright Drive		Y
39	Southampton Road / Telford Way Roundabout		Y
<mark>41</mark>	Botley Road / A27 / Hunts Pond Road / Southampton Road		Y
<mark>46</mark>	Peters Road / Lockswood Roundabout	Y	
<mark>49</mark>	Lockswood Road / Brook Lane Roundabout	Y	
<mark>51</mark>	A27 Bridge Road / Station Road / Brook Lane Roundabout		Y
<mark>54</mark>	Botley Road / Yew Tree Drive		Y
<mark>55</mark>	Sweethills Crescent / Yew Tree Drive Roundabout		Y
57	Bridge Road/Swanwick Lane	Y	
58	A27 Bridge Road/Barnes Lane		Y
65	Highlands Road / Fareham Park Road	Υ	
<mark>67</mark>	Segensworth Road East / Fontley Road / Mill Lane		Y
<mark>68</mark>	A27 The Avenue / Ranvilles Lane		Y





7. SUMMARY AND CONCLUSIONS

- 7.1.1 Solent Transport's SRTM has been utilised to test three scenarios to help inform the development and appraisal of the update to Fareham's Local Plan:
 - Scenario 1 2036 Baseline, no Fareham Local Plan development except for committed sites.
 - Scenario 2 2036 Do Minimum, full Fareham Local Plan development without transport mitigation.
 - Scenario 3 2036 Do Something, full Fareham Local Plan development with transport mitigation.

7.2 2036 Scenario 1 Baseline

- 7.2.1 The Baseline scenario includes residential (approximately 5,700 dwellings) and employment growth based on committed sites within the Fareham Borough, and any committed highway infrastructure schemes up to a forecast year of 2036. Outside of Fareham, growth continues in accordance with adopted Local Plans and TEMPro v7.2. This scenario confirms the forecast transport network performance without the proposed Fareham Local Plan allocation site growth.
- 7.2.2 Due to the general increase in traffic flows within the Fareham Borough though to 2036, a total of 62 junctions within Fareham district are forecast to operate with an RFC greater than 80% in the 2036 Baseline Scenario.

7.3 2036 Scenario 2 Do Minimum

- 7.3.1 The 2036 Do Minimum scenarios build off the Baseline, by including the proposed Fareham Local Plan allocations for residential and employment development. Growth outside of the Borough is unchanged from the Baseline. An additional approximate 5,600 dwellings have been included within the Do Minimum scenario over and above the Baseline.
- 7.3.2 The highway network tested within the Baseline and Do Minimum scenario remain consistent to assess the impact of the Local Plan allocations without any new mitigation.
- 7.3.3 Based on the SRTM modelling the majority of links within the district are forecast to experience changes no greater than +/-100 PCUs in either direction. Some exceptions to which being Peel Common roundabout, Stubbington Bypass, Longfield Avenue / Bishopsfield Road, and the Daedalus Access on the B3385 Broom Way / Cherque Way.
- 7.3.4 A total of 65 junctions within Fareham district are forecast to operate with an RFC greater than 80%. This is an increase of 3 junctions across the district in comparison to the 2036 Baseline. Of those 65 junctions, it is forecast that 11 will experience 'significant' impact and 8 junctions 'severe' impact in comparison to the 2036 Baseline.
- 7.3.5 The list of 19 junctions forecast with either 'significant' or 'severe' impact were recommended to form the starting point for more detailed review and development of potential mitigation measures in consultation with the Highway Authority.

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7.4 2036 Scenario 3 Do Something

- 7.4.1 The 2036 Do Something scenario was built off Scenario 2 Do Minimum, by including the proposed mitigation measures to the highway network. As agreed with the Highway Authority, these mitigation measures are presented as worst-case options; active travel and public transport solutions should be sought first.
- 7.4.2 The Transport Assessment identified nine junctions listed below where mitigation has been proposed and the preliminary designs have been incorporated into the SRTM:
 - A27 The Avenue/Redlands Lane/Gudge Heath Lane;
 - A27 Southampton Road/Titchfield Hill, Titchfield;
 - A27 The Avenue/Highlands Road;
 - A27 Southampton Road/Mill Lane, Titchfield;
 - A27 Segensworth roundabout/Little Park Farm Road, Segensworth;
 - Cartwright Drive/Whiteley Lane/Barnes Wallis Road, Segensworth;
 - Cartwright Drive/Segensworth Road East;
 - A27 Bridge Road/Coldeast Way/Ironbridge Crescent, Park Gate;
 - A3051 Botley Road/Yew Tree Drive, Whiteley.
- 7.4.3 Land use allocations between Scenario 2 Do Minimum and Scenario 3 Do Something and associated transport demand remain consistent and it is only the modelled transport network that has changed.
- 7.4.4 A total of 62 junctions in Fareham district are forecast to operate with an RFC greater than 80% in the do Something. This is a decrease of 3 junctions from the Scenario 2 Do Minimum and the same number as the number forecast to meet this threshold in Scenario 1 Baseline. It is noted that although the number of junctions is similar, the list of junctions is different between each scenario.
- 7.4.5 It is forecast that 9 junctions will experience 'significant' impacts in comparison to Scenario 1 Baseline and 14 junctions with 'severe' impacts. This represents a 2 junction decrease of significant and 6 junction increase of severe impacted junctions compared to the Do Minimum. However, 4 out of the 9 junctions with mitigation proposed are now forecast below the significant or severe criteria:
 - Segensworth Roundabout
 - Barnes Wallis Road / Whiteley Lane / Cartwright Drive
 - A27 Bridge Road / Coldeast Way
 - Sweethills Crescent / Yew Tree Drive
- 7.4.6 There are 3 junctions which are forecast to have the same significant or severe criteria:
 - A27 The Avenue / Redlands Lane / Gudge Heath Lane
 - A27 The Avenue / Highlands Road
 - Segensworth Road East/Cartwright Drive
- 7.4.7 There are only 2 junctions out of the mitigated junctions which are now forecast to fit within the severe criteria, and the main reasons are rerouting and higher traffic flows in these areas in both AM and PM peaks:

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- Titchfield Gyratory
- A27 Southampton Road / Mill Lane
- 7.4.8 There are 9 junctions not previously identified as having 'significant' or 'severe' impacts in the Do Minimum. New junctions triggering one of the 'significant' or 'severe' criteria are not entirely unexpected due to the mitigation measures incorporated potentially releasing bottlenecks that then impact downstream locations, or changing the assignment of vehicles through the network. It is also noted that many of these junctions were already at or over capacity in the Scenario 1 Baseline 2036 and Scenario 2 DM 2036, and as such, any minor changes in traffic flows are likely to result in large increases in delay and RFC. It is recommended that the junctions identified as experiencing significant or severe impacts be reviewed to determine if any additional mitigation is necessary.
- 7.4.9 Additionally, the highway network might benefit from re-optimisation of signal timings using local junction modelling software in those mitigated junctions and on the newly impacted junctions due to the updated traffic flows on the highway network.

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