Transport for South Hampshire and Isle of Wight Evidence Base

New Community North of Fareham SRTM Modelling Analysis

Report for Fareham Borough Council

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Contents

1 Introduction

1.1 SRTM Background

1.1.1 MVA Consultancy was commissioned, as part of a wider team, to support Transport for South Hampshire (TfSH) with the development and application of a Sub-Regional Transport Model Suite (SRTM) for this nationally important area.

1.1.2 The SRTM has been developed to support a wide-ranging set of interventions across the TfSH 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.

1.2 New Community North of Fareham (NCNF)

1.2.1 The NCNF is proposed on the land to the north of Fareham Town Centre and the M27. It is envisaged that the NCNF will consist in the region of 6500 dwellings with employment land use sufficient to provide approximately 5700 jobs.

1.2.2 The SRTM has been used to assess the impact of the NCNF and to assist with the identification of the appropriate transport strategy for the development for a forecast year of 2036.

1.2.3 Use of the SRTM in a fully forecasting mode (whereby the amount of development taken up at NCNF is projected) was not required. Instead the NCNF development has been tested fully (100%) developed in order to identify the maximum transport impacts related to the development.

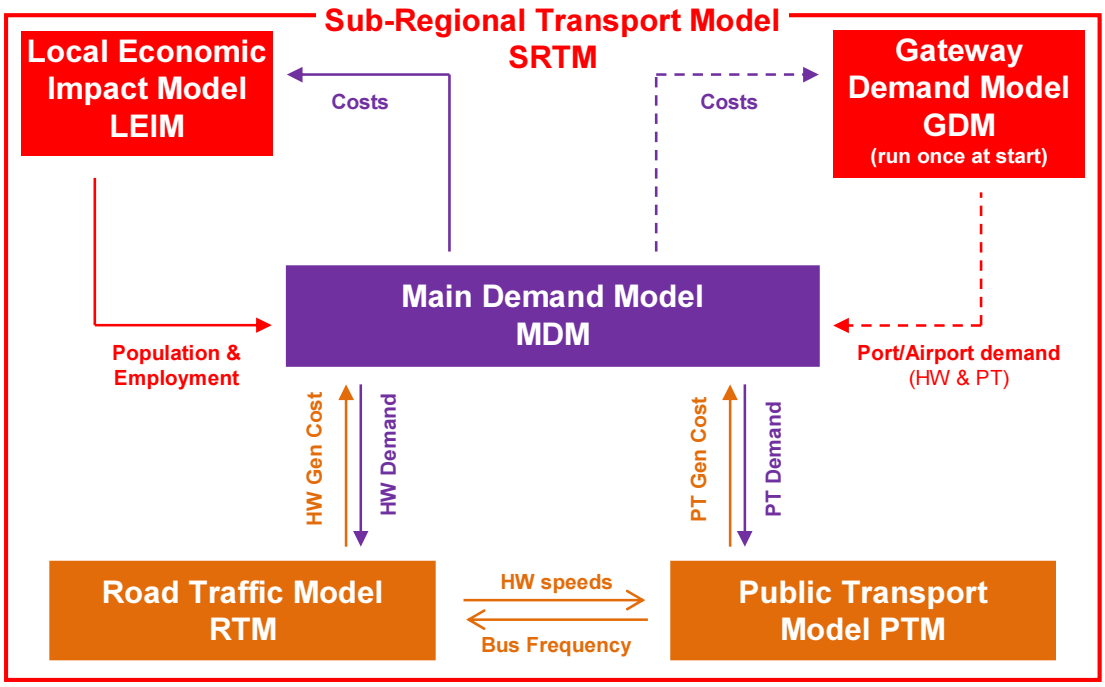
1.3 Sub Regional Transport Model Context and Scope

1.3.1 The SRTM is a suite of linked models comprising the following components as shown in Figure 1.1:

- 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;

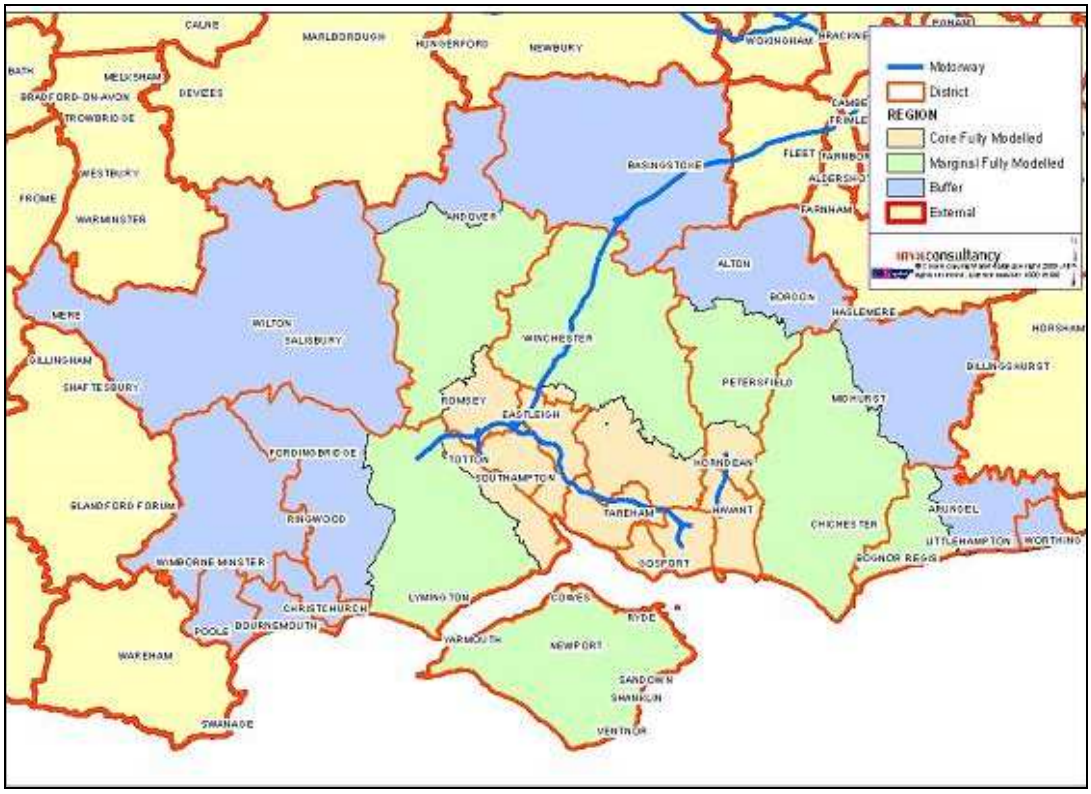
- the Public Transport Model (PTM) which determines routes and services chosen by public transport passengers; and
- a Local Economic Impact Model (LEIM) which uses inputs including transport costs to forecast the quantum and location of households, populations and jobs.

Figure 1.1 TfSH Sub-Regional Transport Model



1.3.2 The modelled area of the SRTM is divided into four regions, shown in Figure 1.2, which differ by zone aggregation and modelling detail. The NCNF site is within the Core Fully Modelled Area.

Figure 1.2 Study Area of the SRTM



1.3.3 In accordance with guidance three weekday periods are modelled in the SRTM:

- AM peak: busiest hour between 0700 and 1000, (defined as 38.2% of the three hours for Highway and 40% for Public Transport);
- Inter peak: average of 1000 to 1600 (i.e. 16.7% of the six hours for both modes); and
- PM peak: busiest hour between 1600 and 1900, (defined as 35.8% of the three hours for Highway and 40% for Public Transport).

1.3.4 The SRTM has a base year of 2010, and forecast years of 2014, 2019, 2026, 2031 and 2036. In addition LEIM provides forecasts through to 2041. For the NCNF tests the model was projected forward up to 2036.

1.3.5 In early 2013 a re-validation exercise was undertaken on the SRTM with a prime objective to improve highway link flow validation on the strategic highway network including on the M27 in the vicinity to the proposed NCNF site. The re-validation work incorporated traffic data provided post original model development (2010) and advancements/ best practice in the coding of specific highway and junction arrangements. The results of the improved Base Year (2010) validation of SRTM on the strategic highway network in the vicinity to the NCNF site (M27 J9-12) is summarised in Appendix A.

1.4 Previous assessments of NCNF using SRTM

1.4.1 The SRTM was utilised in late 2011 and early/mid 2012 to assess and inform earlier iterations of the development quantum and highway infrastructure associated to the NCNF

proposals and for a design year of 2031. The results of the previous SRTM model runs (Runs 1-4) were summarised in the MVA produced Report[1].

1.4.2 Runs 1-4 were completed using a version of SRTM that pre-dates the recent re-validation exercise (Section 1.3.5). Due to the differences between elements of the underlying highway coding and link flow validation between the old and the updated SRTM, the results of Runs 1-4, whilst still valid in isolation, are not reproduced or directly compared to subsequent model runs in this document. . It should also be noted if comparing model runs that the design year for the earlier model runs (Runs 1 (old) to 4) was 2031 and not 2036 as modelled in Runs 1 (new) and 5 reported in this report.

[1] New Community North of Fareham SRTM Tests (Runs 1-4), Version 7, November 2012, MVA Consultancy

2 NCNF Development Site Assumptions

2.1 Introduction

2.1.1 This chapter describes the planning assumptions for the NCNF.

2.2 Reference Case Committed Schemes and Developments

2.2.1 The SRTM model represents conditions up to the year 2036. Known developments and committed highway schemes are included within the models' reference case scenarios (2014, 2019, 2026, 2031 and 2036) to provide the most accurate representation of future year conditions. A list of the known developments and committed highway schemes included in the Reference Cases is provided as Appendix B.

2.3 NCNF Planning Assumptions

2.3.1 The current land use assumptions at the NCNF provided by FBC are summarised in Table 2.1. Table 2.2 summarises the highway and public transport proposals associated to the development area. Greater detail on the highway/ PT schemes is provided in Chapter 3. All planning assumptions relate to a design year of 2036.

Table 2-1 NCNF Land Use Assumptions

Model Run	Year	Residential (dwellings)	Employment[2] (jobs)	Employment (m2)	Education (schools)
5	2036	6,500	5700	78,650[1]	4

1. The previous model runs (Runs 1-4) input employment floorspace with SRTM forecasting the associated number of jobs created. For Run 5, an employment floorspace was specified but FBC requested that the number of jobs created be fixed as opposed to forecast. It was therefore necessary to allow the volume of floorsapce to 'float' to enable the model to forecast the appropriate volume of floorspce to meet the required job creation target. The actual forecast floorspace is included in Chapter 4.
2. Includes: Office, Industrial, Retail, Residential Care, Civic and Leisure employment types

Table 2-2 NCNF Highway/ Public Transport Assumptions

Model Run	Year	Highway/ PT	Measures
5	2036	Highway	• M27 J10 upgraded to all movements • 5 NCNF site access on A32 (1 priority, 2 roundabouts, 2 signals). • Clockwise gyratory incorporating A32 between M27 E/B off slip and southern NCNF site access
		PT	• All existing A32 services to divert in to NCNF • BRT from NCNF to Gosport • BRT from NCNF to Portsmouth via A27 • BRT from NCNF to Portsmouth via M27 J10 (Fast Track)

3 Modelling NCNF in the SRTM

3.1 Introduction

3.1.1 This chapter describes how the SRTM has been amended to represent the NCNF.

3.2 Zoning

3.2.1 Travel in the model is aggregated into zones which therefore determine the spatial detail available. The definition of zones takes account of barriers (rivers, railways, motorways) as well as administrative and planning data boundaries (TfSH zones are aggregations of Census Output Areas in the fully modelled area and wards elsewhere). In addition zones accounted for land use types, access points onto the road network as well as respecting screenlines for trip matrix validation. For public transport catchment areas for rail stations and bus stops and fare boundaries were also considered and additional zones are included for the ports and airports.

3.2.2 In order to model the development at the NCNF, five new zones (SRTM Zones 733 to 737) have been added to the network as shown in Figure 3.1. Four of the new zones cover to development to the west of the A32 and 1 new zone to the east.

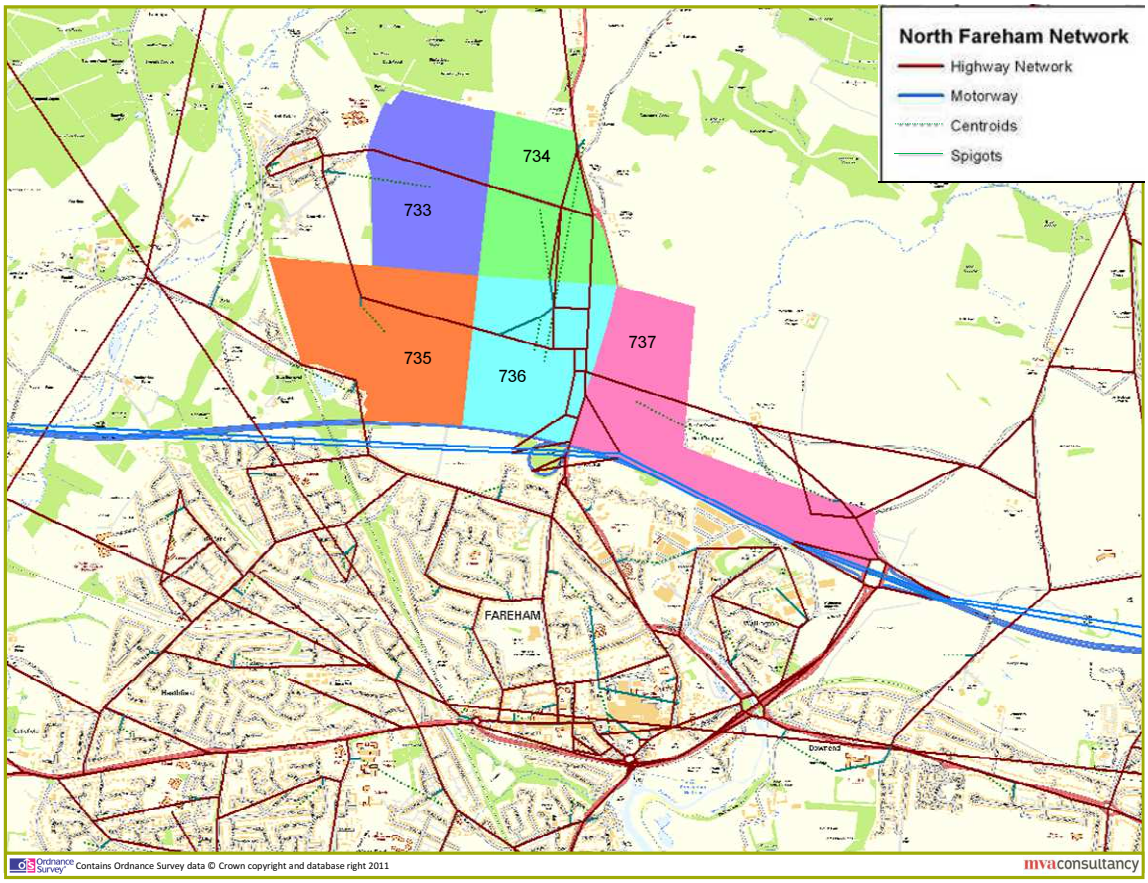


Figure 3.1 NCNF Zones and Highway Links

3.3 Scenarios

3.3.1 Figure 3.3 identifies the scenarios that have been modelled in order to assess the impact of the NCNF.

3.3.1 The scenarios at the lowest level (Base / FYR) are the standard set of SRTM scenarios; 2010 base year validation and 2014, 2019, 2026 and 2031 Future Year Reference (FYR) Cases. In the FYR cases development is permissible at the NCNF site; the level of development is determined by the LEIM.

3.3.2 In the non-development model run (Run 1) development is not permitted at the NCNF site and highway infrastructure is unchanged from the Reference Case. This is to provide a set of scenarios against which to measure the impact of the development. Run 5 includes both the NCNF development quantum and the associated highway, PT and active mode infrastructure. In Run 5 the NCNF development fully built out.

3.3.3 The solid yellow arrow shows the scenarios that were compared to establish the impact of the development.

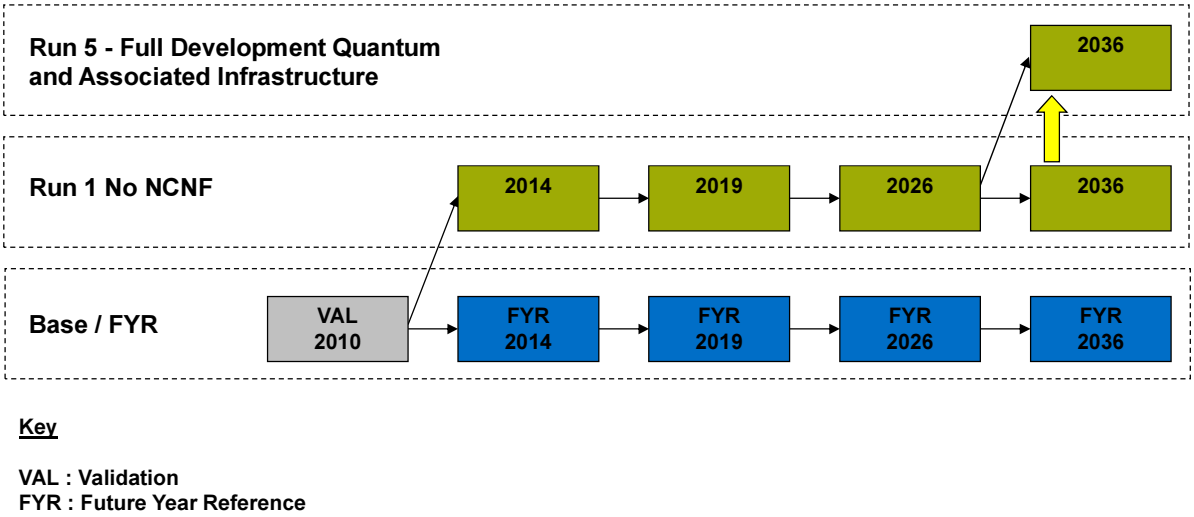


Figure 3.2 Scenarios Modelled to Assess the Impact of NCNF

3.4 Highway and Public Transport Network Changes

Highway

3.4.1 At the time of this study the highway measures associated to the NCNF were of an indicative nature and it is expected will be subject to downstream refinement. Signal timings for the new signal junctions were provided for the AM peak only and have been applied to all modelled peaks. Again, it is expected that the signals timings will be further refined for each period as the design progresses. The modelling undertaken using SRTM provides an initial indication of forecast bottlenecks where further design and refinement may be required. The highway measures included in the individual scenarios are detailed in the drawings provided by Parsons Brinckerhoff in Appendix C.

Public Transport

3.4.2 In addition to the existing local bus services on A32 diverting in to the NCNF the main PT proposals relate to the interaction/ extension of proposed BRT routes to the NCNF. The PT measures included in the individual scenarios are detailed in Table 3.1 and the proposed BRT routes and existing service diversion are shown on Figures 3.4 and 3.5. Each pair of lines in Figure 3.3 and Figure 3.4 represents an individual service (out and back).

Table 3-1 NCNF PT Schemes

Run	Scheme	Description
1	Committed Schemes	See Appendix B
	BRT from Fareham TC to Portsmouth	Fareham Bus Station to Portchester and Portsmouth via A27. Frequency of 3bph
5	BRT from NCNF to Gosport	NCNF to Gosport via Fareham Railway Station (not bus station). This is additional to Phase 1 BRT (committed scheme). (See Fig 3.6). Frequency of 4bph
	BRT from NCNF to Portsmouth via A27	Extension of the Run 1 route to the NCNF. (See Fig 3.4). Frequency of 3bph
	BRT from NCNF to Portsmouth via M27 (J10)	NCNF to Portsmouth via M27 J10 and M275. Fast track service. (See Fig 3.4). Frequency of 3bph
	Existing routes to access NCNF	All existing services on A32 to divert to NCNF (Fig 3.5). No change to existing frequencies.

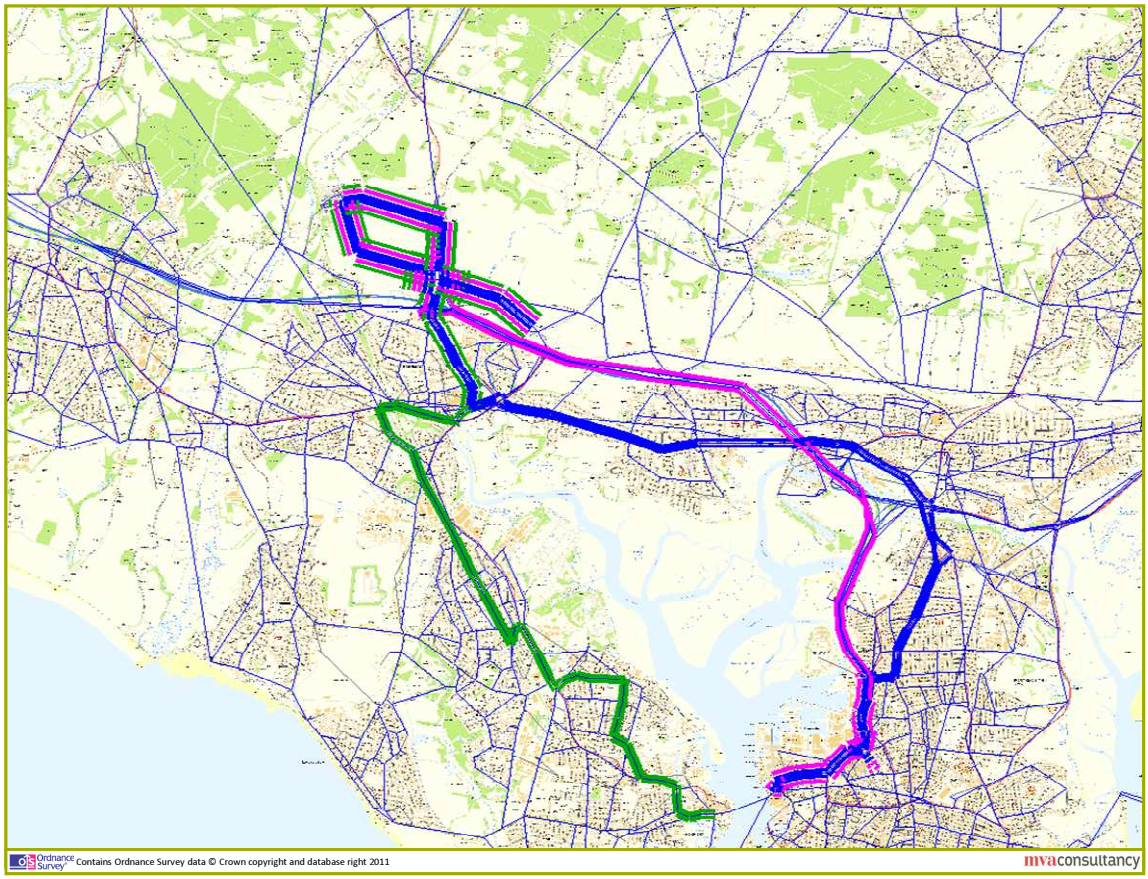


Figure 3.3 New BRT Routes servicing NCNF

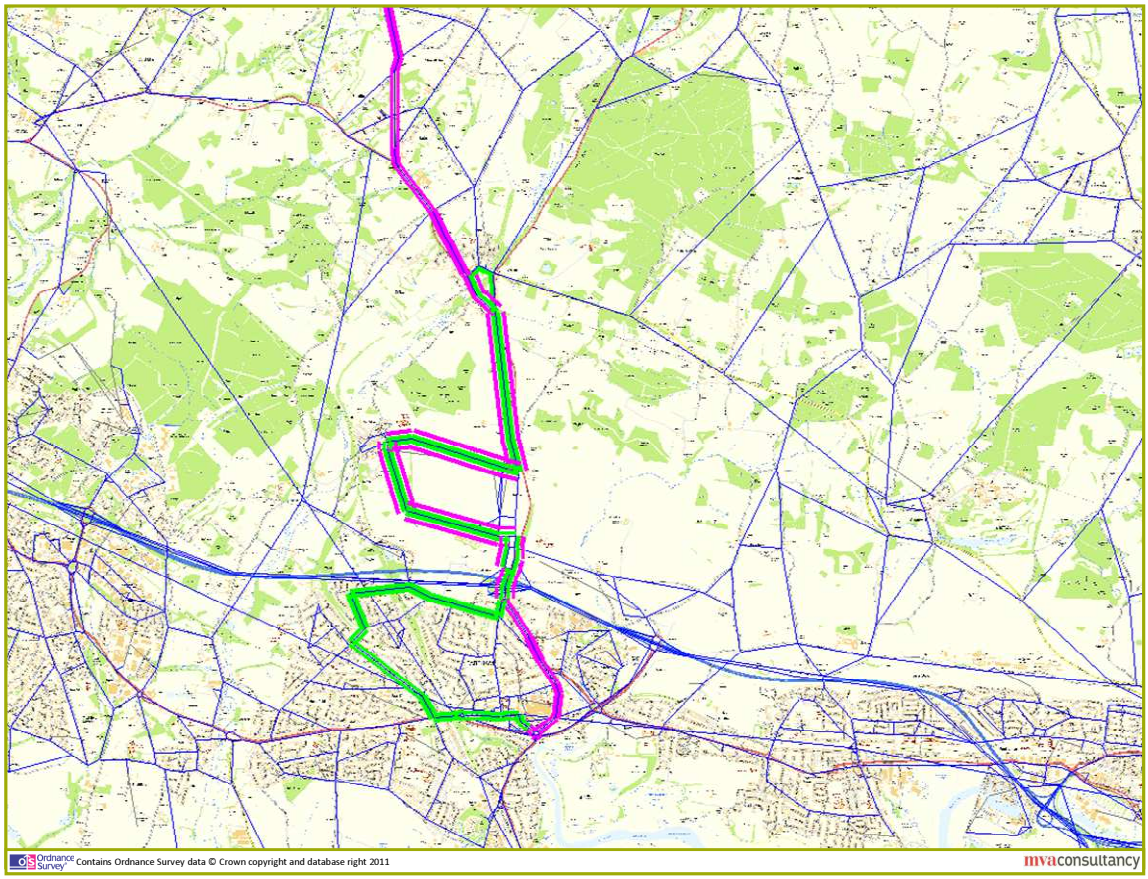


Figure 3.4 Existing A32 Bus Routes Diverted to NCNF

Active Modes

3.4.3 At the time of this study the active mode measures associated to the NCNF were also of a very indicative nature and scheme details were only provided as a brief text description. The Active Mode measures included in the individual scenarios are detailed in Table 3.2.

Table 3-2 NCNF Active Mode Schemes

Run	Scheme	Description
1	Committed Schemes	See Appendix B
5	Improved cycle and pedestrian links to Fareham Town Centre	Assumed 30s reduction in pedestrian/ cycle journey time
	Additional off site pedestrian and cycle links to Wickham	Assumed 30s reduction in pedestrian/ cycle journey time

Behavioural Change

3.4.4 In 2012 TfSH was successful in securing funding from DfT for a wide package of measures in relation to the Local Sustainable Transport Fund (LSTF). The TfSH submission was based on 9 corridors within the sub region, one of which included Fareham. In addition to physical scheme proposals the LSTF submission included measures to promote behavioural change (BC) such as travel plans and personalised journey planning in order to reduce the dependence on travel by car. The most widespread BC intervention within the LSTF corridors was personalised journey planning and the modelling representation of this measures in the 9 corridors in SRTM is summarised in Table 3.3 below and is included within the standard SRTM forecast reference cases as a committed schemes.

Table 3-3 SRTM LSTF Corridor Personalised Journey Planning Behavioural Change Assumptions

Reduction in Car trips	Reassigned mode for removed car trips		
	to PT	to Active	Removed from model (assumed that journey will no longer happen)
-12%	70% (of 12% car reduction)	20% (of 12% car reduction)	10% (of 12% car reduction)

3.4.5 The LSTF corridor that included Fareham did not extend north of M27. To include a representation of behavioural change within the NCNF proposals it has been assumed in the SRTM modelling that the impacts of personalised journey planning (as per Table 3.3) will extend into the NCNF development zones.

4 Results – Main Demand Model and LEIM

4.1 Introduction

4.1.1 This section identifies the forecasts produced by the MDM and the LEIM for the NCNF, including forecast jobs, trips, mode share and emissions.

4.2 Population, Dwellings, Jobs

4.2.1 Tables 4.1 to 4.3 show the LEIM forecasts for the population, number of dwellings and number of jobs within the NCNF and the surrounding Districts compared to the without development scenario (Run 1).

4.2.2 The LEIM module of SRTM controls the level of overall development take-up within the model in accordance with TEMPRO employment and population targets for the sub-region which conforms with WebTAG. This is equivalent to allowing for background traffic growth within the modelling process.

4.2.3 The take up of permissible developments (both in terms of location and timeframe) is determined by LEIM based on the local conditions (the relative 'attractiveness' of the development).

4.2.4 In the 'without NCNF Development' (Run 1) scenario no development is permitted within the 5 development zones. The 'with NCNF Development' (Run 5) scenario forces the development uptake at the 5 development zones to 100% by 2036 to ensure the full impact of the development trips can be quantified. The uptake of all other non-committed developments within the model is determined by LEIM.

4.2.5 Both scenarios remain controlled to TEMPRO employment and population targets. It therefore follows that if the NCNF development is forced it would draw population/ employment from other areas when compared to the 'Without' scenario. This is why an increase in NCNF can result in less development in say Portsmouth compared to the 'without' scenario.

4.2.6 It should be stressed that the comparisons are based on two forecast year scenarios representing alternative trajectories of development for comparison purposes rather than representing a sudden change from the NCNF development opening (i.e. if development does not occur in Welborne it can occur elsewhere hence the total difference in jobs etc for the whole SRTM between the with and without scenarios is not just equivalent to the NCNF targets).

4.2.7 The SRTM outputs for NCNF dwellings and jobs as summarised in Tables 4.2 and 4.3 is consistent with the FBC targets of 6500 dwellings and 5700 jobs and confirms that the SRTM is replicating the desired level of development within the five NCNF development zones.

4.2.8 The employment related floorspace output by SRTM to achieve the target job creation and employment type split was 151,438m^2. Increasing the proportion of higher density employment types (e.g. office) would reduce the required floorspace.

Table 4.1 Forecast Change in Population

District	Run 1	Run 5	Difference (5 vs. 1)
East Hampshire (Core)	20,821	20,557	-264
Eastleigh	126,951	126,407	-544
Fareham (exc. NCNF)	108,611	105,789	-2,822
Gosport	86,424	85,356	-1,068
Havant	122,559	120,993	-1,566
New Forest (Core)	66,944	66,713	-231
Test Valley (Core)	44,779	44,656	-123
Winchester (Core)	69,448	68,690	-758
Portsmouth	252,720	249,008	-3,712
Southampton	265,696	264,708	-988
NCNF	0	15,331	15,331
Total	**1,164,953**	**1,168,207**	**3,254**

SRTM Ref: YH v WC

Table 4.2 Forecast Change in Dwellings

District	Run 1	Run 5	Difference (5 vs. 1)
East Hampshire (Core)	9,064	8,953	-111
Eastleigh	56,648	56,466	-182
Fareham (exc. NCNF)	48,827	47,373	-1,454
Gosport	37,811	37,332	-479
Havant	54,027	53,360	-667
New Forest (Core)	29,331	29,249	-82
Test Valley (Core)	19,676	19,633	-43
Winchester (Core)	29,529	29,192	-337
Portsmouth	111,965	110,402	-1,563
Southampton	113,122	112,797	-325
NCNF	0	6,496	6,496
Total	**510,000**	**511,253**	**1,253**

SRTM Ref: YH v WC

Table 4.3 Forecast Change in Jobs

District	Run 1	Run 5	Difference (5 vs. 1)
East Hampshire (Core)	3,711	3,636	-75
Eastleigh	57,495	57,429	-66
Fareham (exc. NCNF)	43,721	43,400	-321
Gosport	23,103	22,579	-524
Havant	40,563	39,587	-976
New Forest (Core)	16,322	16,295	-27
Test Valley (Core)	17,919	17,904	-15
Winchester (Core)	21,273	20,814	-459
Portsmouth	106,359	103,921	-2,438
Southampton	116,038	115,849	-189
NCNF	0	5,703	5,703
Total	**446,504**	**447,117**	**613**

SRTM Ref: YH v WC

4.3 Total Person Trips to/from NCNF and Mode Split

4.3.1 Table 4.4 shows the forecast person trips to and from the development, by mode for Run 5. The total number of person trips to the development zones (including intra-zonal trips) is 2581 in the AM peak hour with a mode share of 58% Car, 27% PT and 16% Active. The equivalent AM peak hour total person trips from the development zones is 3142 with a mode share of 64% Car, 15% PT and 21% Active. The high level of PT accessibility that is provided by the BRT links to NCNF has resulted in a high PT mode share.

4.3.2 The PM peak hour values person trips and mode share are broadly the reverse of the AM peak hour

Table 4-4 Forecast Daily Person Trips to and from the NCNF (Run 5)

Split	Time Period	To NCNF			From NCNF		
		Car	PT	Active	Car	PT	Active
Absolute	AM Peak Hr	1484	686	411	2016	467	659
	AM (07:00-10:00)	3886	1714	1027	5277	1168	1647
	PM Peak Hr	2134	515	586	1852	644	535
	PM (16:00-19:00)	5961	1287	1465	5173	1611	1337
	Daily Trips	20291	8495	5554	19848	6740	5608
%	AM Peak Hr	58%	27%	16%	64%	15%	21%
	AM (07:00-10:00)	59%	26%	15%	65%	14%	20%
	PM Peak Hr	66%	16%	18%	61%	21%	18%
	PM (16:00-19:00)	68%	15%	17%	64%	20%	16%
	Daily Trips	59%	25%	16%	62%	21%	17%

SRTM Ref: YH

4.3.3 Figures 4.2 to 4.7 provide a breakdown of Sectored Demand by mode for Run 1 for the sectors identified in Figure 4.1. Figures 4.8 to 4.13 provide the equivalent sectored demand for Run 5.

4.3.4 For car trips to/ from NCNF (Run 5) there is a reasonable spread across the sectors but with Portsmouth and the 'Near West' being the most attractive origins/ destinations.

4.3.5 Over half of all PT trips to/ from NCNF (Run 5) either originate or are destined for the broad Portsmouth area. Two of the three BRT services that access the NCNF go to Portsmouth and these routes provide an attractive mode option to link the population and jobs between the City and NCNF.

4.3.6 The majority of Active mode trips that originate in are destined for NCNF (Run 5) are intra-zonal within the development which is not unexpected. The number of active mode trips to/from the NCNF reduces as distance increases and is again consistent with expected behaviour.

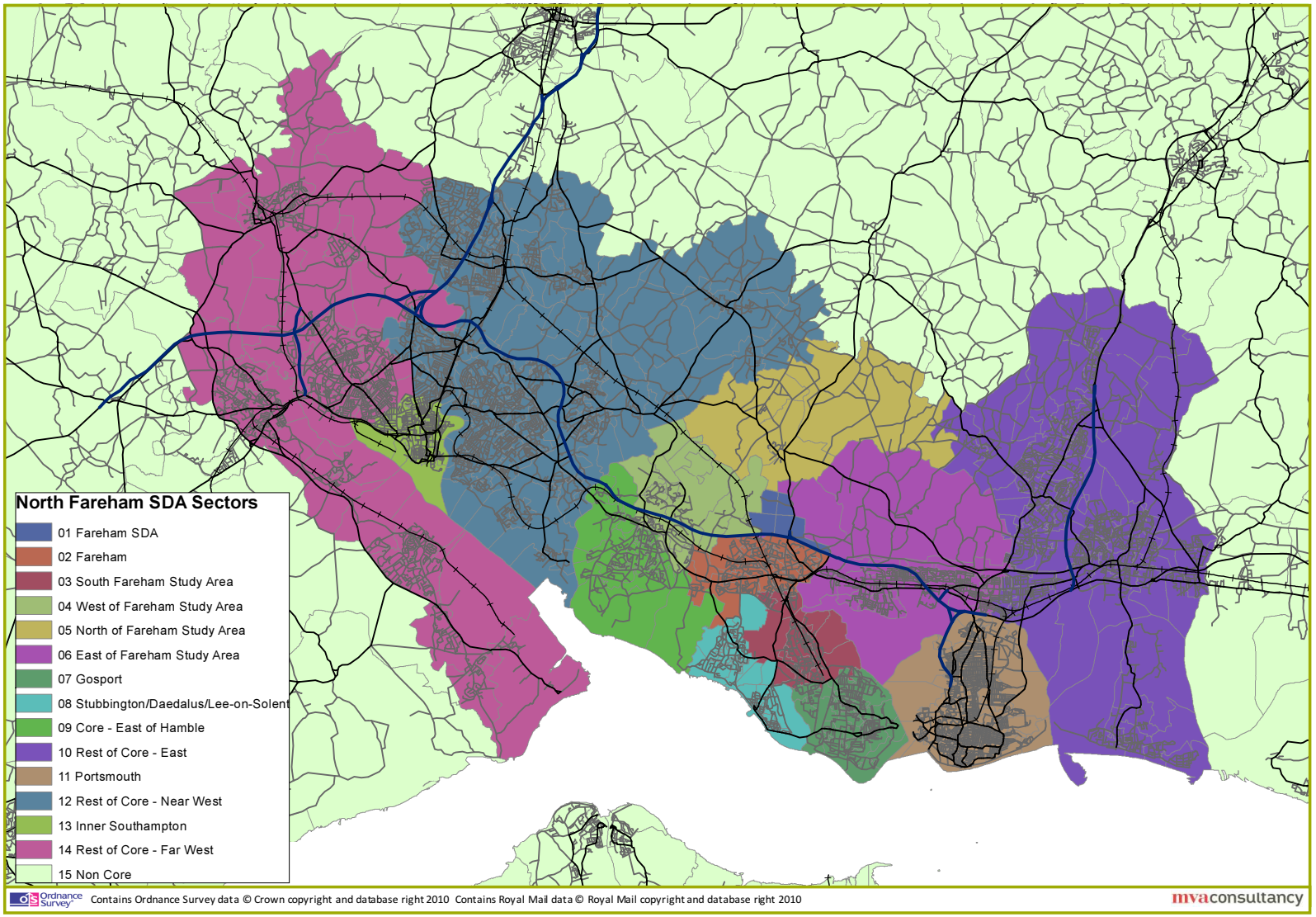


Figure 4.1 Sector Plan

AM Peak period- Car	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	2073	809	968	132	752	1042	738	582	822	696	849	87	273	874	10698	4087
Fareham Study Area - South	n/a	852	992	310	37	212	1874	685	128	255	260	187	19	61	477	6348	2425
Fareham Study Area - West	n/a	919	266	993	179	971	247	350	937	1435	1565	2007	270	330	1045	11513	4398
Fareham Study Area - North	n/a	178	42	219	48	197	36	48	77	358	218	678	112	188	267	2665	1018
Fareham Study Area - East	n/a	838	224	541	157	3456	204	294	161	5042	3648	1008	139	293	1962	17966	6863
Gosport	n/a	1563	2700	585	57	322	3908	1494	207	344	396	296	33	108	1050	13062	4990
Stubbington Area	n/a	1287	1305	495	52	288	1899	579	200	317	379	415	48	137	702	8102	3095
Core - East of Hamble	n/a	882	277	1978	134	467	263	296	1971	664	988	1639	228	334	2284	12406	4739
Rest of Core - East	n/a	1458	352	1261	304	6217	285	428	369	32337	7589	2776	437	1052	11602	66466	25390
Portsmouth	n/a	630	216	857	117	4129	217	570	243	7640	35346	1154	183	475	7081	58859	22484
Rest of Core - Near West	n/a	1195	293	2185	718	1645	223	477	1486	2555	1856	49530	8505	11272	14267	96206	36751
Inner Southampton	n/a	97	24	238	62	134	16	88	192	213	180	6474	4306	5443	4104	21572	8241
Rest of Core - Far West	n/a	414	97	500	125	489	68	59	212	725	665	9744	7106	25158	11846	57209	21854
Non Core	n/a	965	371	1020	189	2357	433	244	718	6592	6145	10594	5868	10206	82383	128084	48928
Total (07:00-10:00)	n/a	13351	7968	12149	2313	21637	10715	6348	7482	59298	59931	87351	27339	55331	139942	511155	
Total (08:00-09:00)	n/a	5100	3044	4641	884	8265	4093	2425	2858	22652	22894	33368	10444	21136	53458		195261

Figure 4.2 AM Highway Sectored Demand -Run 1 (Person Trips) (Ref: WC)

AM Peak period- PT	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	149	53	43	6	96	45	43	11	76	169	60	63	7	210	1030	412
Fareham Study Area - South	n/a	81	45	9	0	18	89	25	2	23	152	21	18	1	111	595	238
Fareham Study Area - West	n/a	43	3	46	1	20	3	8	2	49	69	49	77	12	190	573	229
Fareham Study Area - North	n/a	9	0	2	9	1	0	0	0	0	3	8	3	0	48	84	34
Fareham Study Area - East	n/a	43	10	11	1	293	16	15	2	329	586	32	61	15	208	1622	649
Gosport	n/a	133	126	10	0	34	223	92	3	58	470	30	47	2	261	1489	596
Stubbington Area	n/a	35	5	4	0	9	24	17	2	11	83	14	26	3	56	289	116
Core - East of Hamble	n/a	31	1	7	0	10	1	12	4	36	53	12	97	6	134	404	162
Rest of Core - East	n/a	40	23	21	1	448	27	18	8	2668	1217	33	83	27	979	5596	2238
Portsmouth	n/a	212	60	26	1	484	112	71	5	716	2835	123	140	42	1690	6518	2607
Rest of Core - Near West	n/a	112	4	48	10	45	11	22	22	56	173	2762	2014	670	2297	8245	3298
Inner Southampton	n/a	32	2	47	1	18	4	43	35	49	127	1144	1128	702	1365	4696	1878
Rest of Core - Far West	n/a	48	0	21	1	20	1	6	5	16	56	631	1381	1693	1123	4999	2000
Non Core	n/a	159	37	104	16	189	78	30	33	573	1461	1127	1569	611	5526	11512	4605
Total (07:00-10:00)	n/a	1126	369	398	48	1685	636	401	135	4660	7454	6045	6706	3791	14198	47652	
Total (08:00-09:00)	n/a	451	147	159	19	674	254	160	54	1864	2982	2418	2682	1516	5679		19061

Figure 4.3 AM PT Sectored Demand -Run 1 (Person Trips) (Ref: WC)

AM Peak period- Active	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	3970	370	124	9	91	8	79	38	1	12	6		0	3	4711	1885
Fareham Study Area - South	n/a	579	3076	8	2	79	448	231	4	2	47	1		0	17	4496	1798
Fareham Study Area - West	n/a	280	20	1479	11	3	0	22	290	0	0	429	11	1	0	2547	1019
Fareham Study Area - North	n/a	37	2	22	477	48	0	0	1	2	0	28			2	618	247
Fareham Study Area - East	n/a	167	81	4	11	7119	26	6	0	719	633	1			3	8769	3508
Gosport	n/a	41	1102	5	1	80	7735	330	3	11	1961	0		0	90	11358	4543
Stubbington Area	n/a	166	429	6	0	5	302	1628	24	0	18	1		0	24	2605	1042
Core - East of Hamble	n/a	109	7	251	1	1	1	18	1637		0	106	5	9	6	2151	860
Rest of Core - East	n/a	5	4	0	8	1010	5	0		21470	574	1			221	23298	9319
Portsmouth	n/a	38	68	0	1	876	723	9	0	765	41643				100	44223	17689
Rest of Core - Near West	n/a	6	1	91	29	1	0	0	186	0		29516	2590	1172	329	33922	13569
Inner Southampton	n/a			5					6			3637	13960	1906	5	19519	7808
Rest of Core - Far West	n/a	1	0	2			0	0	53			1948	1159	20789	248	24202	9681
Non Core	n/a	6	36	1	3	2	92	32	16	222	133	211	2	197	267631	268584	107434
Total (07:00-10:00)	n/a	5404	5196	1997	553	9316	9341	2356	2258	23192	45023	35887	17727	24074	268679	451003	
Total (08:00-09:00)	n/a	2162	2079	799	221	3726	3736	942	903	9277	18009	14355	7091	9630	107472		180401

Figure 4.4 AM Active Mode Sectored Demand -Run 1 (Person Trips) (Ref: WC)

PM Peak period- Car	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	2033	999	1071	170	1389	1894	1397	992	1605	1097	1494	147	429	1110	15827	5666
Fareham Study Area - South	n/a	995	1010	320	50	377	3225	1539	312	418	408	407	47	120	492	9721	3480
Fareham Study Area - West	n/a	1331	373	1333	312	934	636	584	2294	1609	1438	3378	327	675	1281	16506	5909
Fareham Study Area - North	n/a	170	46	241	67	238	62	57	157	382	171	895	86	172	256	2999	1074
Fareham Study Area - East	n/a	937	250	955	259	4080	326	349	519	7908	6276	2284	245	622	2720	27731	9928
Gosport	n/a	1442	2354	367	53	401	5249	2619	353	428	457	476	59	149	923	15331	5488
Stubbington Area	n/a	1079	941	502	68	469	2202	857	426	579	774	724	122	121	514	9377	3357
Core - East of Hamble	n/a	1105	240	1263	117	335	366	377	2174	520	484	2304	233	373	984	10876	3894
Rest of Core - East	n/a	1411	407	1428	515	7335	505	446	737	38711	9472	3820	383	1011	9382	75564	27052
Portsmouth	n/a	1048	359	1315	299	5589	475	516	896	10778	45478	2551	327	791	8780	79202	28354
Rest of Core - Near West	n/a	1789	344	3326	797	1690	449	669	2441	3481	2107	60458	9223	13268	12343	112388	40235
Inner Southampton	n/a	167	35	366	178	236	46	62	226	509	302	10612	6376	9279	6517	34910	12498
Rest of Core - Far West	n/a	566	98	703	201	471	148	236	479	1125	766	14794	7795	31755	13880	73018	26141
Non Core	n/a	1439	512	1489	324	2728	1142	850	2011	13236	9056	14797	5520	12771	106533	172407	61722
Total (07:00-10:00)	n/a	15513	7968	14680	3410	26273	16725	10558	14017	81289	78287	118994	30891	71537	165714	655857	
Total (08:00-09:00)	n/a	5554	2852	5255	1221	9406	5988	3780	5018	29101	28027	42600	11059	25610	59326		234797

Figure 4.5 PM Highway Sectored Demand -Run 1 (Person Trips) (Ref: WC)

PM Peak period- PT	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	162	90	49	16	75	156	43	38	46	208	103	42	19	114	1161	464
Fareham Study Area - South	n/a	56	49	4	1	14	149	13	2	19	133	4	3	0	41	488	195
Fareham Study Area - West	n/a	49	11	34	1	11	11	4	6	20	62	48	52	20	106	434	173
Fareham Study Area - North	n/a	8	0	1	4	1	0	0	0	1	1	7	2	0	18	44	18
Fareham Study Area - East	n/a	87	22	19	1	239	29	10	19	450	631	40	38	19	169	1773	709
Gosport	n/a	70	118	4	0	16	302	47	3	27	234	10	5	4	84	925	370
Stubbington Area	n/a	51	31	7	0	16	115	26	15	16	100	22	46	6	30	483	193
Core - East of Hamble	n/a	19	3	1	0	3	3	4	4	3	42	22	31	7	29	170	68
Rest of Core - East	n/a	50	24	28	3	346	50	11	12	2691	903	57	50	14	541	4781	1912
Portsmouth	n/a	204	220	88	3	602	554	126	91	1328	3515	140	98	45	1191	8207	3283
Rest of Core - Near West	n/a	56	21	37	4	28	30	12	16	35	130	2615	1106	533	1012	5637	2255
Inner Southampton	n/a	67	27	74	3	66	54	26	95	87	118	2082	1093	1439	1405	6636	2655
Rest of Core - Far West	n/a	8	2	13	0	12	3	3	10	12	30	638	817	1583	544	3673	1469
Non Core	n/a	154	105	145	38	202	204	45	96	833	1286	1944	1006	949	5177	12187	4875
Total (07:00-10:00)	n/a	1042	723	505	74	1632	1661	371	408	5568	7394	7732	4389	4639	10463	46600	
Total (08:00-09:00)	n/a	417	289	202	30	653	664	149	163	2227	2957	3093	1755	1856	4185		18640

Figure 4.6 PM PT Sectored Demand -Run 1 (Person Trips) (Ref: WC)

PM Peak period- Active	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)
Fareham SDA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fareham	n/a	3682	554	133	13	147	40	104	60	4	41	7		1	6	4794	1918
Fareham Study Area - South	n/a	460	2473	11	2	94	895	288	7	4	83	1		0	37	4356	1742
Fareham Study Area - West	n/a	153	9	1441	17	4	5	8	260	0	0	101	5	3	1	2007	803
Fareham Study Area - North	n/a	9	2	14	443	9	1	0	1	4	1	31			3	519	208
Fareham Study Area - East	n/a	115	95	3	14	7010	84	6	1	1090	1075	1			3	9497	3799
Gosport	n/a	14	568	0	0	39	7420	282	1	6	946	0		0	105	9383	3753
Stubbington Area	n/a	91	270	17	0	6	379	1473	20	0	12	0		0	31	2301	920
Core - East of Hamble	n/a	46	5	219	1	0	2	22	1262		0	170	7	15	13	1763	705
Rest of Core - East	n/a	1	2	0	2	805	12	0		18647	756	0			231	20456	8182
Portsmouth	n/a	16	60	0	0	849	1334	20	0	642	38089				149	41160	16464
Rest of Core - Near West	n/a	7	1	203	24	2	0	1	129	1		24715	2556	1134	202	28975	11590
Inner Southampton	n/a			7					5			2507	13072	1428	3	17023	6809
Rest of Core - Far West	n/a	0	0	1			0	0	5			1071	1752	20264	209	23304	9322
Non Core	n/a	4	23	1	3	3	110	30	8	225	125	291	5	263	262948	264041	105617
Total (07:00-10:00)	n/a	4600	4063	2050	521	8969	10282	2234	1761	20625	41129	28897	17398	23108	263942	429579	
Total (08:00-09:00)	n/a	1840	1625	820	208	3587	4113	894	704	8250	16451	11559	6959	9243	105577		171831

Figure 4.7 PM Active Mode Sectored Demand -Run 1 (Person Trips) (Ref: WC)

AM Peak period- Car	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	145	272	120	580	69	492	70	151	152	743	774	1101	181	163	264	5277	2016	4%
Fareham	154	1943	780	993	101	665	1014	695	580	746	632	849	88	281	851	10372	3962	4%
Fareham Study Area - South	65	840	977	299	30	201	1852	668	128	244	245	176	19	61	472	6277	2398	2%
Fareham Study Area - West	410	973	267	942	188	916	241	338	898	1309	1398	1915	260	322	1001	11380	4347	11%
Fareham Study Area - North	55	128	32	233	46	181	28	41	85	344	180	685	114	196	266	2615	999	1%
Fareham Study Area - East	314	793	219	511	143	3341	194	277	156	4891	3543	955	133	286	1932	17688	6757	8%
Gosport	78	1534	2649	558	50	307	3866	1442	204	328	375	282	32	106	1040	12851	4909	2%
Stubbington Area	93	1250	1273	473	46	271	1863	562	197	297	353	399	46	136	694	7953	3038	2%
Core - East of Hamble	189	904	283	1907	137	451	261	291	1931	619	909	1591	223	329	2249	12275	4689	5%
Rest of Core - East	553	1401	353	1144	285	6019	267	409	345	31721	7455	2660	420	1025	11528	65587	25054	14%
Portsmouth	692	623	214	754	95	3981	185	534	221	7452	34469	1062	174	458	6999	57915	22124	18%
Rest of Core - Near West	785	1220	273	2061	710	1572	197	446	1459	2454	1699	48962	8438	11393	14248	95920	36642	20%
Inner Southampton	144	102	23	221	61	129	13	81	187	200	167	6402	4276	5485	4091	21582	8244	4%
Rest of Core - Far West	71	450	98	491	127	490	68	61	211	714	650	10159	7227	25792	12011	58619	22393	2%
Non Core	138	977	369	967	183	2296	434	238	704	6485	6046	10545	5863	10268	82517	128032	48908	4%
Total (07:00-10:00)	3886	13411	7930	12135	2273	21312	10554	6237	7459	58546	58895	87746	27493	56302	140165	514343		100%
Total (08:00-09:00)	1484	5123	3029	4635	868	8141	4032	2382	2849	22365	22498	33519	10502	21507	53543		196479	
% from SDA	3%	5%	2%	11%	1%	9%	1%	3%	3%	14%	15%	21%	3%	3%	5%	100%		

Figure 4.8 AM Highway Sectored Demand -Run 5 (Person Trips) (Ref: YH)

AM Peak period- PT	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	89	82	21	10	4	114	33	7	1	53	608	34	54	10	48	1168	467	5%
Fareham	99	141	50	44	3	101	45	38	11	74	169	55	59	6	188	1084	434	6%
Fareham Study Area - South	50	84	41	10	0	19	85	22	2	22	150	21	17	1	103	627	251	3%
Fareham Study Area - West	13	46	3	41	1	22	4	8	2	48	75	48	76	12	193	592	237	1%
Fareham Study Area - North	7	5	0	3	8	1	0	0	0	0	6	7	3	0	47	87	35	0%
Fareham Study Area - East	129	45	10	11	1	301	16	13	2	310	588	29	54	15	196	1720	688	8%
Gosport	123	145	122	11	0	34	212	84	3	55	449	30	47	2	240	1558	623	7%
Stubbington Area	6	34	5	4	0	9	22	17	2	11	82	14	25	3	55	287	115	0%
Core - East of Hamble	2	30	1	7	0	10	1	12	4	36	51	11	95	6	132	398	159	0%
Rest of Core - East	103	45	24	20	1	434	25	16	8	2598	1167	32	81	27	965	5547	2219	6%
Portsmouth	883	262	61	26	1	477	102	62	5	653	2627	114	131	40	1522	6968	2787	52%
Rest of Core - Near West	52	106	4	47	10	44	11	21	22	54	167	2740	1990	672	2284	8223	3289	3%
Inner Southampton	92	30	2	45	1	17	2	41	35	47	121	1124	1109	705	1350	4721	1888	5%
Rest of Core - Far West	15	50	0	21	0	22	1	6	5	18	64	659	1424	1734	1152	5170	2068	1%
Non Core	54	155	38	104	16	188	75	28	32	570	1428	1120	1564	616	5517	11505	4602	3%
Total (07:00-10:00)	1714	1262	382	402	47	1793	633	376	133	4549	7752	6038	6729	3850	13993	49653		100%
Total (08:00-09:00)	686	505	153	161	19	717	253	150	53	1820	3101	2415	2692	1540	5597		19861	
% from SDA	8%	7%	2%	1%	0%	10%	3%	1%	0%	5%	52%	3%	5%	1%	4%	100%		

Figure 4.9 AM PT Sectored Demand - Run 5 (Person Trips) (Ref: YH)

AM Peak period- Active	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	715	538	62	169	37	85	13	15	4	2	3	5			0	1647	659	70%
Fareham	159	3698	356	120	8	82	7	76	38	1	11	6		0	3	4564	1826	15%
Fareham Study Area - South	25	552	3035	8	2	77	440	227	4	2	46	1		0	17	4436	1774	2%
Fareham Study Area - West	42	288	20	1419	10	3	0	21	285	0	0	424	11	1	0	2525	1010	4%
Fareham Study Area - North	17	32	2	17	469	47	0	0	1	2	0	28			2	618	247	2%
Fareham Study Area - East	34	150	79	3	10	6984	25	5	0	707	614	1			3	8618	3447	3%
Gosport	15	37	1080	4	1	78	7620	321	2	11	1913	0		0	89	11169	4468	1%
Stubbington Area	5	164	428	6	0	5	298	1607	24	0	18	1		0	24	2581	1032	1%
Core - East of Hamble	3	109	6	244	1	1	1	17	1612		0	105	5	9	6	2120	848	0%
Rest of Core - East	1	4	4	0	7	991	5	0		21146	561	1			219	22939	9176	0%
Portsmouth	6	33	66	0	1	852	704	8	0	752	40763				99	43284	17313	1%
Rest of Core - Near West	5	5	1	90	29	1	0	0	185	0		29365	2584	1176	328	33768	13507	0%
Inner Southampton				5					6			3618	13886	1903	5	19423	7769	0%
Rest of Core - Far West		1	0	2			0	0	52			1985	1175	21713	250	25180	10072	0%
Non Core	0	6	35	1	3	2	92	32	15	220	130	211	2	197	267596	268542	107417	0%
Total (07:00-10:00)	1027	5616	5175	2088	577	9207	9206	2331	2230	22842	44059	35752	17663	25000	268641	451415		100%
Total (08:00-09:00)	411	2247	2070	835	231	3683	3683	932	892	9137	17624	14301	7065	10000	107457		180566	
% from SDA	43%	33%	4%	10%	2%	5%	1%	1%	0%	0%	0%	0%	0%	0%	0%	100%		

Figure 4.10 AM Active Mode Sectored Demand - Run 5 (Person Trips) (Ref: YH)

PM Peak period- Car	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	294	216	89	554	91	489	96	135	239	715	933	954	152	62	155	5173	1852	5%
Fareham	248	1862	978	1084	108	1271	1842	1339	981	1495	1007	1487	150	450	1080	15384	5508	4%
Fareham Study Area - South	123	962	991	313	35	363	3148	1493	310	409	393	383	46	121	486	9576	3428	2%
Fareham Study Area - West	731	1318	352	1247	315	863	600	548	2182	1455	1269	3144	299	654	1209	16184	5794	12%
Fareham Study Area - North	99	128	37	249	63	213	54	50	158	357	144	886	86	177	250	2952	1057	2%
Fareham Study Area - East	568	844	240	882	225	3888	313	329	495	7643	6050	2172	237	622	2666	27174	9728	10%
Gosport	88	1400	2318	356	40	381	5177	2555	346	399	410	445	55	150	920	15041	5385	1%
Stubbington Area	179	1015	914	483	57	440	2128	825	415	549	719	688	115	124	507	9156	3278	3%
Core - East of Hamble	169	1073	234	1215	118	316	359	366	2129	488	447	2258	226	370	966	10736	3843	3%
Rest of Core - East	799	1294	396	1294	483	7066	490	425	693	37904	9237	3713	372	1007	9295	74467	26659	13%
Portsmouth	907	957	344	1166	231	5363	456	481	829	10567	44381	2366	314	783	8675	77820	27860	15%
Rest of Core - Near West	1148	1812	328	3193	794	1596	434	646	2383	3353	1970	59891	9160	13702	12303	112712	40351	19%
Inner Southampton	196	170	34	350	181	228	45	59	220	490	286	10528	6336	9424	6507	35055	12550	3%
Rest of Core - Far West	156	576	96	690	209	462	146	233	474	1098	740	15036	7891	32613	13973	74394	26633	3%
Non Core	257	1408	506	1439	319	2677	1135	841	1985	13129	8949	14797	5514	12951	106706	172615	61796	4%
Total (07:00-10:00)	5961	15036	7856	14516	3269	25615	16424	10325	13839	80052	76935	118747	30956	73211	165698	658439		100%
Total (08:00-09:00)	2134	5383	2813	5197	1170	9170	5880	3696	4954	28659	27543	42511	11082	26209	59320		235721	
% from SDA	6%	4%	2%	11%	2%	9%	2%	3%	5%	14%	18%	18%	3%	1%	3%	100%		

Figure 4.11 PM Highway Sectored Demand - Run 5 (Person Trips) (Ref: YH)

PM Peak period- PT	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	72	97	58	10	6	123	140	6	3	99	827	47	67	9	49	1611	644	6%
Fareham	89	143	87	53	8	82	163	41	36	51	229	91	40	20	109	1241	496	7%
Fareham Study Area - South	25	52	45	5	0	14	141	12	2	20	132	4	3	0	42	497	199	2%
Fareham Study Area - West	9	48	11	30	1	11	12	4	5	20	61	47	49	19	109	438	175	1%
Fareham Study Area - North	5	4	0	1	4	1	0	0	0	1	2	7	1	0	17	44	18	0%
Fareham Study Area - East	119	88	22	21	1	232	30	10	18	431	607	38	36	21	168	1841	736	9%
Gosport	47	71	112	4	0	16	285	44	3	24	217	10	2	4	83	923	369	4%
Stubbington Area	8	46	28	7	0	13	106	25	15	15	90	21	44	6	28	454	181	1%
Core - East of Hamble	1	16	3	1	0	2	3	4	4	3	41	21	30	7	28	165	66	0%
Rest of Core - East	53	50	23	30	3	327	48	10	12	2611	820	55	48	16	537	4643	1857	4%
Portsmouth	702	213	212	91	5	582	526	123	87	1251	3215	134	92	53	1153	8438	3375	55%
Rest of Core - Near West	33	50	21	37	4	26	30	11	16	34	117	2596	1088	554	1007	5624	2250	3%
Inner Southampton	68	63	26	73	3	59	54	25	93	85	111	2057	1075	1471	1397	6659	2663	5%
Rest of Core - Far West	12	7	2	13	0	11	3	3	10	12	29	643	822	1624	549	3740	1496	1%
Non Core	45	140	101	148	38	191	193	44	95	822	1194	1932	998	972	5168	12082	4833	4%
Total (07:00-10:00)	1287	1088	751	524	73	1692	1734	362	400	5477	7691	7702	4395	4777	10446	48399		100%
Total (08:00-09:00)	515	435	300	209	29	677	694	145	160	2191	3077	3081	1758	1911	4178		19360	
% from SDA	4%	6%	4%	1%	0%	8%	9%	0%	0%	6%	51%	3%	4%	1%	3%	100%		

Figure 4.12 PM PT Sectored Demand - Run 5 (Person Trips) (Ref: YH)

PM Peak period- Active	Fareham SDA	Fareham	Fareham Study Area - South	Fareham Study Area - West	Fareham Study Area - North	Fareham Study Area - East	Gosport	Stubbington Area	Core - East of Hamble	Rest of Core - East	Portsmouth	Rest of Core - Near West	Inner Southampton	Rest of Core - Far West	Non Core	Total (07:00-10:00)	Total (08:00-09:00)	% to SDA
Fareham SDA	1026	152	23	45	22	34	14	5	3	1	6	4			0	1337	535	70%
Fareham	227	3375	525	128	12	132	37	101	59	4	36	7		1	6	4650	1860	16%
Fareham Study Area - South	28	440	2427	11	2	91	870	284	7	4	81	1		0	36	4282	1713	2%
Fareham Study Area - West	76	143	8	1382	15	4	4	7	253	0	0	99	5	2	1	2001	800	5%
Fareham Study Area - North	35	8	2	12	431	8	1	0	1	4	1	30			3	536	215	2%
Fareham Study Area - East	46	104	92	3	13	6860	81	6	1	1070	1046	1			3	9325	3730	3%
Gosport	9	13	557	0	0	39	7275	278	1	6	919	0		0	105	9203	3681	1%
Stubbington Area	10	88	264	17	0	6	369	1450	20	0	12	0		0	31	2268	907	1%
Core - East of Hamble	2	46	5	215	1	0	2	22	1242		0	168	6	15	13	1737	695	0%
Rest of Core - East	1	1	2	0	2	791	11	0		18326	740	0			228	20102	8041	0%
Portsmouth	2	15	58	0	0	826	1293	20	0	627	37105				146	40092	16037	0%
Rest of Core - Near West	3	7	1	200	24	1	0	1	127	1		24577	2552	1162	201	28858	11543	0%
Inner Southampton				7					5			2499	12998	1440	3	16952	6781	0%
Rest of Core - Far West		0	0	1			0	0	5			1078	1752	20972	210	24019	9607	0%
Non Core	0	4	23	1	3	3	109	30	8	224	124	290	5	264	262928	264017	105607	0%
Total (07:00-10:00)	1465	4396	3989	2021	527	8795	10067	2206	1733	20267	40069	28756	17319	23857	263914	429380		100%
Total (08:00-09:00)	586	1759	1596	808	211	3518	4027	882	693	8107	16028	11503	6927	9543	105566		171752	
% from SDA	77%	11%	2%	3%	2%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	100%		

Figure 4.13 PM Active Mode Sectored Demand - Run 5 (Person Trips) (Ref: YH)

4.4 Emissions

4.4.1 Tables 4.5 to 4.9 show the forecast emissions (NOx, PM10, HC, CO, Carbon) from the four modelled scenarios. Emission outputs are provided for the modelled region as a whole and for Fareham District. The change in emissions as a result of the development is minimal.

Table 4-5 NOx Forecast Emissions (Kg/12hr)

	Run 1	Run 5	5 vs. 1 (Abs)	5 vs. 1 (%)
Whole Model	5,620	5,618	-2	-0.03%
Fareham District	529	536	6	1.19%

Table 4-6 PM10 Forecast Emissions (Kg/12hr)

	Run 1	Run 5	5 vs. 1 (Abs)	5 vs. 1 (%)
Whole Model	100	100	0	-0.07%
Fareham District	8	8	0	1.20%

Table 4-7 HC Forecast Emissions (Kg/12hr)

	Run 1	Run 5	5 vs. 1 (Abs)	5 vs. 1 (%)
Whole Model	3,132	3,133	2	0.06%
Fareham District	339	348	9	2.66%

Table 4-8 CO Forecast Emissions (Kg/12hr)

	Run 1	Run 5	5 vs. 1 (Abs)	5 vs. 1 (%)
Whole Model	36,431	36,397	-34	-0.09%
Fareham District	2,839	2,872	33	1.18%

Table 4-9 Carbon Forecast Emissions (Kg/12hr)

	Run 1	Run 5	5 vs. 1 (Abs)	5 vs. 1 (%)
Whole Model	2,080,262	2,079,808	-453	-0.02%
Fareham District	194,936	197,931	2,995	1.54%

5 Results - Road Traffic Model

5.1 Introduction

5.1.1 This chapter summarises the Road Traffic Model (RTM) outputs for the NCNF site, including forecast changes in flows and delays. The results include the following two scenarios:

- Run 1 – 2036 No Development at NCNF
- Run 5 – 2036 Full NCNF Development Quantum and Associated Infrastructure

5.2 Highway Network Performance

5.2.1 Tables 5.1 and 5.2 summarise key network statistics for the study area (as identified in Figure 5.1) as defined by FBC. Table 5.1 and 5.2 also summarise the journey times for the following routes (the routes are defined in Figure 5.2):

- Route 1 – N-S Wickham to Junction of A32/ Rowner Road (via A27);
- Route 2 – E-W Quay Street to M27 J9 (via A27); and
- Route 3 – E-W M27 J9 to M27 J12.

5.2.2 The performance of Run 5 is broadly similar to Run 1 except on the journey time comparison for Route 1 where there is a forecast 9.5% increase southbound in the AM and 16.5% increase northbound in the PM. Route 1 includes the length of A32 adjacent to the development site and includes the new proposed gyratory incorporating part of A32 and journey time impacts on Route 1 are therefore not unexpected. The north-west corner of the gyratory is identified as experiencing capacity problems and increased delay that would impact on the Route 1 journey time. Mitigation works at the NW corner and a general optimisation of the gyratory signal timings based on the SRTM output flows should reduce the Route 1 journey time for Run 5.

Table 5-1 AM Period (07:00-10:00) Study Area Network Statistics

Parameter			Run 1	Run 5	5 vs 1 (Abs)	5 vs 1 (%)
Vehicle Hr			101651	101731	80	0.1%
Vehicle Km			5300424	5301820	1397	0.0%
Average Speed (mph)			52.1	52.1	0.0	0.0%
Journey Time (mins)	Route 1	S/B	19.9	21.8	1.9	9.5%
		N/B	23.3	24.3	1.0	4.3%
	Route 2	E/B	13.6	13.3	-0.3	-2.2%
		W/B	13.7	13.2	-0.5	-3.6%
	Route 3	E/B	11.3	11.5	0.2	1.8%
		W/B	8.5	8.6	0.1	1.2%

Table 5-2 PM Period (16:00-19:00) Study Area Network Statistics

Parameter			Run 1	Run 5	5 vs 1 (Abs)	5 vs 1 (%)
Vehicle Hr			96675	96694	19	0.0%
Vehicle Km			5031252	5027694	-3558	-0.1%
Average Speed (mph)			52.0	52.0	0.0	0.0%
Journey Time (mins)	Route 1	S/B	22.7	23.9	1.2	5.3%
		N/B	21.2	24.7	3.5	16.5%
	Route 2	E/B	12.5	12.7	0.2	1.6%
		W/B	12.1	12.0	-0.1	-0.8%
	Route 3	E/B	9.6	10.1	0.5	5.2%
		W/B	9.2	8.9	-0.3	-3.3%

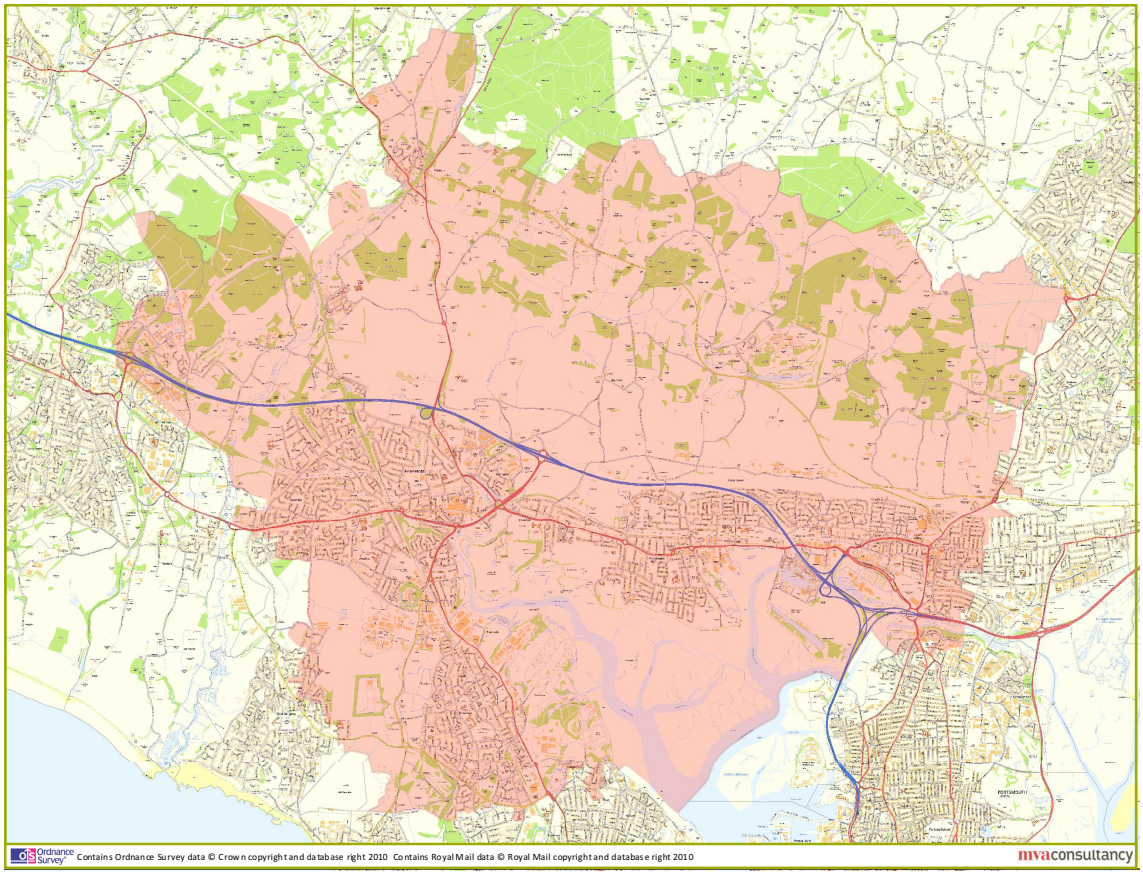


Figure 5.1 'Study Area'

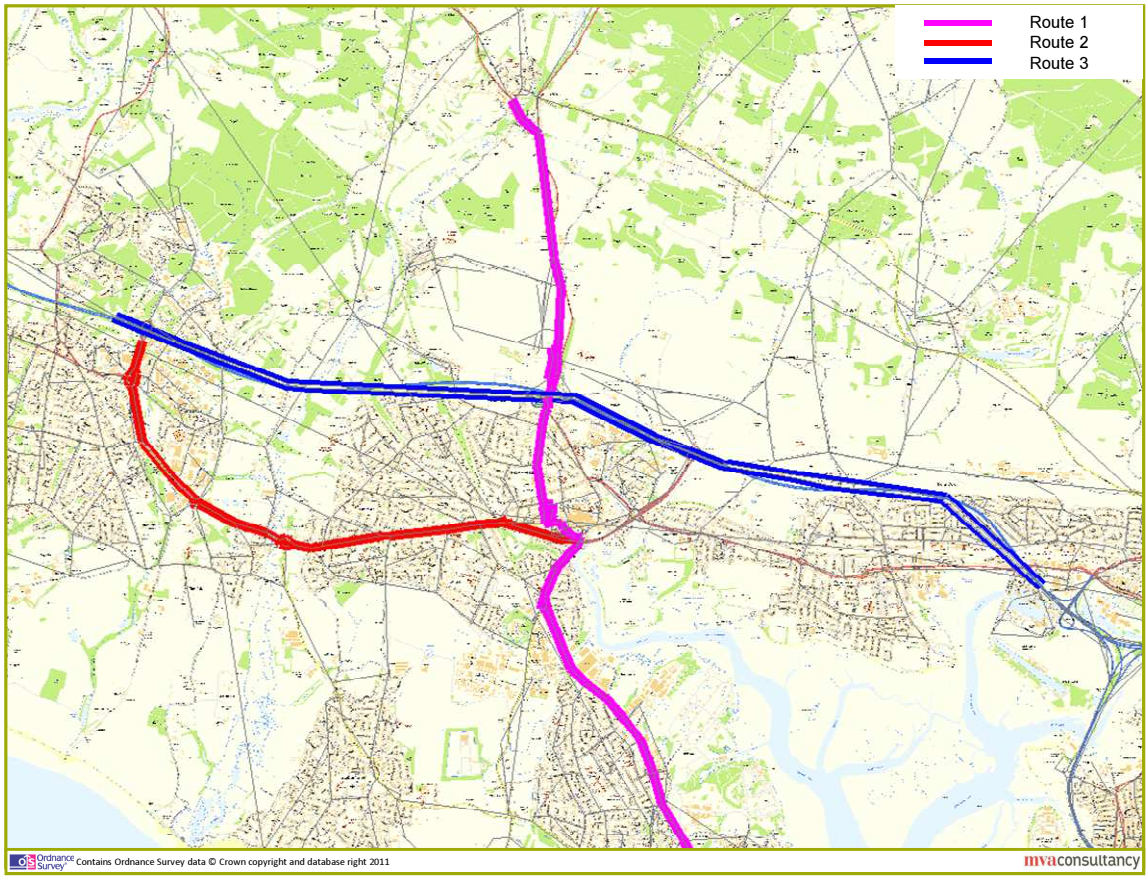


Figure 5.2 Journey Time Routes

5.3 Highway Link Flows, Delays and Capacity Hotspots

5.3.1 Figures 5.3 to 5.12 identify the change in traffic flows and link delay resulting from the NCNF. The non-development scenario (Run 1) has been compared to the full development scenario (Run 5). Where appropriate the wider area Figures included an inset that provides a zoomed in view of the network in the immediate vicinity to NCNF.

5.3.2 For the flow difference and link delay difference plots the absolute difference is identified adjacent to the appropriate link. For the flow plots the numbers represent PCUs and the delay plots the numbers represent the change in delay (in seconds) for each PCU. In addition, the scale of the change is represented graphically with the coloured lines of varying bandwidth. Blue lines identify a reduction compared to the non-development scenario and red lines an increase. The shade and thickness of the lines increase in proportion the scale of change between development and non-development scenarios. Only flow differences of 50 PCUs or greater and delay changes of 5s or more are displayed in the plots.

5.3.3 Figures 5.5 and 5.10 identify the highway movements solely related to the NCNF for the Run 5 AM and PM peaks respectively.

5.3.4 For the flow difference plots the most immediate observation is the net reduction in trips between junctions 10 and 11 of M27. This is due to the provision of the new west facing slips at J10 that remove the need for traffic joining/ exiting at J10 to perform a u-turn via J11 if originating or departing west of J10. In the AM peak there is a noticeable net increase in southbound trips on the A32 in to Fareham itself. There is a small reduction southbound from the Wickham direction on the A32. In the PM peak there is a significant net reduction in trips heading north on A32 towards Wickham possibly due to congestion and delay on the new A32 gyratory at the southern end of the scheme.

5.3.5 In terms of delay in the AM peak the NCNF infrastructure and network in the immediate vicinity performs relatively well with no major congestion issues. The junction performing closest to capacity is the NW corner of the new A32 gyratory with the left turn in to the development being the critical movement. In the PM peak the overall network again performs relatively well but the delay and congestion has increased at the NW corner of the new A32 gyratory compared to the AM with the left turn in to the development now over capacity. It should be noted that optimised signal timings for NCNF infrastructure produced by Linsig were only provided for the AM peak and a further optimisation of signal timings (external to SRTM) for the PM period may reduce the forecast delay in this period.

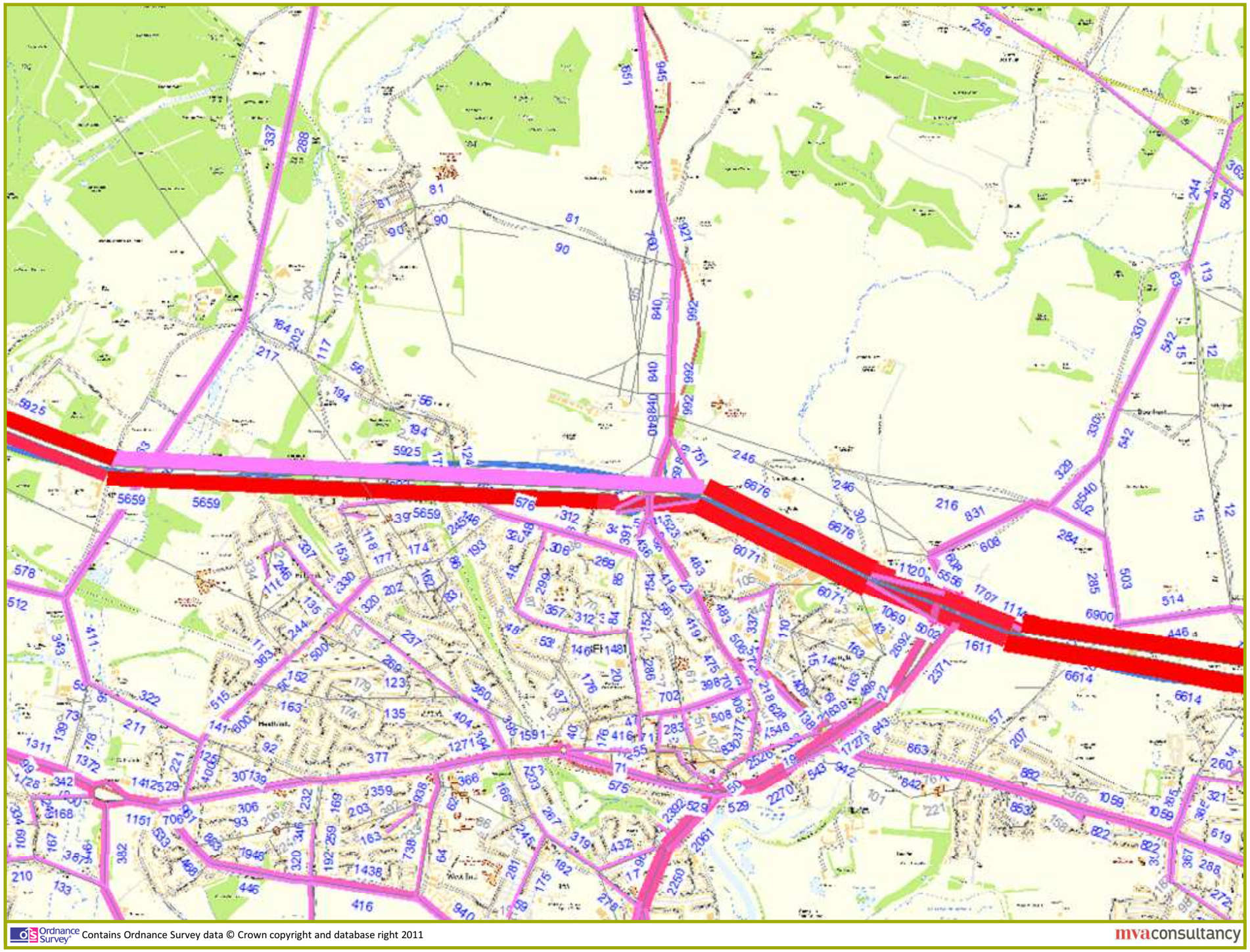


Figure 5.3 - AM Peak Total Flow (Run 1)

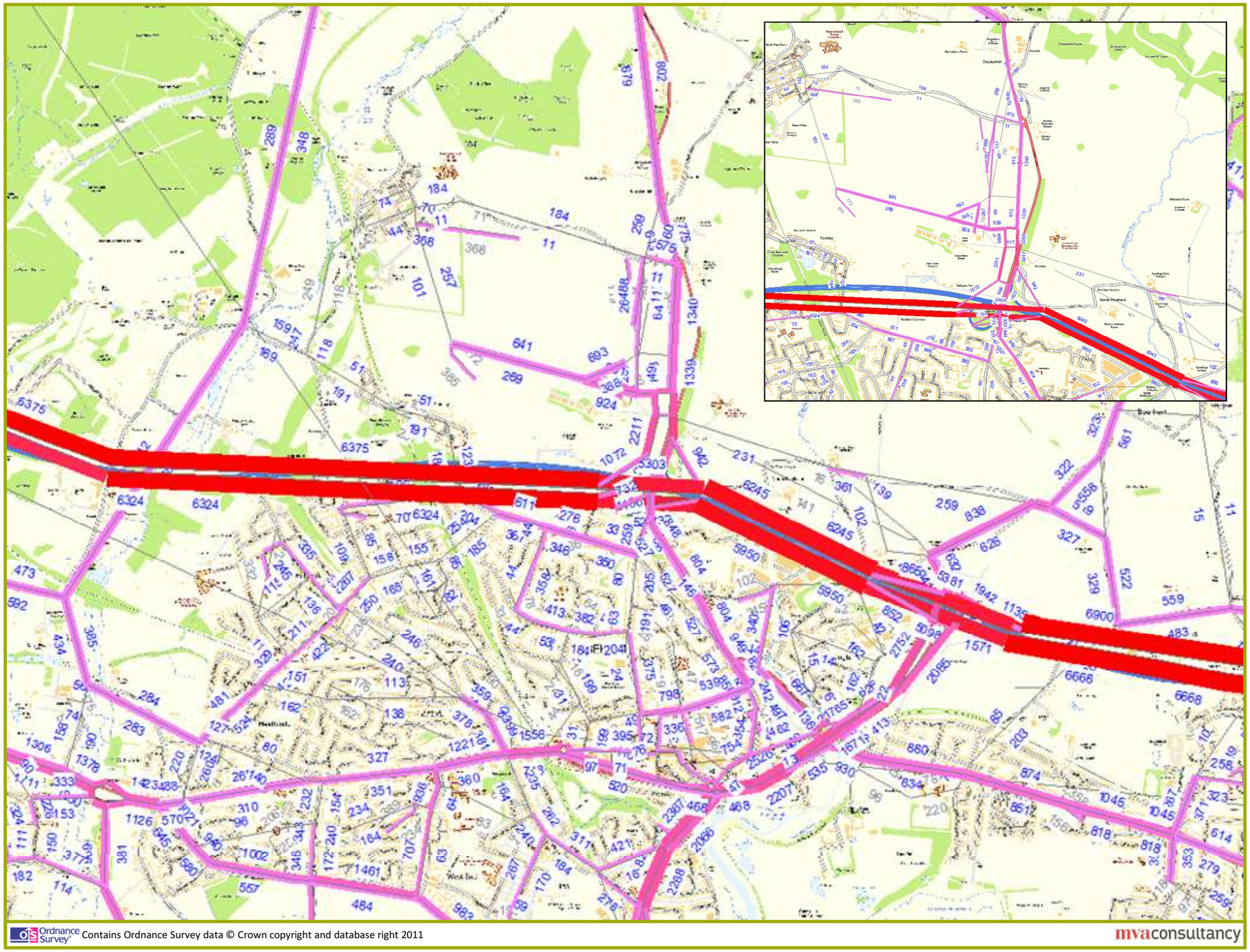


Figure 5.4 - AM Peak Total Flows (Run 5)

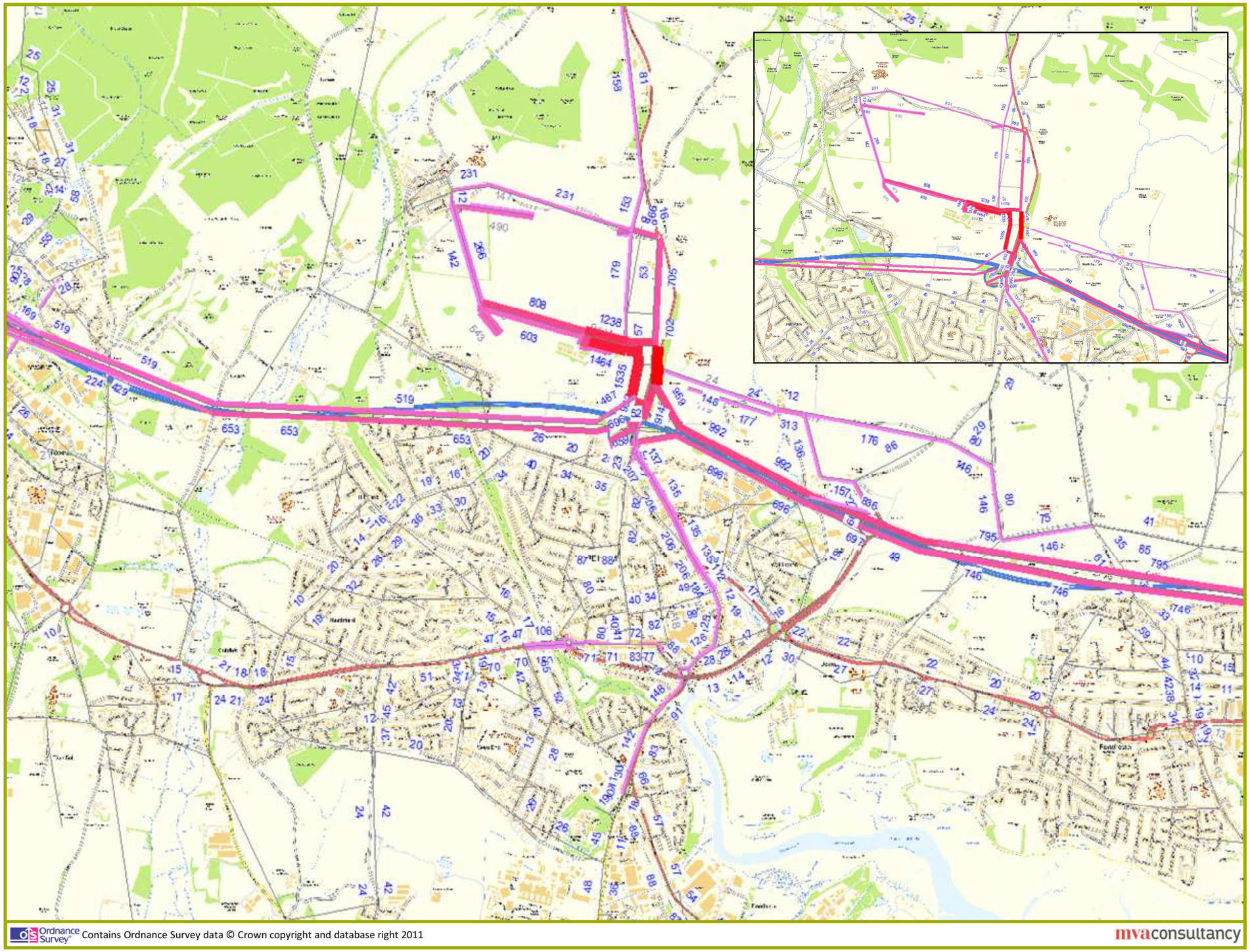


Figure 5.5 - AM Peak NCNF Only Flows (Run 5)

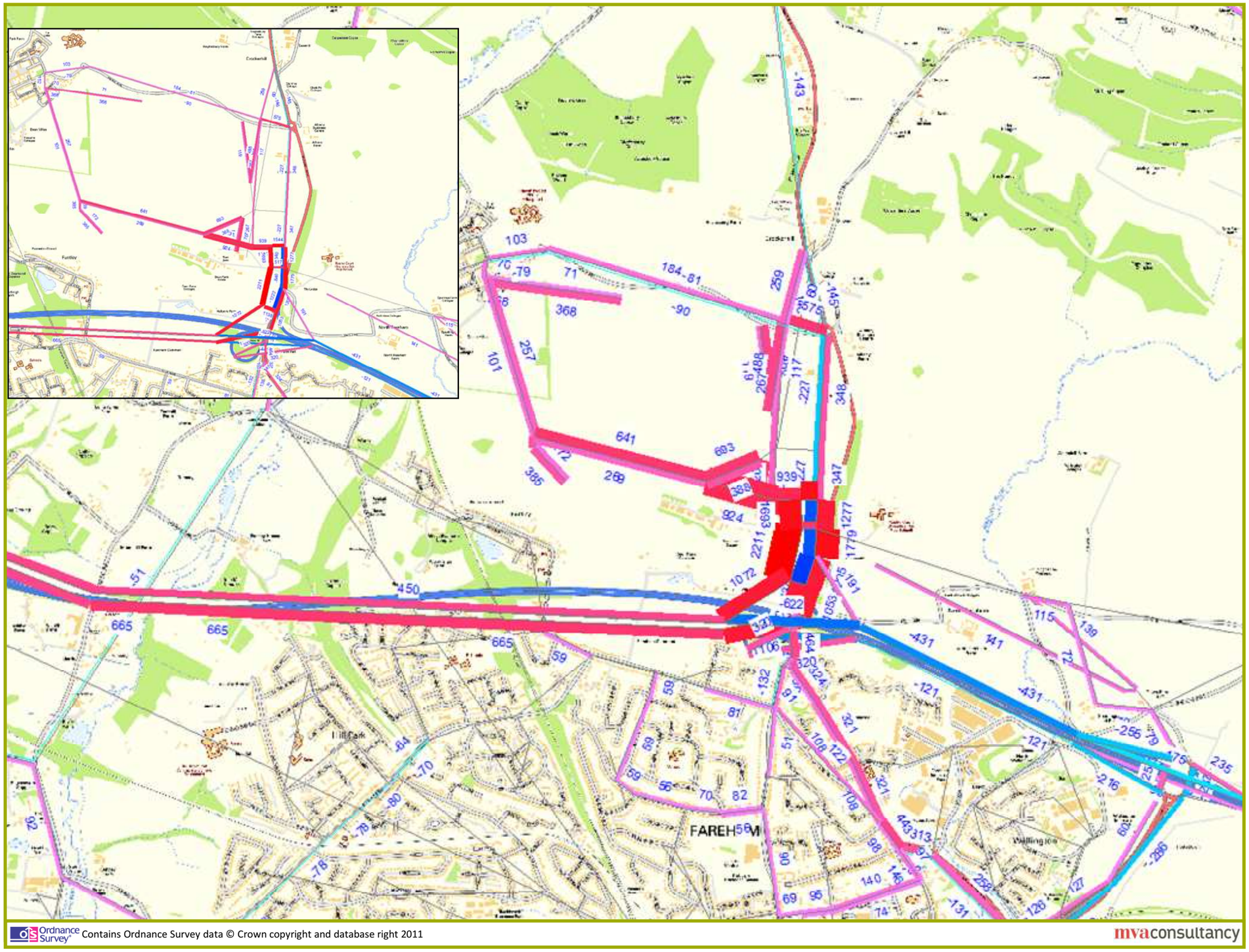


Figure 5.6 - AM Peak Flow Difference (Run 5 v Run 1)

Figure 5.7 - AM Peak Delay Difference (Run 5 v Run 1)

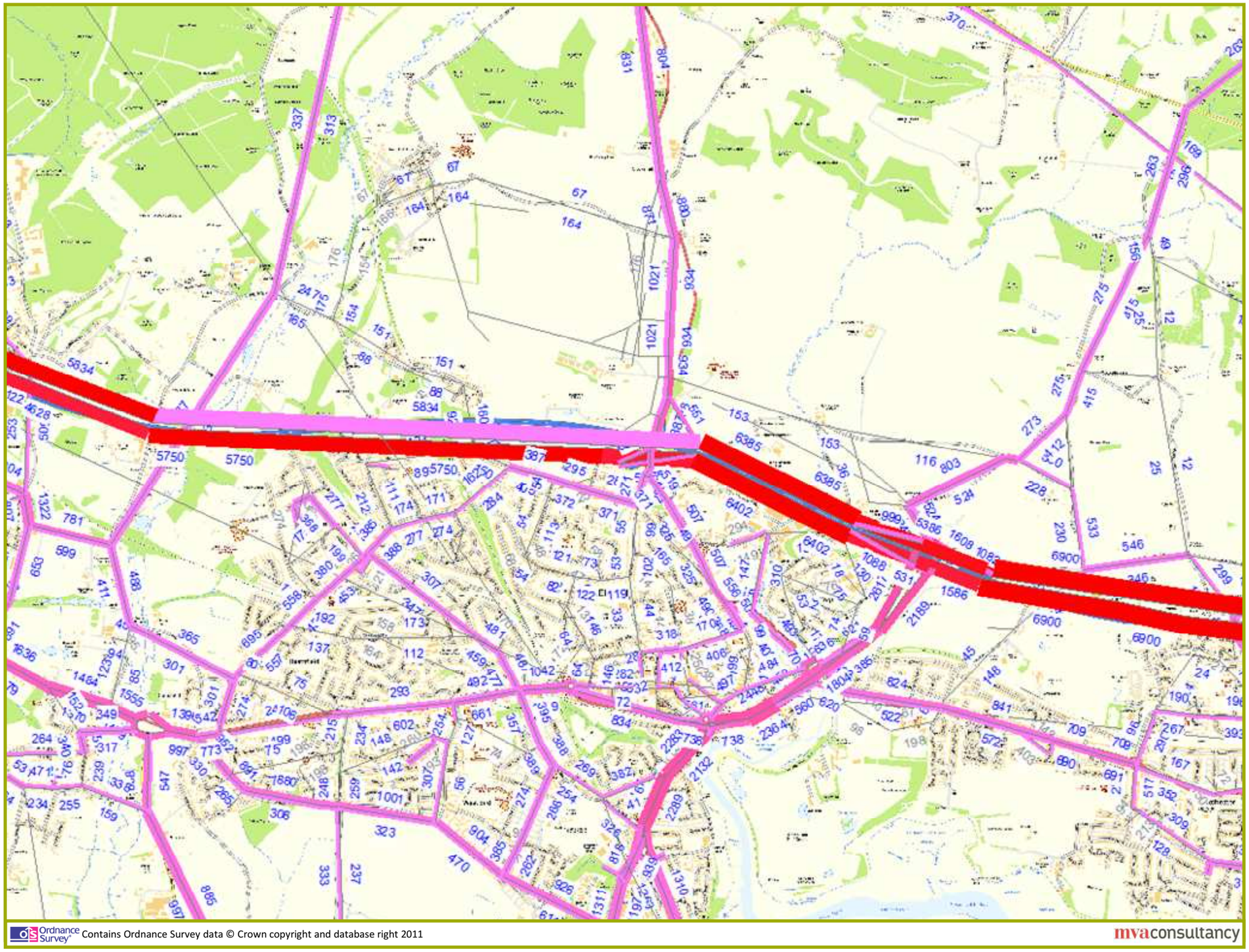


Figure 5.8 - PM Peak Total Flows (Run 1)

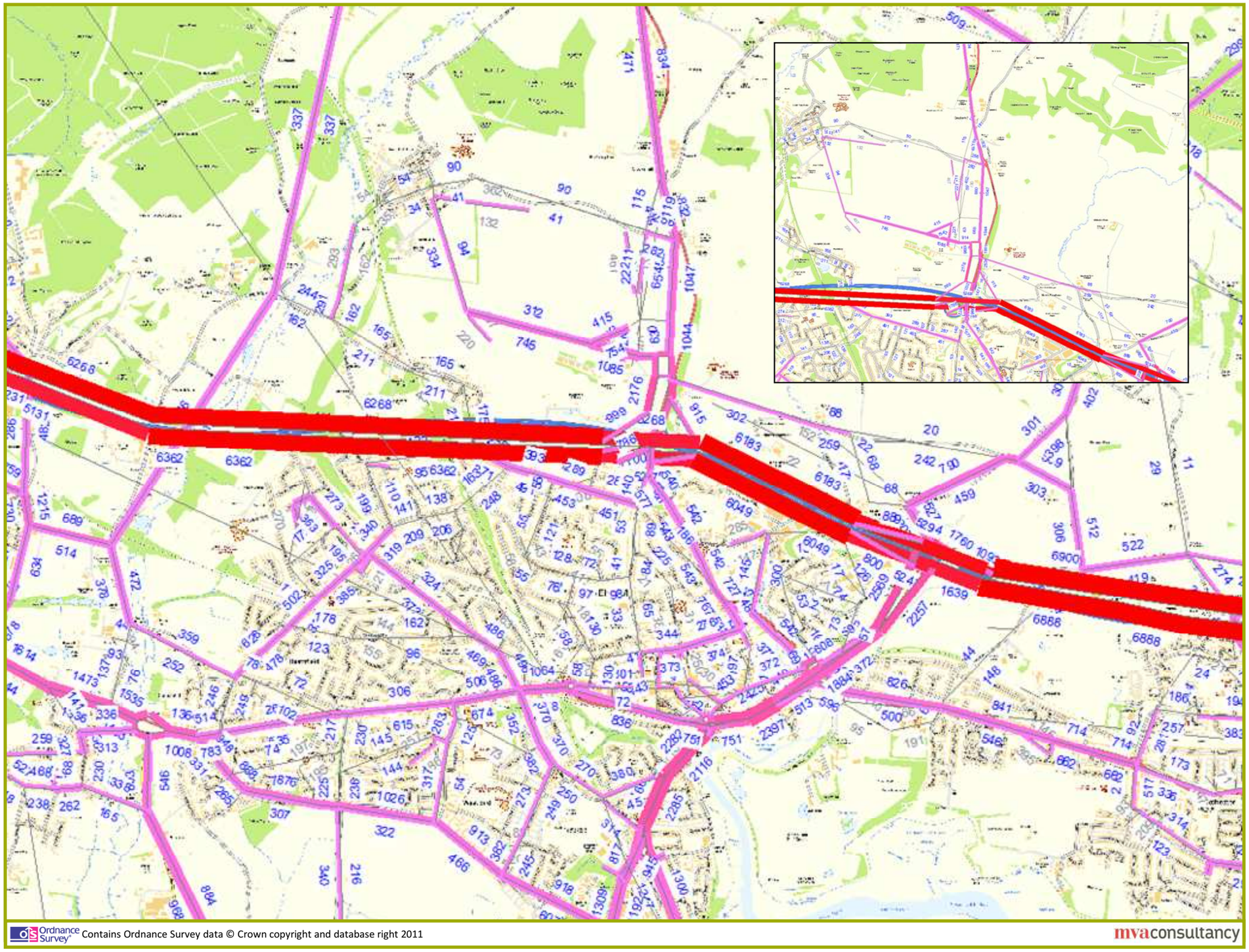


Figure 5.9 - PM Peak Total Flows (Run 5)

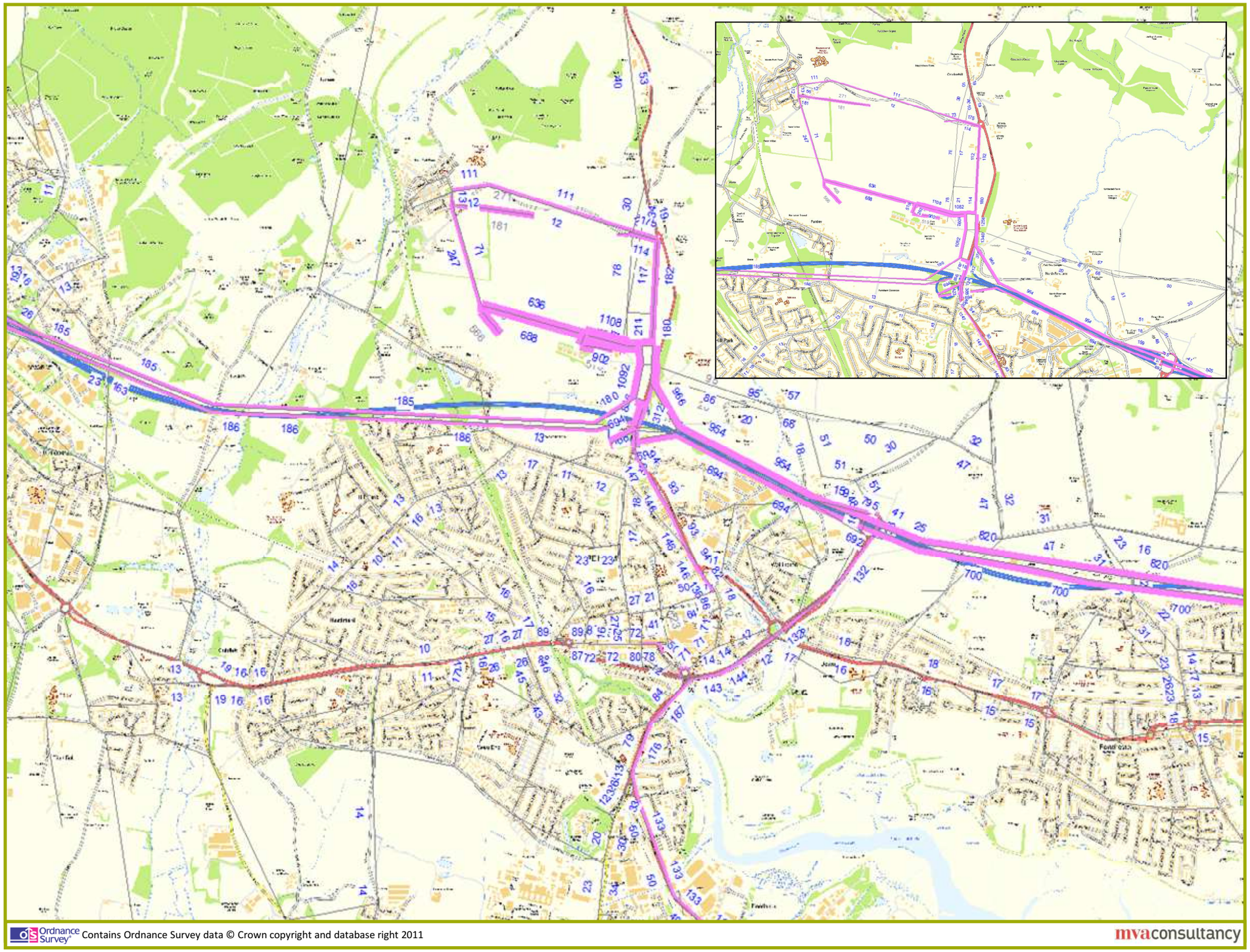


Figure 5.10 - PM Peak NCNF Only Flows (Run 5)

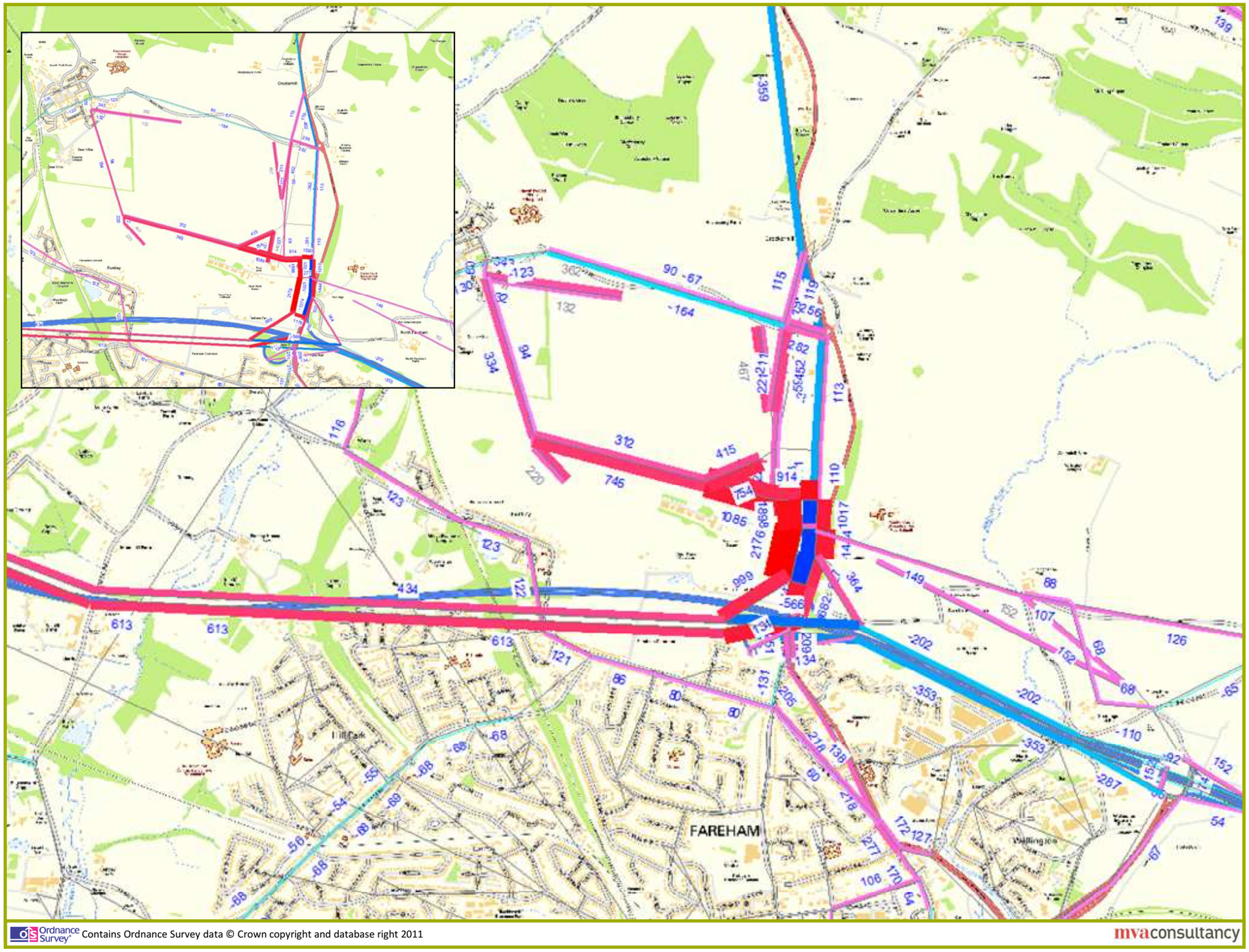


Figure 5.11 - PM Peak Flow Difference (Run 5 v Run 1)

Figure 5.12 - PM Peak Delay Difference (Run 5 v Run 1)

6 Results – Public Transport Model

6.1 Introduction

6.1.1 This chapter provides forecasts for the change in passenger numbers using Public Transport resulting from the NCNF.

6.2 Results

6.2.1 Figures 6.1 and 6.6 identify the forecast boardings, alightings and loadings (passengers per hour) for the AM peak on the three BRT services that access the NCNF in Run 5.

6.2.2 Figures 6.7 and 6.8 identify the passenger number changes (between Runs 1 and 5) for the AM and PM peak hours (0800-0900 & 1700-1800) respectively on the new services linking to the NCNF.

6.2.3 Both the boarding plots and the passenger number change plots highlight the high volume of PT trips associated to the NCNF that either originates or is destined for the wider Portsmouth area. The scheme proposals provide a high level of PT accessibility to the NCNF particularly from the Fareham and Portsmouth areas. The sectored demand in summarised in Section 4.3 identified over 50% of NCNF PT trips coming from or going to Portsmouth. The boarding and alighting plots identify a peak in activity at Fareham Rail Station that provides access to the wider rail network.

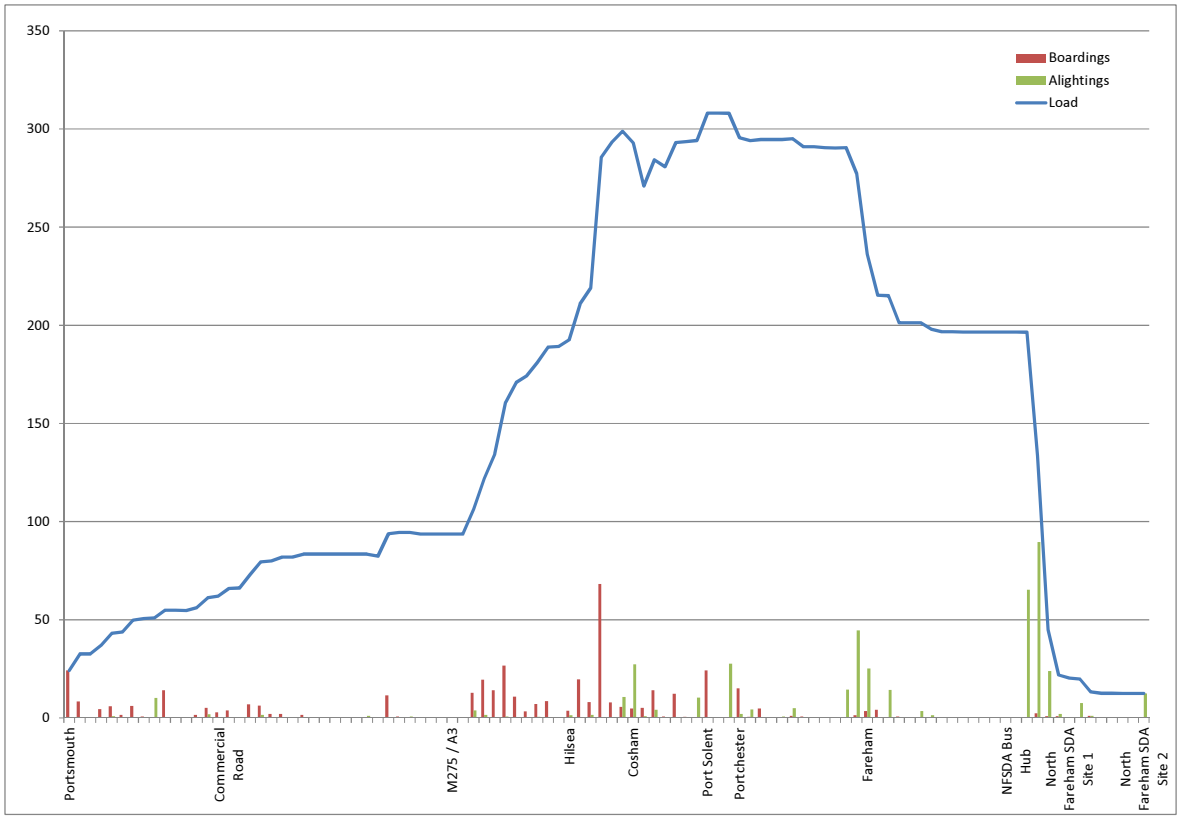


Figure 6.1 - AM Loadings for BRT Route Portsmouth to NCNF via A27 (Run 5)

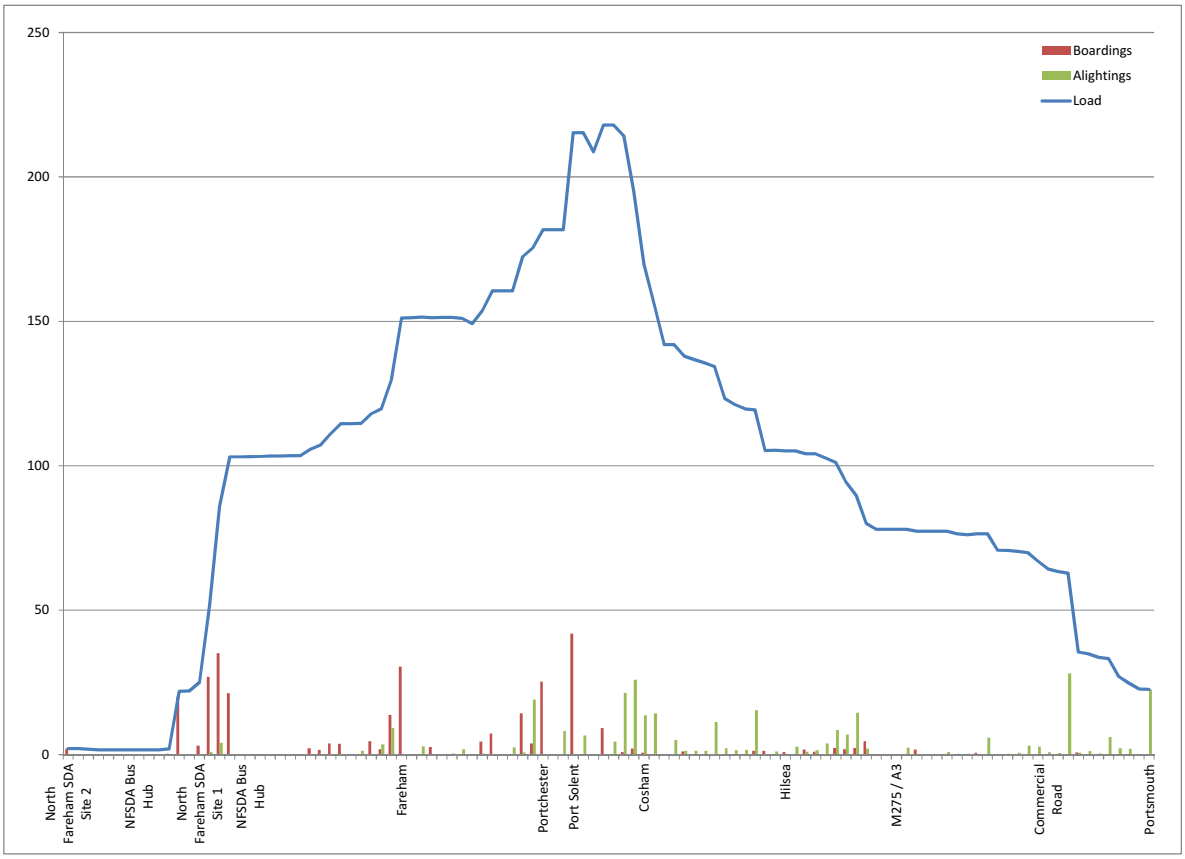


Figure 6.2 - AM Loadings for BRT Route NCNF to Portsmouth via A27 (Run 5)

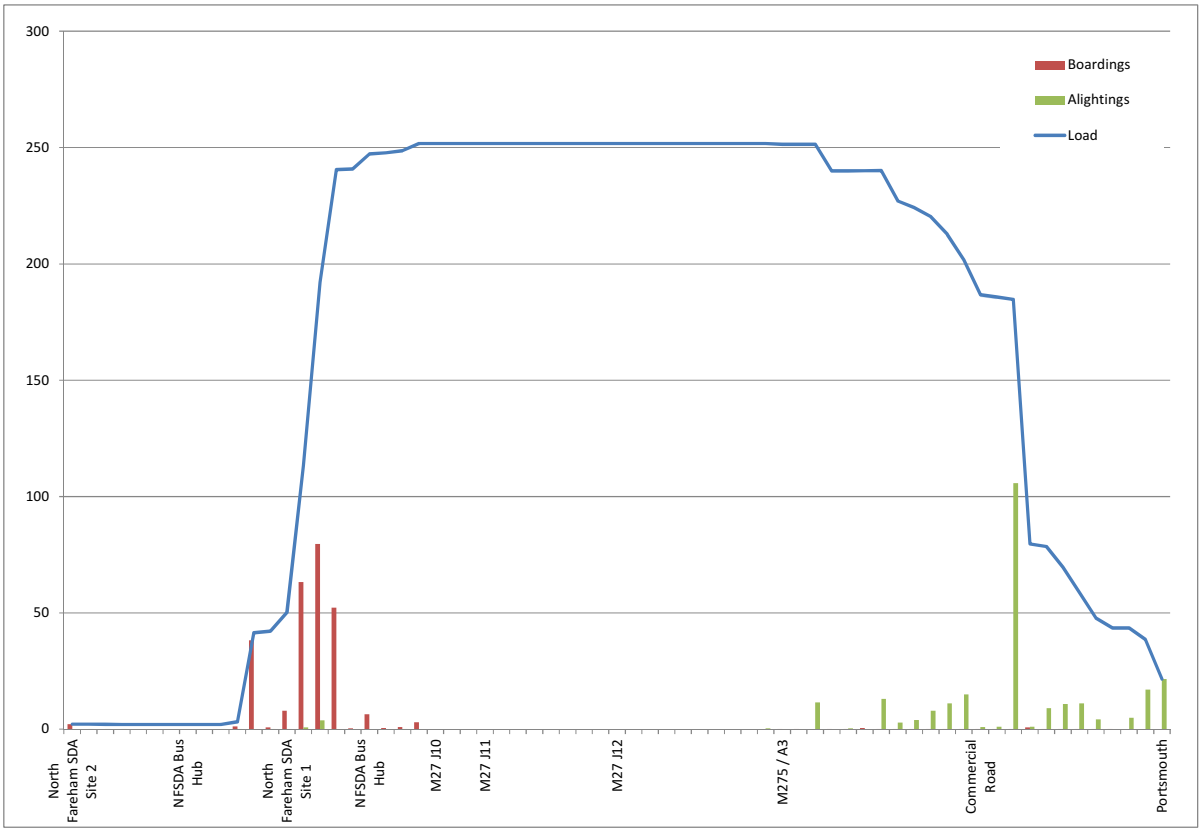


Figure 6.3 - AM Loadings for BRT Route NCNF to Portsmouth via M27 (Run 5)

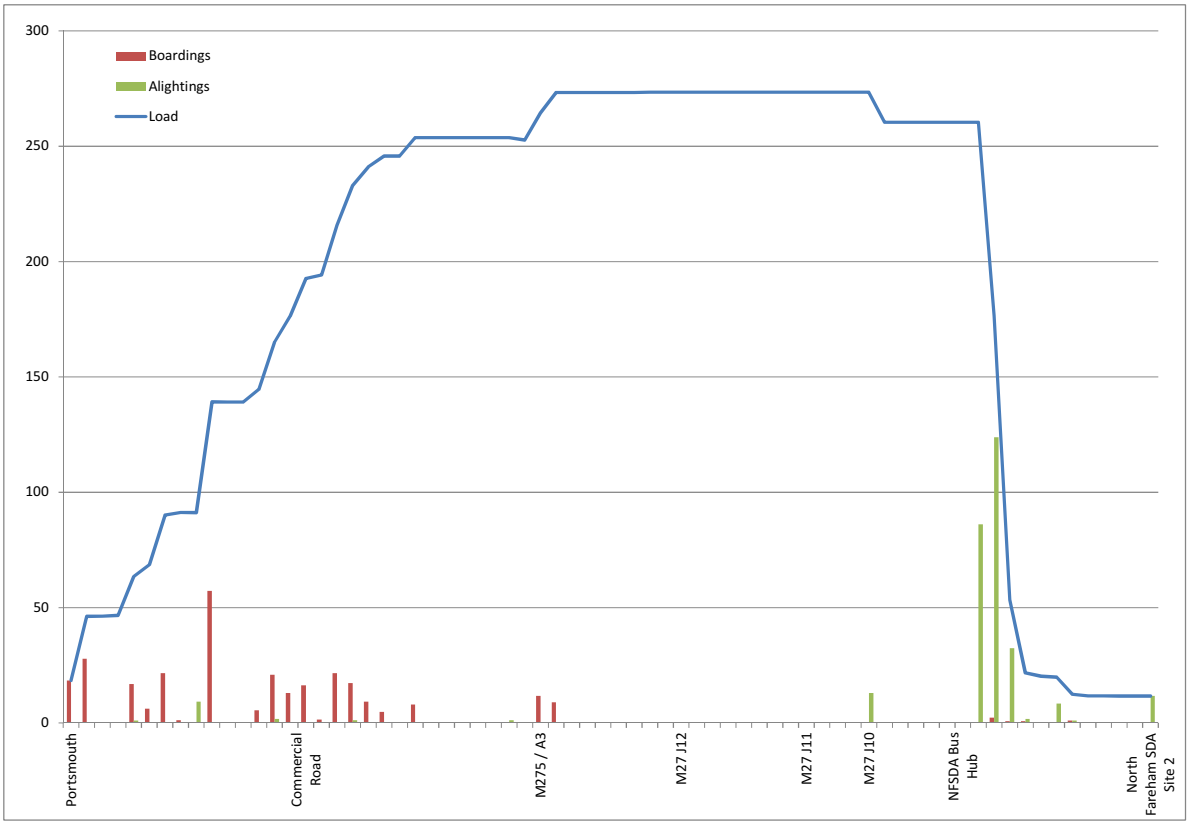


Figure 6.4 - AM Loadings for BRT Route Portsmouth to NCNF via M27 (Run 5)

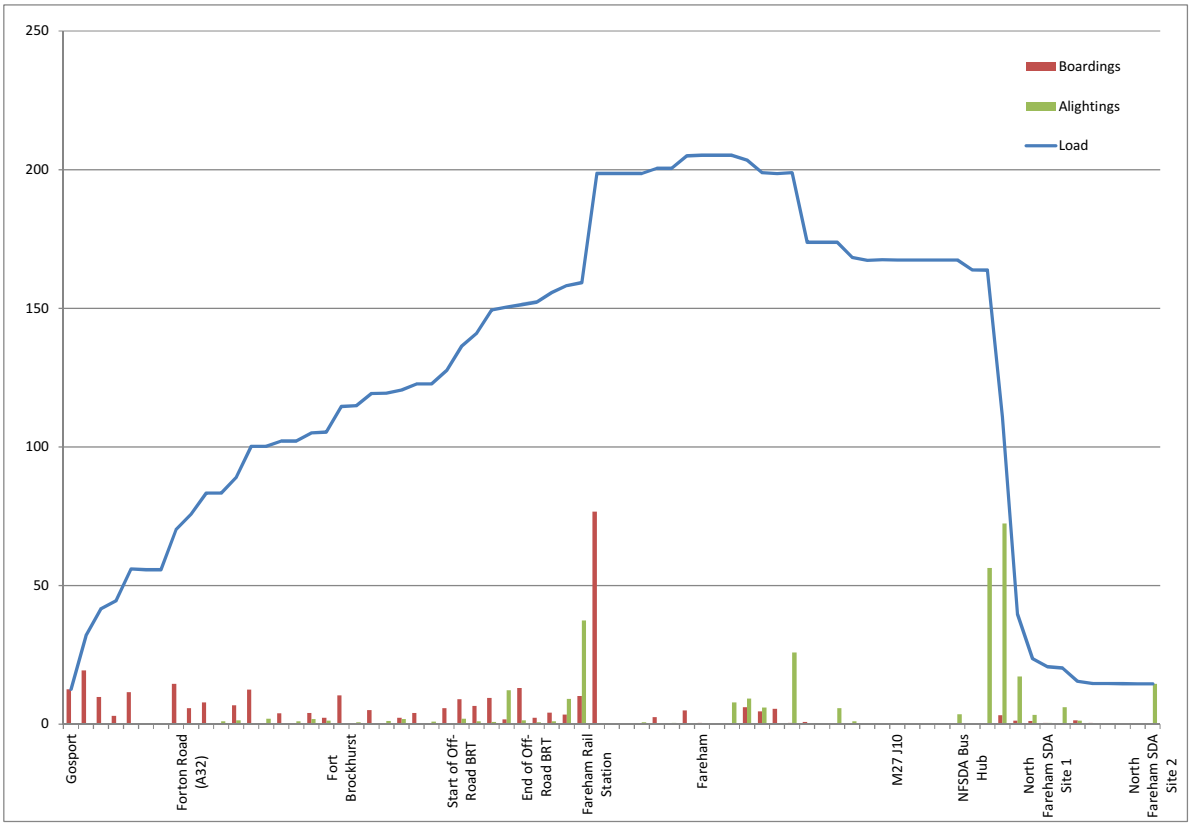


Figure 6.5 - AM Loadings for BRT Route Gosport to NCNF (Run 5)

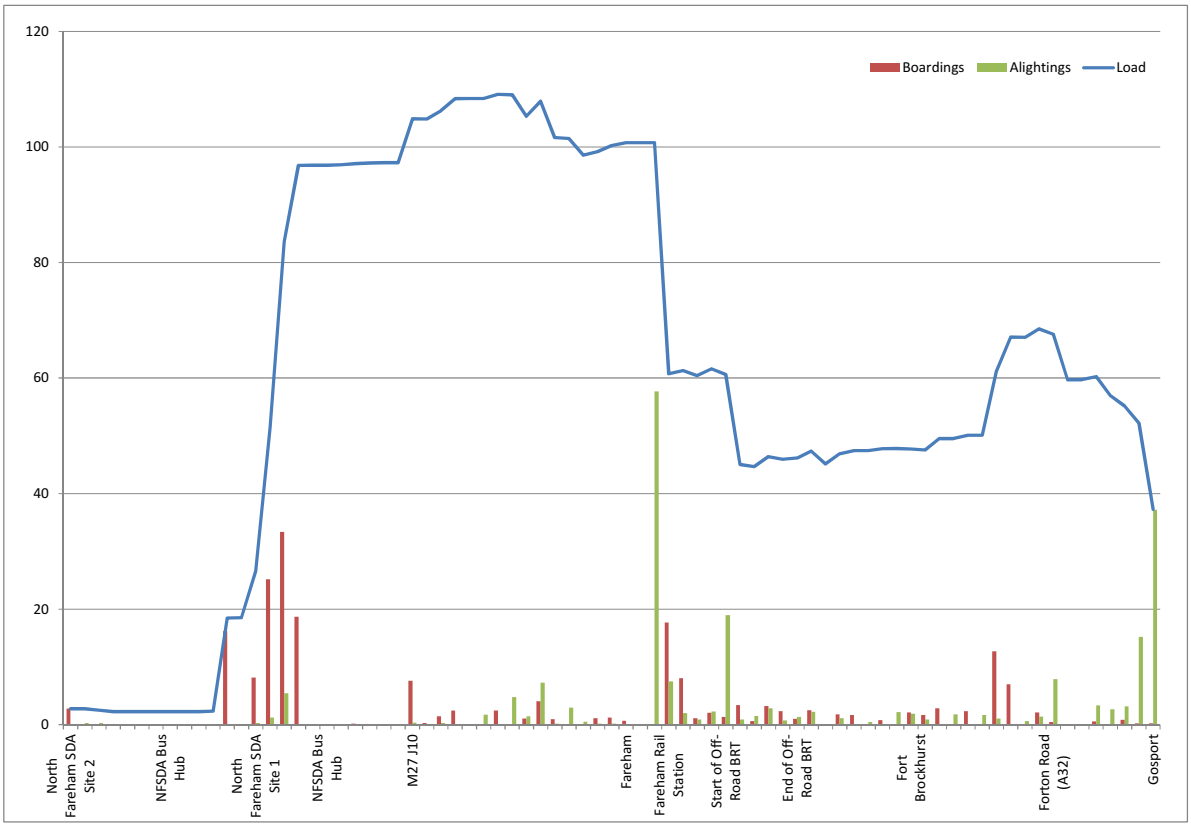


Figure 6.6 - AM Loadings for BRT Route NCNF to Gosport (Run 5)

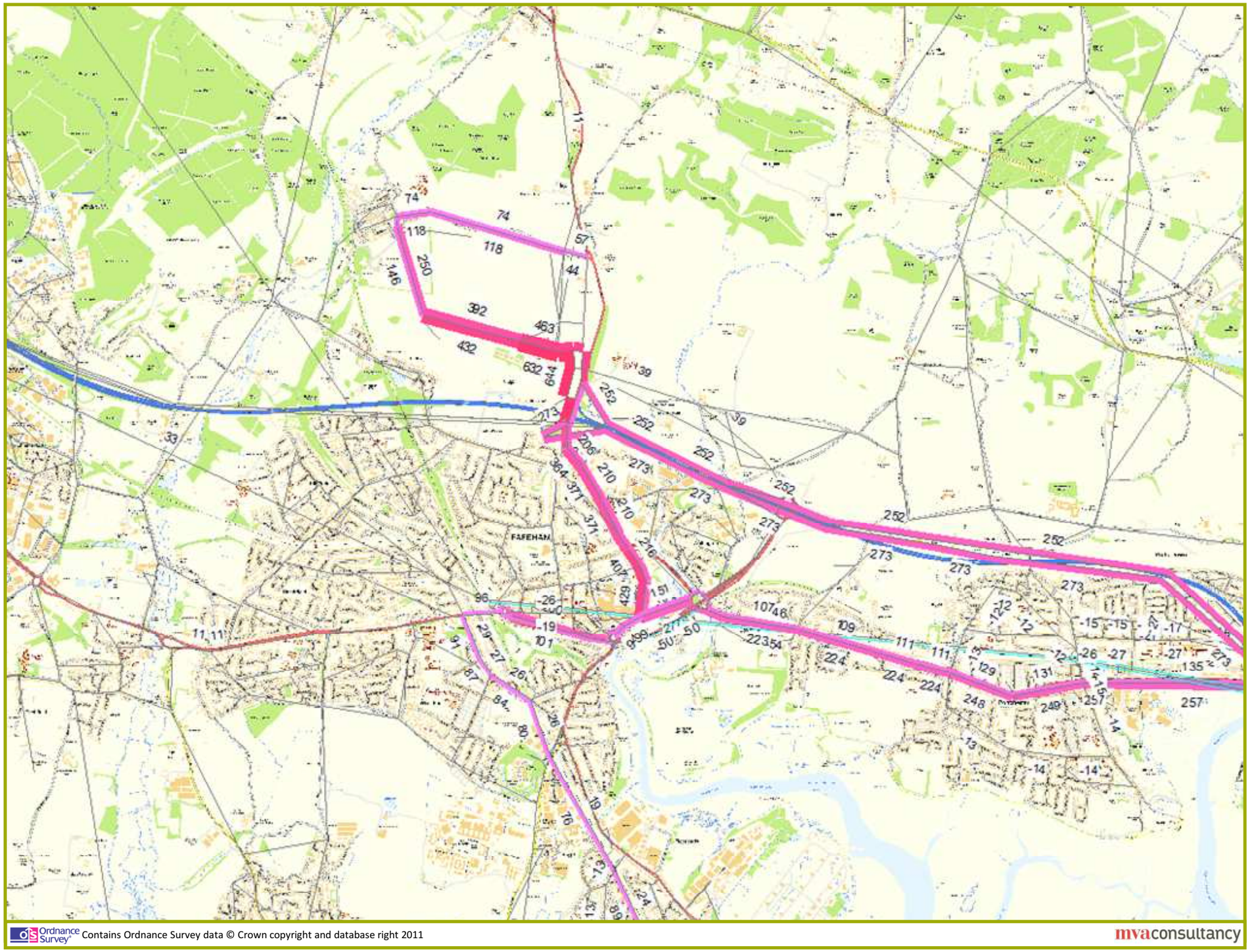


Figure 6.7 - AM Peak Change in Passenger Numbers (Run 5 v Run 1)

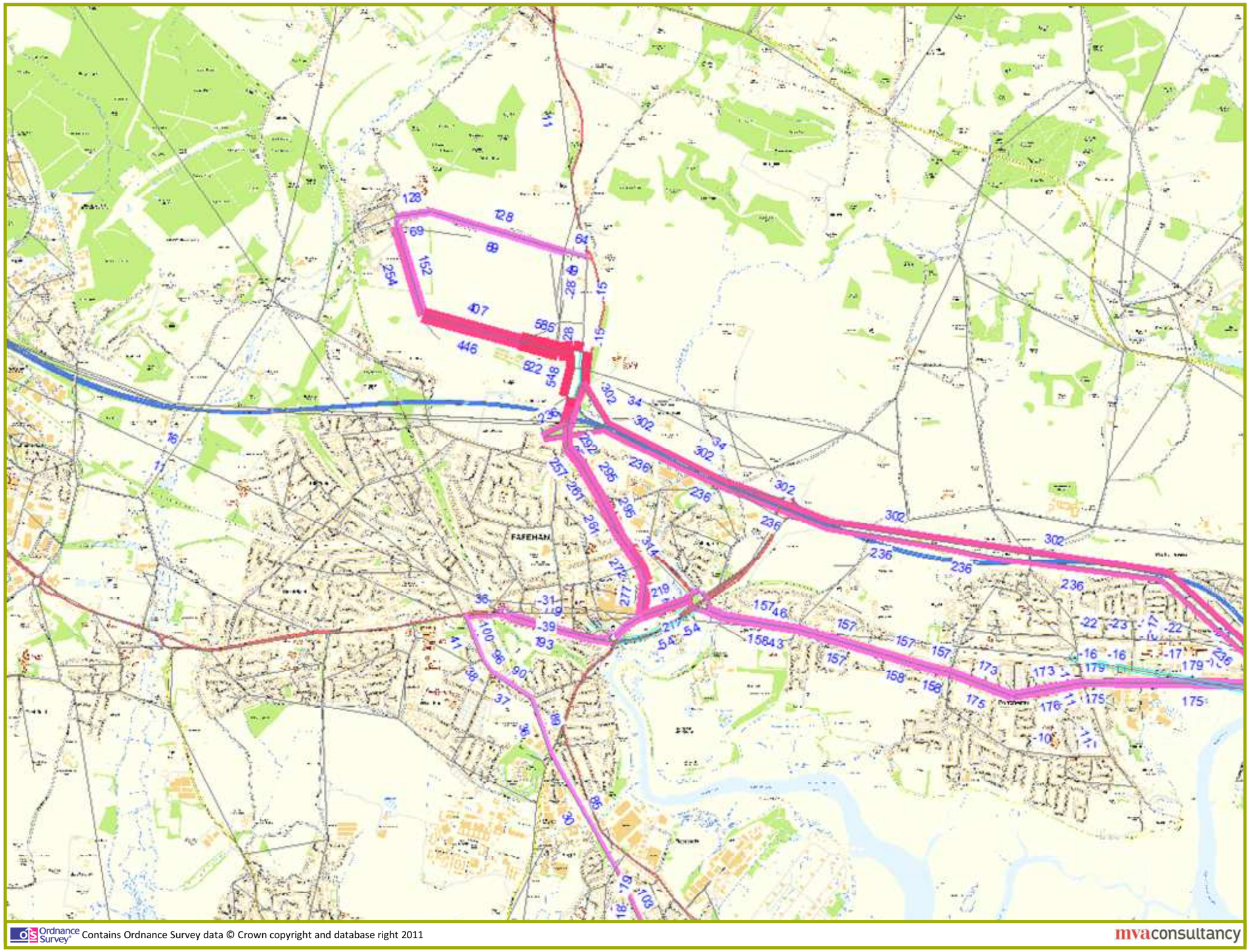


Figure 6.8 - PM Peak Change in Passenger Numbers (Run 5 v Run 1)

7 Summary

7.1 Summary

7.1.1 This Report summarises the impact of 6500 dwelling and a 5700 job employment centre forming the New Community North of Fareham. The associated highway infrastructure provides new west facing slips at M27 J10 making this junction all-movement. The design year represented is 2036.

7.1.2 The NCNF has good PT links and in addition to existing local services on A32 there are three BRT routes with direct access to the development. The BRT routes provide high quality PT provision to/ from Portsmouth, Fareham and Gosport and contribute to a relatively high forecast PT mode share at NCNF.

7.1.3 Overall the highway network performs relatively well with only the north-west corner of the new A32 gyratory south of the development being highlighted as suffering capacity problems. Further investigation (using detailed modelling software e.g. Linsig, Arcady etc.) of the operational performance of the junction arrangements proposed as part of the NCNF to inform scheme mitigation is recommended based on the forecast flows output by SRTM. In particular, signal timing optimisation is recommended on the output model flows for the NCNF gyratory (utilising the Linsig model developed by PB). Based on current SRTM model outputs we believe that with refinement the network can be demonstrated to operate acceptably.

7.1.4 The new west facing slips at M27 J10 reduce the pressure on the motorway section between junctions 10 and 11 by removing the need for u-turns to be performed at J11 to access J10 from the west.

7.1.5 The change in emissions between the 'with' and 'without' NCNF scenarios for Fareham District and the model as a whole are small.

Appendix A – SRTM Base Year (2010) M27 J9-J12 Validation

Table.1 M27 SRTM AM Validation between Junctions 9 to 12

Dir	Section	Observed	Modelled	Abs Diff	% Diff	GEH
Eastbound	J9-J10	4637	4610	-27	-1%	0.4
	J10-J11	5316	5380	64	1%	0.9
	J11-J12	5963	5986	22	0%	0.3
Westbound	J12-J11	5160	5123	-36	-1%	0.5
	J11-J10	4654	4693	40	1%	0.6
	J10-J9	4273	4311	38	1%	0.6

Table.2 M27 SRTM PM Validation between Junctions 9 to 12

Dir	Section	Observed	Modelled	Abs Diff	% Diff	GEH
Eastbound	J9-J10	4379	4305	-74	1.7%	1.1
	J10-J11	4858	4863	4	0.1%	0.1
	J11-J12	5157	5017	-141	-2.7%	2.0
Westbound	J12-J11	5440	5320	-120	-2.2%	1.6
	J11-J10	4983	4904	-79	-1.6%	1.1
	J10-J9	4311	4312	1	0.0%	0.0

Appendix B – SRTM Reference Case Committed Schemes

Current Reference Cases as at June 2012:

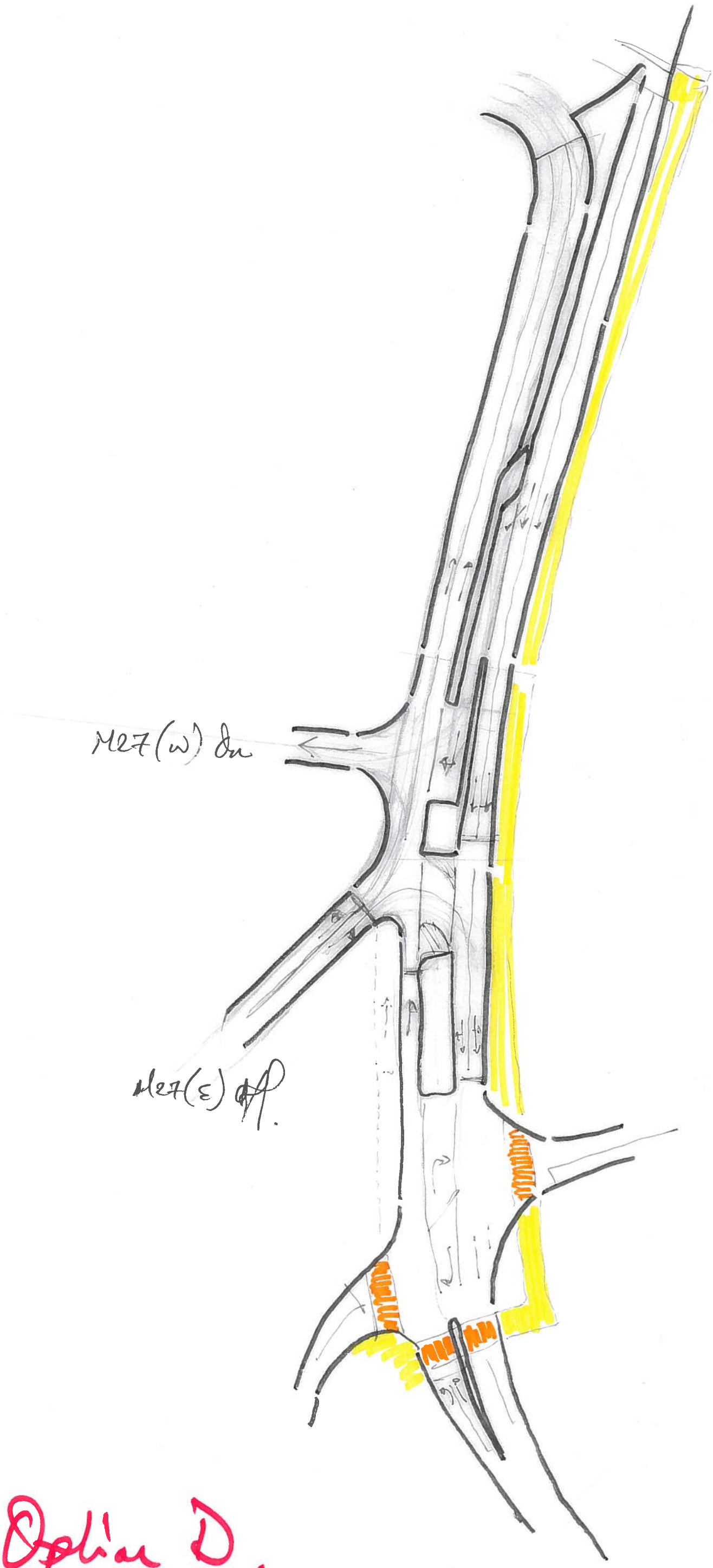
Note: Only committed (funded) Highway/ PT schemes are included in the Reference Cases

Model	Major Developments	Major Highway Schemes	Major PT Schemes
2010 Base	Existing 2010	Existing 2010	Existing 2010
2014 Ref	As 2010 Base plus: 1. Initial Whitehill / Bordon Eco-Town 2. Initial West of Waterlooville MDA 3. Initial Bushfield Camp, Winchester 4. Initial Daedalus 5. Initial North Whiteley 6. Initial Tipner 7. Initial Fareham SDA 8. Initial Eastleigh Riverside	As 2010 Base plus: 1. Quay Street Roundabout (Fareham) – Full signalisation of roundabout and 'through lane' from A32 to A27. 2. Newgate Lane (Fareham) - Widening (to 7.3m) from Speedfield Retail Park access roundabout southwards to Peel Common roundabout. 3. Totton Western Bypass / A326 – Existing roundabout at junction of A326/A336 converted to traffic signal control. 4. A3M J5 Bedhampton Road Junction (Rusty Cutter) – Junction improvement including additional lanes on A3M S/B Off Slip; Bedhampton Hill W/B; Havant Rd E/B; A27 E/B link; North, East and South circulating arms on the roundabout. 5. Trafalgar Gate Link Road – New highway link between A3 Mile End Road to Trafalgar Gate (naval base). 6. M27 J3 – 10% increase to junction circulating lane capacity. 7. M3 J12 – Additional lane on S/B off-slip. 8. Eastern Rd/ Fitzherbert Rd/ Grove Rd junctions – Revised signal timings to improve capacity. 9. New Road/ Tangier Road area improvement scheme – Speeds on Tangier Rd and New Rd reduced to 20mph. 10. Copnor Road area improvement scheme (Portsmouth) –	As 2010 Base plus: 1. Fareham – Gosport BRT Phase 1A 2. Isambard Brunel Rd Bus Priority – S/B bus lane between Station Rd and Winston Churchill Ave.

Model	Major Developments	Major Highway Schemes	Major PT Schemes
		Pedestrian facilities at Copnor Road/ Stubbington Ave junction. Reduce speed to 20mph on section of Copnor Road. 11. Elm Grove/ Albert Road junction - Pedestrian facilities provided at junction. 12. Eastern Road (Portsmouth) congestion improvement scheme – Additional S/B lane between Hayling Ave and Kirpal Rd, amendments to signal junction with Milton Rd. 13. Portswood Rd/ St Denys Rd/ Highfield Ln junction modifications – Improved pedestrian crossing facilities and signal timing changes associated to Sainsburys development. 14. Maybush Corner (Junction of Romsey Rd/ Wimpson Ln/ Rownhams Ln) – Additional approach lane added to Wimpson Lane and traffic signal timing adjustments. 15. Civic Centre Place – Access to Civic Centre Rd between Portland Terr and Above Bar St restricted to bus only. Increased pedestrian provision at Havelock Rd/ Western Esplanade and Portland Terr/ Civic Centre Rd signal junctions. 16. M271 Redbridge Roundabout – Pedestrian crossing facility incorporated into existing signal junction where A33 E/B off slip joins roundabout. Assumed small reduction in highway capacity at roundabout due to provision of cycle facilities.	
2019 Ref	As Central 2014 Reference plus: 1. Additional Whitehill / Bordon Eco-Town 2. Additional West of Waterlooville MDA	As Central 2014 Reference plus: 1. Platform Road (Southampton) – Platform Rd, Orchard Place and Queens Terrace converted to two-way operation; Queens Terrace closed at eastern end. New signal junction at Platform Rd/ Dock Gate 4.	As Central 2014 Reference

Model	Major Developments	Major Highway Schemes	Major PT Schemes
	3. Additional Bushfield Camp, Winchester 4. Additional Daedalus 5. Additional North Whiteley 6. Additional Tipner 7. Additional Fareham SDA 8. Additional Eastleigh Riverside 9. Initial other Eastleigh strategic sites		
2026 Ref	As Central 2019 Reference plus: 1. Additional Whitehill / Bordon Eco-Town 2. Additional West of Waterlooville MDA 3. Additional Bushfield Camp, Winchester 4. Additional Daedalus 5. Additional North Whiteley 6. Additional Tipner 7. Additional Fareham SDA 8. Additional Eastleigh Riverside 9. Additional other Eastleigh strategic sites	As Central 2019 Reference	As Central 2014 Reference
2036 Ref	As Central 2026 Reference	As Central 2026 Reference	As Central 2014 Reference

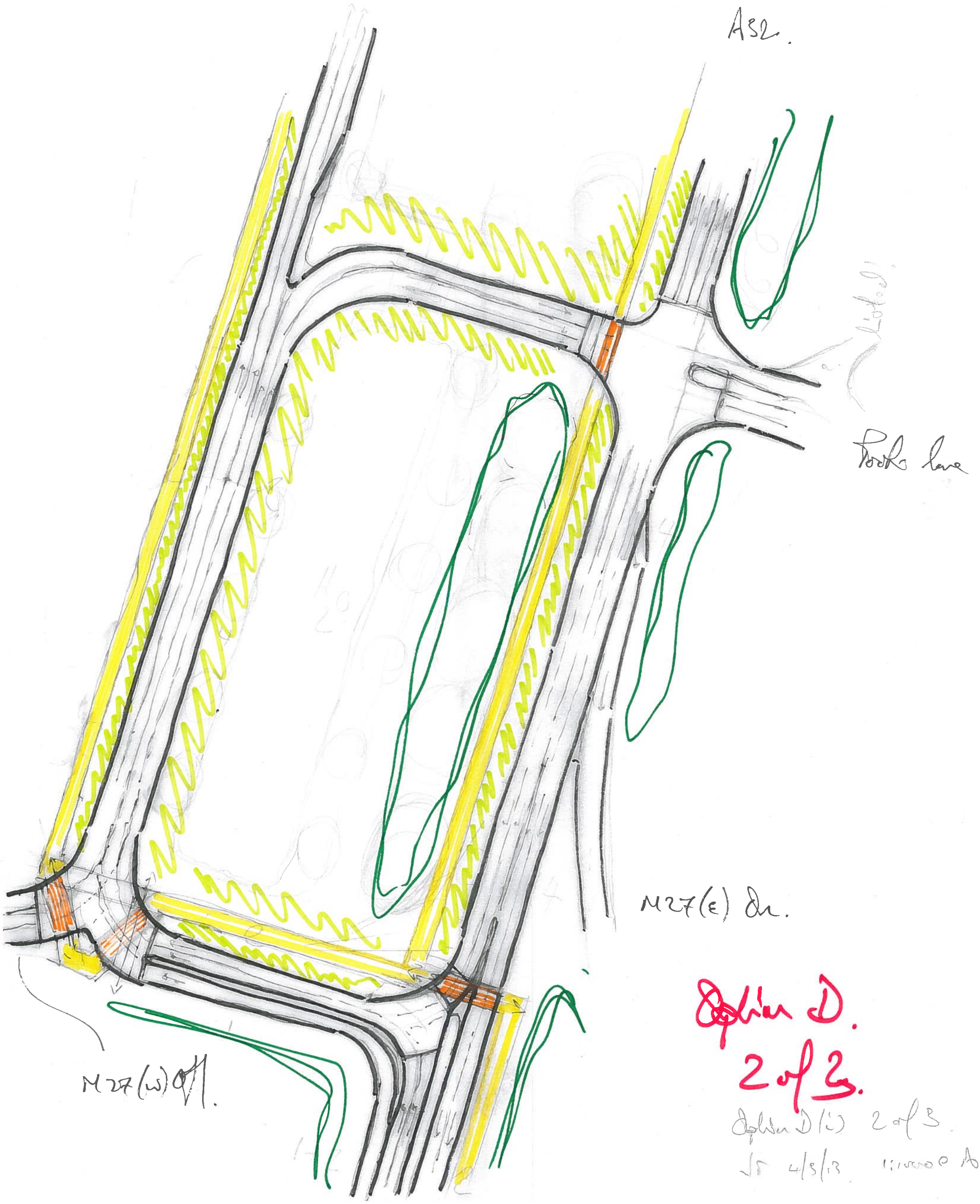
Appendix C – Run 5 Highway Arrangements



Option D.
1 of 3 v2.

Option D(ii)
Jr 8/5/02

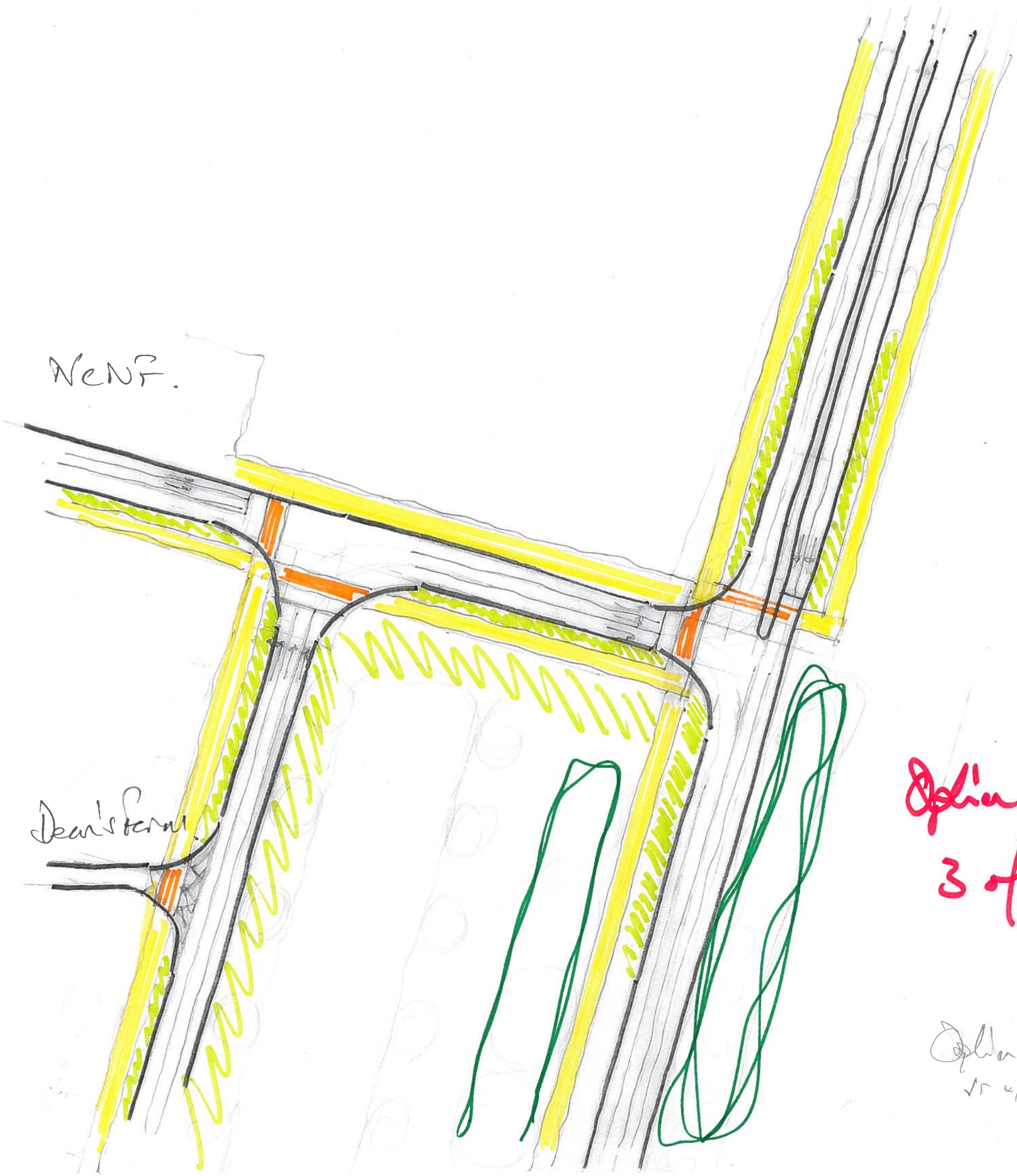
A52.



Option D.
2 of 3.

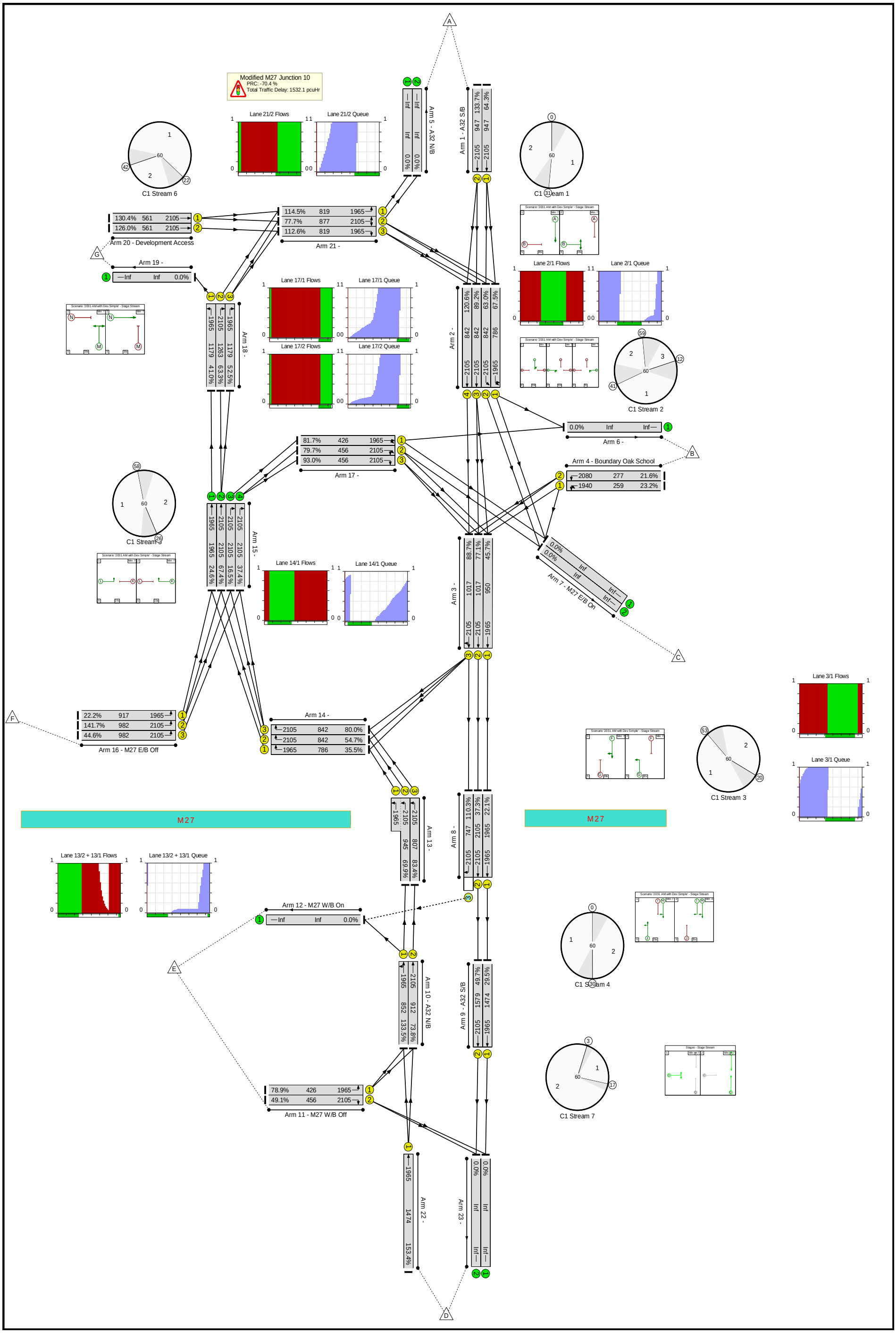
Option D(i) 2 of 3
JS 4/9/13 1:1000 @ A3

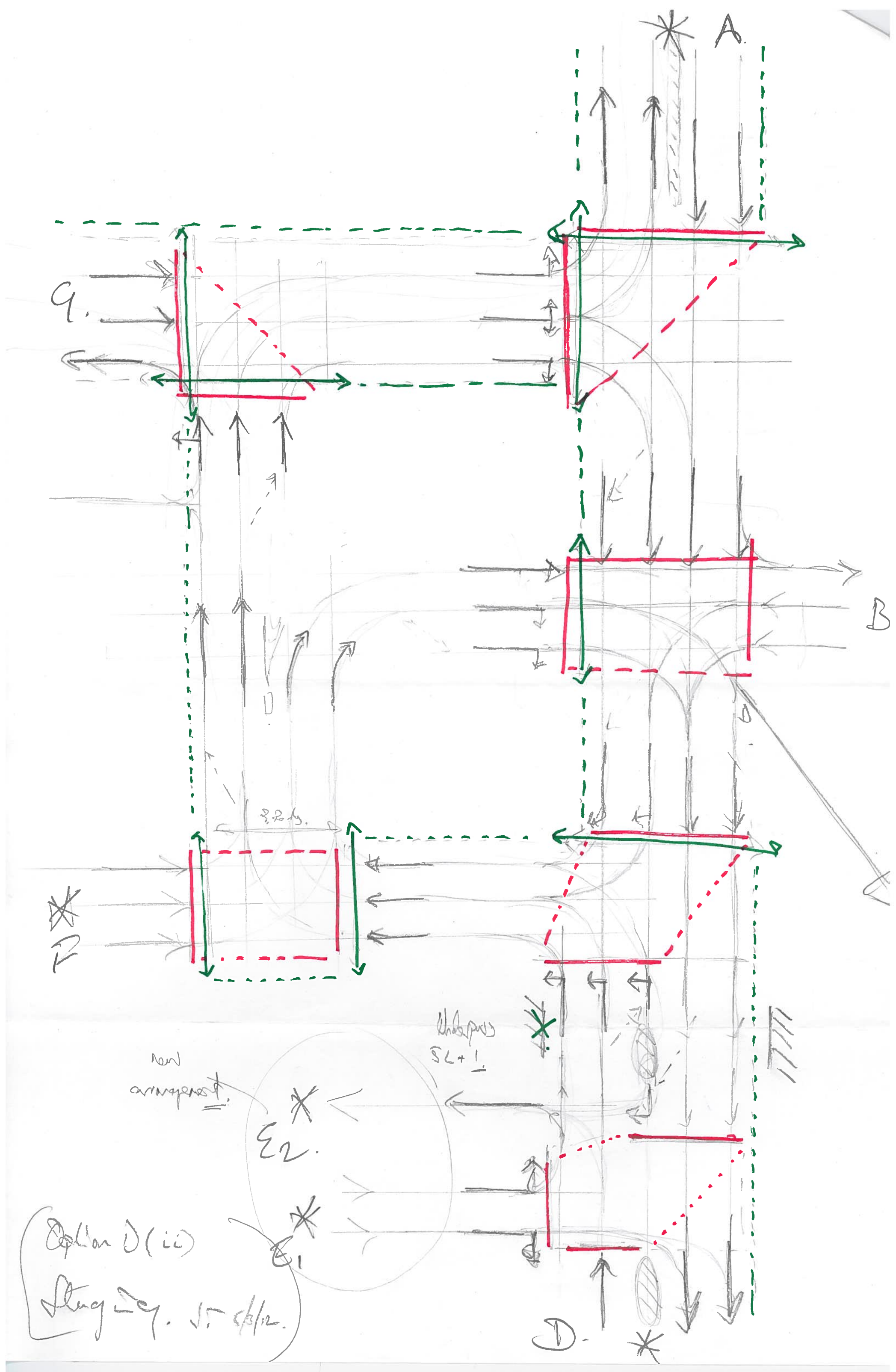
A32(1)

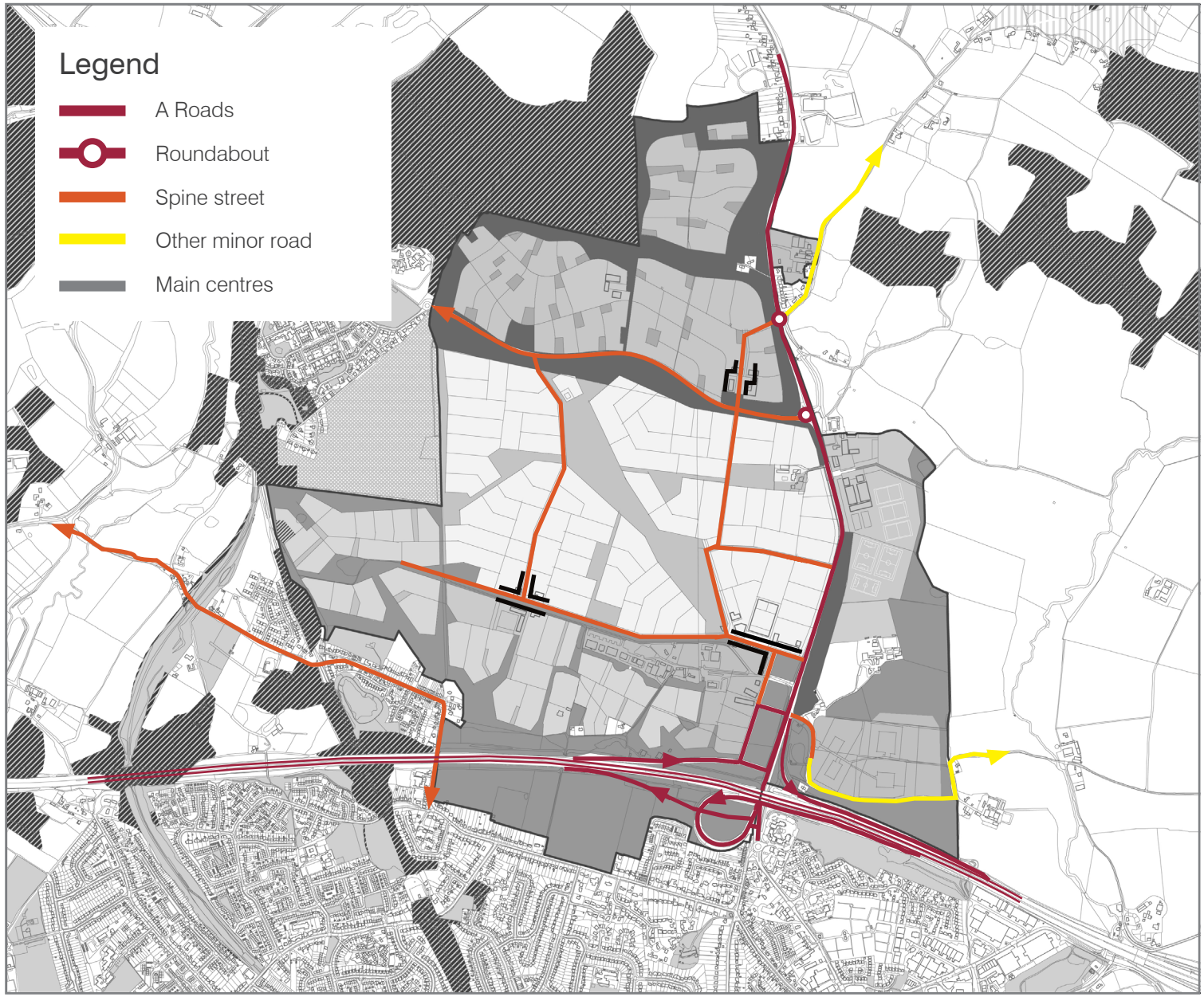


Option D.
3 of 3.

Option D(i) 1 of 3
JT 4/3/14 1:1000 A3


Modified M27 Junction 10
PRC: -70.4 %
Total Traffic Delay: 1532.1 pcuHr
Arm 5 - A32 N/B
Arm 1 - A32 S/B
C1 Stream 6
C1 Stream 1
Lane 21/2 Flows
Lane 21/2 Queue
Arm 20 - Development Access
Arm 21 -
Arm 19 -
Lane 17/1 Flows
Lane 17/1 Queue
Lane 17/2 Flows
Lane 17/2 Queue
Arm 18 -
Arm 2 -
Lane 2/1 Flows
Lane 2/1 Queue
C1 Stream 2
Arm 6 -
Arm 17 -
Arm 4 - Boundary Oak School
C1 Stream 5
Arm 15 -
Lane 14/1 Flows
Lane 14/1 Queue
Arm 3 -
Arm 7 - M27 E/B On
Arm 16 - M27 E/B Off
Arm 14 -
C1 Stream 3
Lane 3/1 Flows
Lane 3/1 Queue
M27
M27
Arm 13 -
Arm 8 -
Lane 13/2 + 13/1 Flows
Lane 13/2 + 13/1 Queue
Arm 12 - M27 W/B On
Arm 10 - A32 N/B
Arm 9 - A32 S/B
C1 Stream 4
C1 Stream 7
Arm 11 - M27 W/B Off
Arm 22 -
Arm 23 -


A
B
C
D
9.
R
$\mathcal{E}_2$
$\mathcal{E}_1$
Option D(ii)
Stung Eq. J.T. 6/3/12.



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