

Appendix C Part 1 - Horsham Highway Model Forecast Report

TECHNICAL NOTE

Job Name: Horsham Transport Study

Job No: 45539

Note No: TN04

Date: 24/01/2020

Prepared By: Robert Dziurla

Subject: Reference Case Forecast Modelling

1. Introduction

- 1.1. This note provides an overview of traffic congestion impacts of the Horsham Transport Model reference case forecast scenario. The output plots within this note are intended to identify any areas of forecast congestion that have the potential to be further exasperated by the emerging Horsham Local Plan development trip generation. It is the first stage of testing the impacts of the emerging Local Plan, and should not be seen as a stand-alone exercise, or used to inform other plans or projects.
- 1.2. A base year model has been developed with a base year of 2019 for AM (0800-0900) and PM (1700-1800) peak hours. This model is being used as the basis of which to derive 2036 future forecasts in order to evaluate the highway impact of developments within Horsham District up to the end of the Local Plan period.
- 1.3. The model is being developed within the traffic modelling software SATURN (Simulation and Assignment of Traffic to Urban Road Networks) . The model covers Horsham District and the immediate surrounding network and is a highway only model, being able to predict the routes that drivers choose and the associated congestion and delay impacts of highway travel demand, the travel demand feeding into SATURN is derived from a data collection study vehicle trip matrices of fixed origins and destinations.. A Local Model Validation Report has been produced setting out the base year model development and validation.

2. Reference Case Forecasting

- 2.1. The Reference Case Forecasting is set out by establishing predicted changes between the base year model and a future year scenario or conditions. In order to establish robust traffic forecasts the Reference case model has been developed in accordance to DfT Transport Analysis Guidance (TAG) forecasting guidance. The guidance helps limit and define uncertainty around assumptions and traffic growth forecasts that feed into the reference case. This includes guidance on the development of an uncertainty log which summarises all known assumptions that feed into the model and the level of certainty of each assumption. Also Dft TAG provides guidance on the application of background growth assumptions stemming from the National Trip End Model (NTEM).
- 2.2.

The Reference Case model will be used as the basis of comparison with emerging Local Plan scenarios and will inform the transport mitigation that would be required to deliver the Local Plan growth in transport terms. The Reference Case therefore includes all growth up to 2036 which results from development in neighbouring authorities and growth in Horsham District, excluding likely growth associated with emerging Local Plan. The Reference Case therefore presents a picture of highway conditions, prior to the addition of the emerging Local Plan developments. The growth included within the Reference Case model is described below.

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Information feeding into the reference case assumptions includes data (housing numbers, employment size) on developments and highway infrastructure schemes that are either committed through accepted planning permission or have a high probability that the outcome will happen as they are within adopted or emerging Local Plans and within Neighbourhood Plans. Emerging Local Plan development would be included where the Local Plan has reached Regulation 19 stage and is the plan that would be submitted to the Planning Inspectorate for examination.

- 2.3. As well as incorporating any committed development within the Horsham district into the reference case scenario, further committed developments within neighbouring authorities are also included. Developments within neighbouring authorities have been reviewed at a case by case basis and have only been included if assumed to have a perceptible impact to the Horsham highway network. Due to the scale of the strategic model having a limited amount of loading points onto the network for the spatially large zoning coverage, it was deemed that committed housing developments of a quantum less than 20 would not be included directly into the model due to the negligible increase in traffic growth at the specific zone locations. This leaves 200 additional dwellings that are not included as background growth within the district, equating to a background growth increase of less than 0.5% within the district. As such, using a proportionate approach, it has been deemed that the general background growth stemming from this would lead to negligible difference in traffic impacts within the model and that the minor background growth of these sites are not applied.

- 2.5. In addition, background growth assumptions have been applied to neighbouring authorities through growth rates; these growth rates are derived from national assumptions about background growth in travel demand, provided by the DfT through the National Trip End Model (NTEM) dataset. This dataset provides growth rates for any given year, based on housing growth, increases in job numbers and demographic changes at a District/Borough Level and is a recognised source of data for the purposes of producing forecast transport models of this nature.

- 2.6. Within Horsham, proposed Local Plan sites for the emerging Local Plan are not added to NTEM growth assumptions. The exemption of any NTEM background growth within Horsham is due to NTEM assumptions being superseded by the greater detailed understanding of the districts committed developments and the function of the Local Plan to deliver forecast housing and employment in comparison to assumptions from growth assumptions derived from NTEM.

- 2.7. Windfall sites can be considered to happen with or without an adopted development plan in place and as such would tend to be included within the reference case forecasting. However, for the purposes of assessing the combined impact of the windfall development alongside planned development allocations from emerging Local Plan and Neighbourhood Plans, windfall sites are to be applied within the “with-development” scenarios only and not the reference case. This is such that the transport strategy to mitigate these treats the impacts of all forms of development equally and is capable of accommodating the combined growth.

- 2.9. Adjusted NTEM Background growth rates are applied on top of committed developments in neighbouring authority areas. The adjusted NTEM background growth rates take into consideration projected NTEM growth rates for the forecast year of 2036 and subtract growth already applied through individual committed sites input within the model forecasts, so that the entire growth within neighbouring authorities matches with NTEM forecast figures.

A summary of the approach to infilling committed development and adjusting TEMPRO background growth forecasting is highlighted within tables 1- 3 below:

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Table 1: Reference Case Forecasting Assumptions

Zone Type	Committed Developments	NTEM Derived Background Growth
Horsham District Zones	✓	✗
Neighbouring Authority Zones	✓	✓

Table 2 – TEMPRO Dwellings Forecast Adjustment

Households						
Authority	TEMPO 2019	TEMPO 2036	Projected TEMPRO Growth	Committed Development Total (Dwellings)	Adjust/Not Adjust TEMPRO	Adjusted TEMPRO
Adur	29,269	31,736	2,467	-	No Adjustment	-
Arun	73,413	84,698	11,285	3,089	Adjust	81,609
Chichester	55,324	64,847	9,523	-	No Adjustment	-
Crawley	46,177	50,854	4,677	3,753	Adjust	47,101
Horsham	62,459	75,256	12,797	6,026	Not Applied	-
Mid Sussex	64,326	76,724	12,398	10,232	Adjust	66,492
Worthing	50,200	54,566	4,366	-	No Adjustment	-

Table 3 - TEMPRO Jobs Forecast Adjustment

Employment (Jobs)					
Authority	TEMPO 2019	TEMPO 2036	Projected Tempo Growth	Committed Employment (Jobs)	Adjust/Not Adjust/Don't Use Tempo
Adur	26,625	27,927	1,302	-	No Adjustment
Arun	59,368	62,339	2,971	-	No Adjustment
Chichester	73,832	77,507	3,675	-	No Adjustment
Crawley	95,326	99,983	4,657	-	No Adjustment

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Employment (Jobs)					
Authority	TEMPRO 2019	TEMPRO 2036	Projected Temprow Growth	Committed Employment (Jobs)	Adjust/Not Adjust/Don't Use Temprow
Horsham	67,348	70,633	3,285	10,392	Not Applied
Mid Sussex	72,794	76,393	3,599		No Adjustment
Worthing	59,459	62,431	2,972		No Adjustment

2.10. Another approach would be to use neighbouring authority Local Development Plans to underpin the total forecast growth from all neighbouring authorities. However, as Local Plan periods differ from authority to authority, and as there is a level of uncertainty regarding employment projections obtained from LDPs, there is an overall level of uncertainty in discerning whether neighbouring LDPs diverge or not from NTEM, therefore it has been assumed that adjusted NTEM figures, in combination with selected developments, provide a robust approach for background growth forecasting over assumptions from LDPs with varying plan periods.

2.11. The list of Committed Developments and those within the adopted Local Plan can be found within Appendix A.

3. Congestion Hotspots

3.1. Two indicators are used that highlight points of congestion within the forecast scenario models. This includes the measure of maximum junction turning Volume over Capacity Ratios (V/C) and link delay.

3.2. V/C is a standard measure of the performance of junctions and links and reflect how a junction performs based on the volume of traffic and the capacity.

3.3. When V/C ratios reach about 85%, rapid deterioration in network performance is experienced. A V/C ratio of 100% indicates a junction is at capacity. This results in increasing queues and delays.

3.4. Table 1 below indicates those junctions which are shown to have a V/C greater than 100% in the AM peak. The table also indicates whether the junctions are within or outside Horsham District. Table 2 shows the same information for the PM peak.

3.5. In addition, in the AM Peak period there were a total of 22 junctions with a volume capacity of between 85% and 100% within the Horsham District boundary. There were also approximately 31 junctions with the same capacity range outside of the district boundary.

3.6. In the PM Peak period, there were a total of 18 junctions with a volume capacity of between 85% and 100% within the Horsham District boundary. There were also approximately 19 junctions with the same capacity range on the strategic road network outside of the district boundary.

3.7. Link delay will include delays from junctions and also delays attributed to the link factors of a road, where the volume of traffic reaches the capacity, thus the general flow of traffic is slowed down causing delay. This type of delay is more typical on roads with merging traffic such as dual carriageways and motorways.

3.8. Plots within Appendix B highlight the key indicators of congestion hotspots within Horsham District, highway network within neighbouring authorities that are in close proximity to Horsham and also Highways England's Strategic Road Network (SRN) to the East of Horsham District are included in the assessment.

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Table 4: AM Peak Period Descriptions of Junctions over 100% Volume Capacity Ratio

Junction	Volume Capacity Ratio %	District
A2300 northbound slip to A23	132.22	Mid Sussex
A272 Wineham Lane Junction	125.94	Mid Sussex
A24 approach at Washington Roundabout	123.24	Horsham
B2118 merge onto A23 northbound	120.53	Mid Sussex
A23 at Pangdean Farm	110.84	Mid Sussex
A283 High Street/North Street Junction Storrington	109.13	Horsham
A24 Northbound signalised junction with A27	108.28	Horsham
Bolney Road/ Cowfold Road Roundabout	107.83	Mid Sussex
B2130/A281 junction at Elmbirdge Village	107.41	Waverley
A23 northbound slip road entry before M23 J11	106.89	Mid Sussex
M23 Junction 9 southbound onslip entry to mainline	104.3	Crawley
Five Oaks Roundabout	103.41	Horsham
A27 westbound signals at the A24/A27 junction	102.86	Horsham
Birghton Road entry at Longbridge Roundabout	101.91	Mole Valley
A272/A281 roundabout north of Cowfold	101.87	Horsham
A272 junction at turn to approach A23 slip road northbound at Bolney	101.61	Mid Sussex
M23 Junction 9 southbound onslip entry to mainline	101.47	Crawley
A264 Eastbound exit at Bewbush Manor Roundabout	101.38	Crawley
A264 Exit at M23 Junction 11 roundabout	101.2	Crawley
A264 entry at M23 Junction 11 roundabout	101.1	Crawley
Bewbush Manor Roundabout Sullivan Drive exit	100.85	Crawley
Brighton Road exit at Longbridge Roundabout	100.64	Mole Valley
M23 Northbound slip road merge at J10	100.48	Crawley
A27 signals over the A24/A27 junction	100.31	Horsham
A271 exit at Longbridge roundabout	100.02	Mole Valley
Bolney Road/ Cowfold Road Roundabout	100	Horsham
Slip road to A24 southbound from A27 (A24/A27 junction)	100	Mid Sussex

Table 5: PM Peak Period Description of Junctions over 100% Volume Capacity Ratio

Junction Description	Volume Capacity Ratio %	In District Boundary
A27 westbound signals at the A24/A27 junction	119.74	Horsham
A23 at Pangdean Farm	115.46	Mid Sussex
A24 Northbound signalised junction with A27	114.35	Horsham

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Junction Description	Volume Capacity Ratio %	In District Boundary
A23 northbound offslip at the roundabout at Hickstead	114.13	Mid Sussex
Bolney Road/ Cowfold Road Roundabout	112.11	Mid Sussex
M23 Junction 9 southbound onslip entry to mainline	110.9	Crawley
London Road approach at Washington Roundabout	108.44	Horsham
A283 approach at Washington Roundabout	107.24	Horsham
A24 eastbound approach to A24/A27 junction	106.05	Horsham
A264 Eastbound exit at Bewbush Manor Roundabout	105.6	Crawley
A283 High Street/North Street Junction Storrington	105	Horsham
A23/A273 junction at Pyecombe	104.86	Mid Sussex
B2130/A281 junction at Elmbirdge Village	104.69	Waverley
M23 Junction 9 southbound onslip entry to mainline	104.32	Crawley
A24 southbound signals before A24/A27 junction	103.97	Horsham
M23 southbound slip at M23 junction 11 roundabout	103.1	Crawley
A283 Amberley Road Roundabout Storrington	101.59	Horsham
Tower Road/ Foredt Road junction	101.11	Horsham
A2300/A23 Junction	101.08	Mid Sussex
Bar Lane/A24 junction	101.04	Horsham
A24 Southbound Exit at Flindon/A280 roundabout	101.01	Arun
A281/ Muddlesword Road junction	100.72	Mid Sussex
A283 /A29 South Roundabout Pulborough	100.66	Horsham
Bewbush Manor Roundabout Sullivan Drive exit	100.61	Crawley
M23 Northbound slip road merge at J10	100.43	Crawley
A272/A281 roundabout south of Cowfold	100.31	Horsham
Bolney Road/ Cowfold Road Roundabout	100	Mid Sussex
A272 junction at turn to approach A23 slip road northbound at Bolney	100	Mid Sussex
Slip road to A24 southbound from A27 (A24/A27 junction)	100	Horsham
Slip road to A24 southbound from A27 (A24/A27 junction)	119.74	Horsham

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed	Approved
45539/ Reference Case Forecast Congestion Hotspots /TN04	01	24.01.20	RD	PG	PG	PG

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Appendix C-1 LP Development Information

Scenario 1-1000 homes pa : c 9,304 new homes needed	Plan Period	Overall		Employment	Schools
West of Ifield (SA101)	2,500	10,000		750 B1a,b / 220 B1b/B8	1 x Secondary + 2xPrimary
East of Billingshurst (SA118)	650			410 B1a,b / 120 B1b/B8	1xPrimary
West of Kilnwood Vale Extension (SA341)	800			270 B1a,b / 80 B1b/B8	1xPrimary
Rookwood (SA394)	900			310 B1a,b / 90 B1b/B8	1xPrimary
West of Southwater (SA119)	800			410 B1a,b / 120 B1b/B8	1xSecondary + 1xPrimary
North Horsham densification (SA296)	250			6.4 ha	nil
Ashington	600				1xPrimary or expansion of existing
Barns Green	50				nil
Billingshurst	0			19,200 sqm	nil
Broadbridge Heath	150			3.7 ha	nil
Cowfold	75				nil
Henfield	350				nil
Horsham - Forest ward	100			3.7 ha	nil
Lower Beeding	35				nil
North Horsham parish	300				nil
Partridge Green	200			3.9 ha	nil
Pulborough	275			3 ha	nil
Rudgwick	50				nil
Small Dole	20				nil
Steyning	50				nil
Storrington & Sullington	100				nil
Thakeham	50				nil
Upper Beeding	70				nil
Warnham	50			3 ha	nil
West Chiltington	25				nil
North and south of Buck Barn Petrol Filling Station	0			5.5 ha	nil
Land South of Hop Oast Roundabout	0			1 ha	nil
TOTAL	8,450				

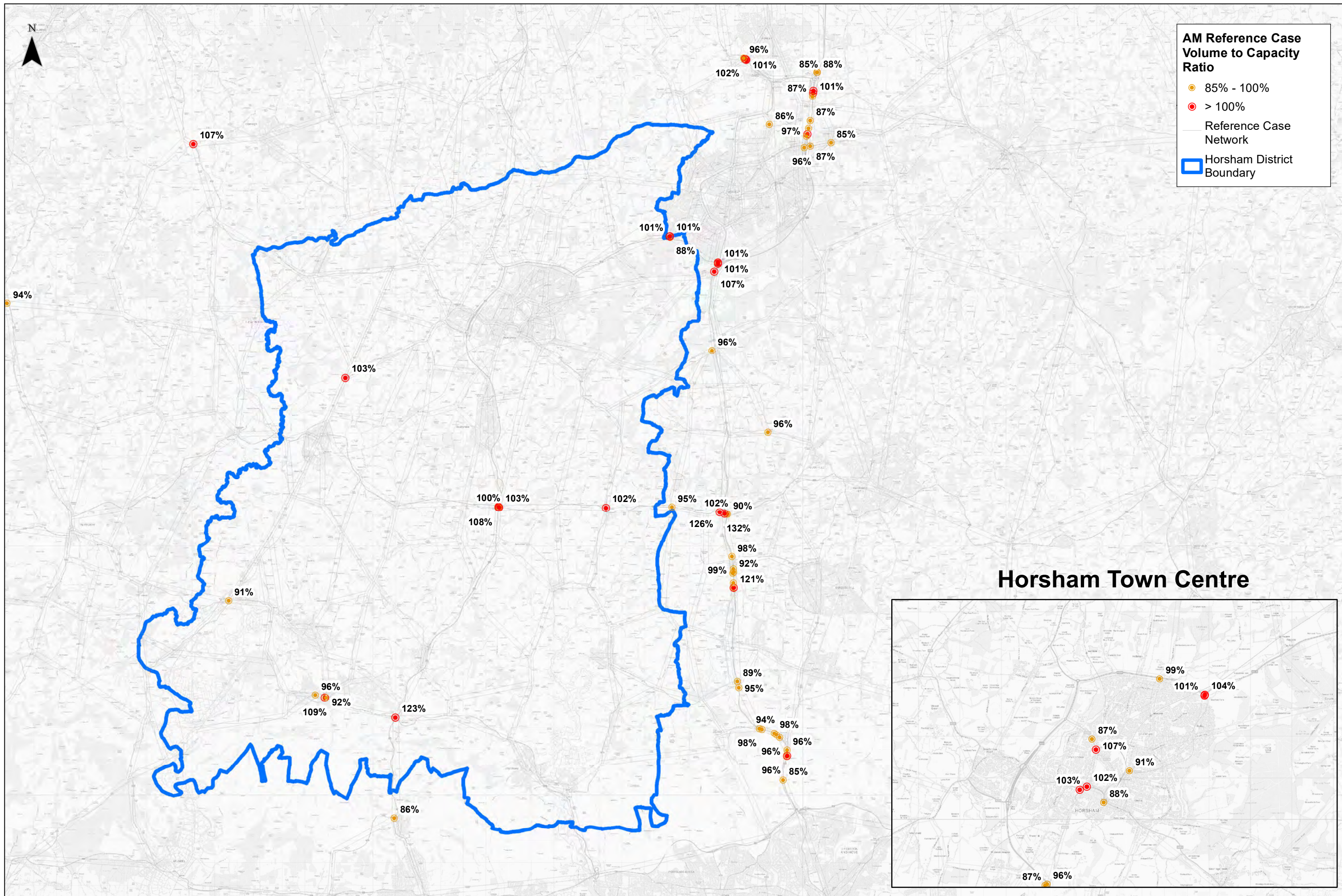
Scenario 2 : Medium Growth 1164 Homes p.a : New settlement plus settlement hierarchy (Mayfield): c 12,274 new homes needed	Plan Period	Overall		Employment	Schools
Mayfield (SA414)	1,900	7000		680 B1a,b / 200 B1b/B8	1xSecondary + 2xPrimary
West of Ifield (SA101)	2,500	10,000		750 B1a,b / 220 B1b/B8	1 x Secondary + 2xPrimary
West of Southwater (SA119)	800			410 B1a,b / 120 B1b/B8	1xSecondary + 1xPrimary
East of Billingshurst (SA118)	650			410 B1a,b / 120 B1b/B8	1xPrimary
Rookwood (SA394)	900			310 B1a,b / 90 B1b/B8	1xPrimary
West of Kilnwood Vale Extension (SA341)	800			270 B1a,b / 80 B1b/B8	1xPrimary
North Horsham densification	500			6.4 ha	nil
Ashington	600				1xPrimary or expansion of existing
Barns Green	50				nil
Billingshurst	0			19,200 sqm	nil
Broadbridge Heath	150			3.7 ha	nil
Cowfold	75				nil
Henfield	0				nil
Christs Hospital	30				nil
Horsham - Forest ward	100			3.7 ha	nil
Lower Beeding	35				nil
North Horsham parish	300				nil
Partridge Green	200			3.9 ha	nil
Pulborough	275			3 ha	nil
Rudgwick	50				nil
Small Dole	20				nil
Steyning	50				nil
Storrington & Sullington	100				nil
Thakeham	50				nil
Upper Beeding	70				nil
Warnham	50			3 ha	nil
West Chiltington	25				nil
North and south of Buck Barn Petrol Filling Station	0			5.5 ha	nil
Land South of Hop Oast Roundabout	0			1 ha	nil
TOTAL	10,280				

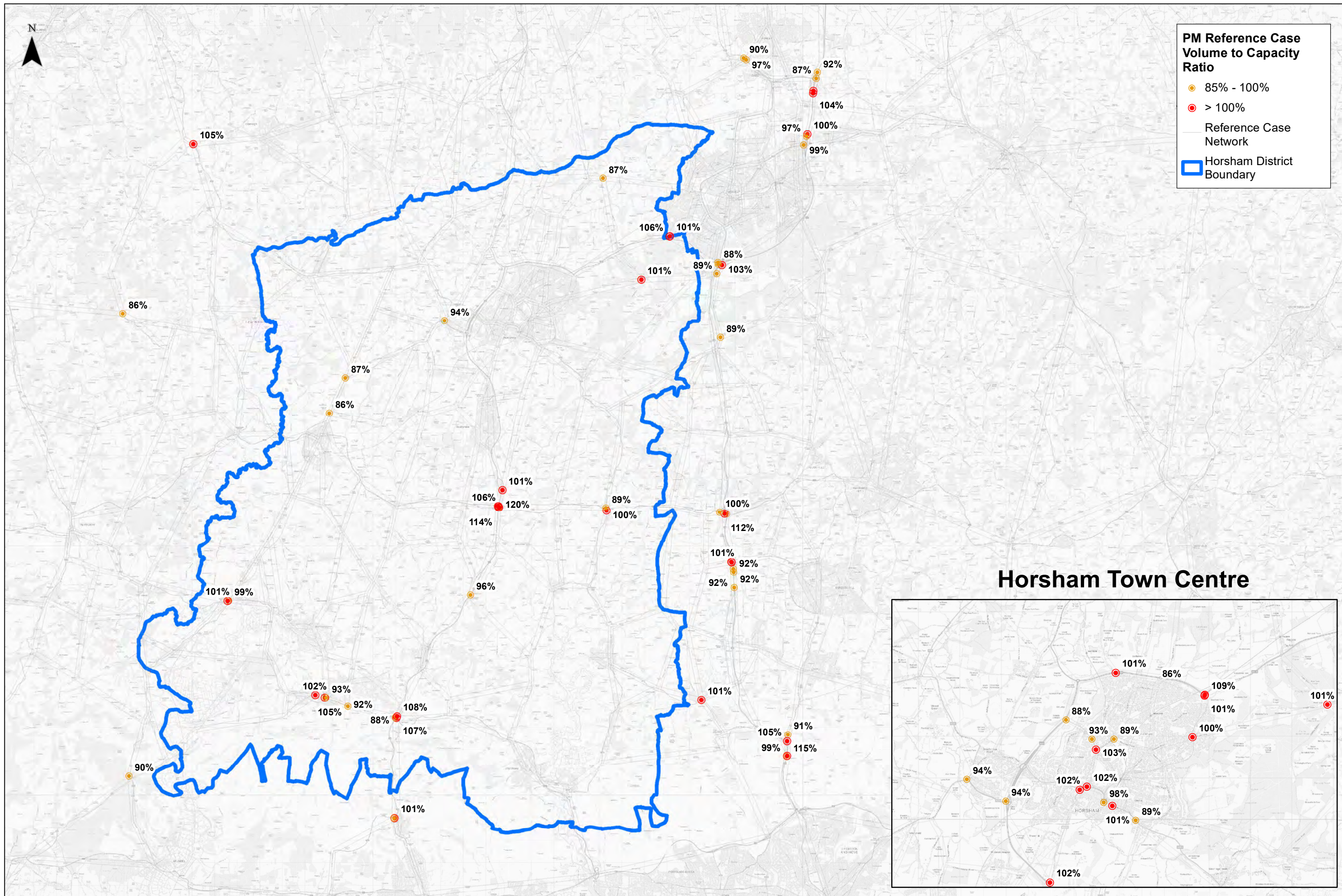
Scenario 3: Medium Growth 1164 Homes p.a : New settlement plus settlement hierarchy (Buck Barn) c12,274 new homes needed			Employment	Schools
Site	Plan Period	Overall		
Buckbarn (SA716)	2,100	3,500	680 B1a,b / 200 B1b/B8	2xPrimary
West of Ifield (SA101)	2,500	10,000	750 B1a,b / 220 B1b/B8	1 x Secondary + 2xPrimary
West of Southwater (SA119)	800		410 B1a,b / 120 B1b/B8	1 x Secondary + 1xPrimary
East of Billingshurst (SA118)	650		410 B1a,b / 120 B1b/B8	1xPrimary
Rookwood (SA394)	900		310 B1a,b / 90 B1b/B8	1xPrimary
West of Kilnwood Vale Extension (SA341)	800		270 B1a,b / 80 B1b/B8	1xPrimary
North Horsham densification (SA296)	500		6.4 ha	nil
Ashington	600			1xPrimary or expansion of existing
Barns Green	50			nil
Billingshurst	0		19,200 sqm	nil
Broadbridge Heath	150		3.7 ha	nil
Christ's Hospital	30			nil
Cowfold	0			nil
Henfield	350			nil
Horsham - Forest ward	100		3.7 ha	nil
Lower Beeding	35			nil
North Horsham parish	300			nil
Partridge Green	200		3.9 ha	nil
Pulborough	275		3 ha	nil
Rudgwick	50			nil
Small Dole	20			nil
Steyning	50			nil
Storrington & Sullington	100			nil
Thakeham	50			nil
Upper Beeding	70			nil
Warnham	50		3 ha	nil
West Chiltington	25			nil
North and south of Buck Barn Petrol Filling Station	0		5.5 ha	nil
Land South of Hop Oast Roundabout	0		1 ha	nil
TOTAL	10,755			

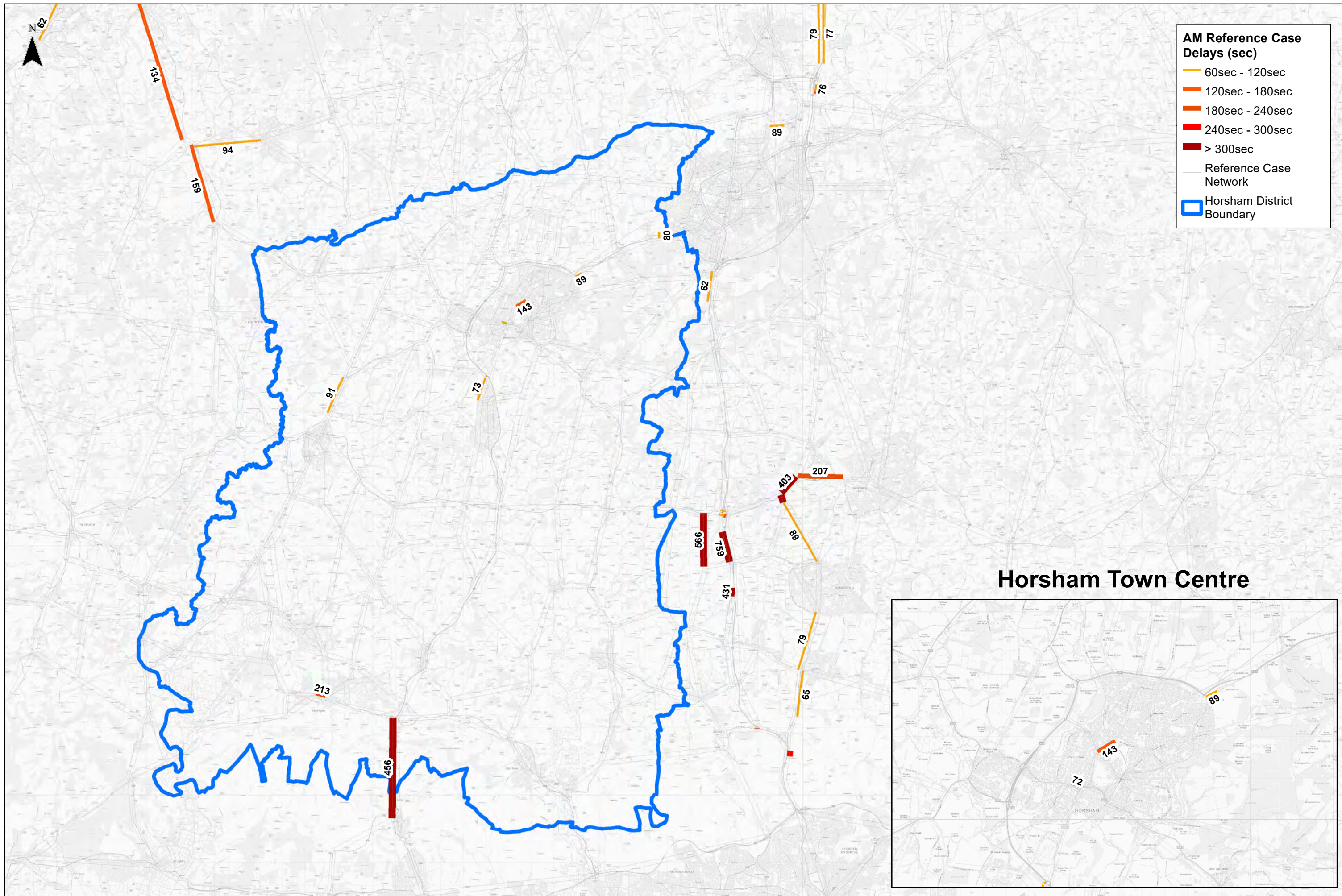
Scenario 4: Medium Growth 1164 Homes p.a : New settlement plus settlement hierarchy (Adversane) c12,274 new homes needed			Employment	Schools
Site	Plan Period	Overall		
Adversane	2,100	3,500	2.0 ha	1 x Secondary + 2xPrimary
West of Ifield (SA101)	2,500	10,000	750 B1a,b / 220 B1b/B8	1 x Secondary + 2xPrimary
West of Southwater (SA119)	800		410 B1a,b / 120 B1b/B8	1xPrimary
East of Billingshurst (SA118)	650		410 B1a,b / 120 B1b/B8	1xPrimary
Rookwood (SA394)	900		310 B1a,b / 90 B1b/B8	1xPrimary
West of Kilnwood Vale Extension (SA341)	800		270 B1a,b / 80 B1b/B8	1xPrimary
North Horsham densification (SA296)	500		6.4 ha	nil
Ashington	600			1xPrimary or expansion of existing
Barns Green	50			nil
Billingshurst	0		19,200 sqm	nil
Broadbridge Heath	150		3.7 ha	nil
Cowfold	75			nil
Christs Hospital	30			nil
Henfield	350			nil
Horsham - Forest ward	100		3.7 ha	nil
Lower Beeding	35			nil
North Horsham parish	300			nil
Partridge Green	200		3.9 ha	nil
Pulborough	275		3 ha	nil
Rudgwick	50			nil
Small Dole	20			nil
Steyning	50			nil
Storrington & Sullington	100			nil
Thakeham	50			nil
Upper Beeding	70			nil
Warnham	50		3 ha	nil
West Chiltington	25			nil
North and south of Buck Barn Petrol Filling Station	0		5.5 ha	nil
Land South of Hop Oast Roundabout	0		1 ha	nil
TOTAL	10,830			

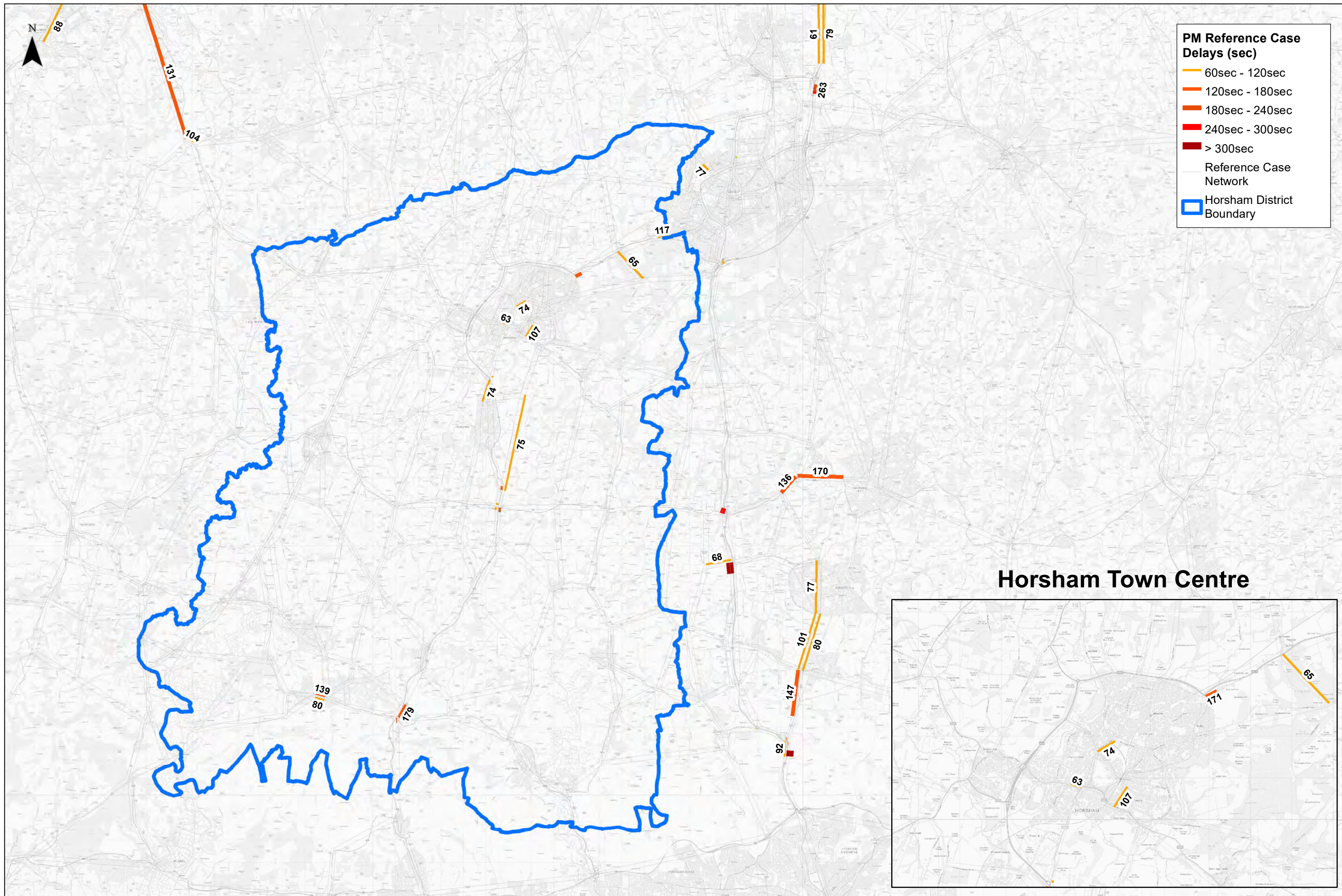
Scenario 5: High Growth: Urban Extension and New Settlements (c15,874 new homes needed)			Employment	Schools
Site	Plan Period	Overall		
Adversane	2,100	3,500	2.0 ha	1 x Secondary + 2xPrimary
Buckbarn (SA716)	2,100	3500	680 B1a,b / 200 B1b/B8	2xPrimary
Mayfield (SA414)	1,900	7,000	680 B1a,b / 200 B1b/B8	1xSecondary + 2xPrimary
West of Ifield (SA101)	2,500	10,000	750 B1a,b / 220 B1b/B8	1xSecondary + 2xPrimary
West of Southwater (SA119)	800		410 B1a,b / 120 B1b/B8	1xSecondary + 1xPrimary
East of Billingshurst (SA118)	650		410 B1a,b / 120 B1b/B8	1xPrimary
Rookwood (SA394)	900		310 B1a,b / 90 B1b/B8	1xPrimary
West of Kilnwood Vale Extension (SA341)	800		270 B1a,b / 80 B1b/B8	1xPrimary
North Horsham densification (SA296)	500		6.4 ha	nil
Ashington	600			1xPrimary or expansion of existing
Barns Green	50			nil
Billingshurst	0		19,200 sqm	nil
Broadbridge Heath	150		3.7 ha	nil
Christs Hospital	30			nil
Cowfold	0			nil
Henfield	0			nil
Horsham - Forest ward	100			nil
Lower Beeding	35			nil
North Horsham parish	300			nil
Partridge Green	200		3.9 ha	nil
Pulborough	275		3 ha	nil
Rudgwick	50			nil
Small Dole	20			nil
Steyning	50			nil
Storrington & Sullington	100			nil
Thakeham	50			nil
Upper Beeding	70			nil
Warnham	50		3 ha	nil
West Chiltington	25			nil
North and south of Buck Barn Petrol Filling Station	0		5.5 ha	nil
Land South of Hop Oast Roundabout	0		1 ha	nil
TOTAL	14,405			

Appendix C-2 Congestion Hotspots

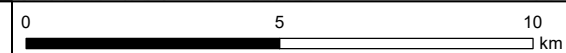








HORSHAM TRANSPORT STUDY
Reference Case



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Drawn: EP	Checked: RD
Figure 01	Rev A

Appendix C-3 Convergence & Gen Costs

VOT/PPM and VOC/PPK Values User Class and Time Period

User Class	AM		PM	
	PPM	PPK	PPM	PPK
Car Commute	1.00	0.42	1.00	0.31
Car Other	1.00	0.33	1.00	0.45
Car Business	1.00	0.17	1.00	0.26
LGV	1.00	0.51	1.00	0.53
HGV	1.00	1.32	1.00	1.06

2036 AM Convergence Statistics AM

AM			
Iteration	% Gap/ Delta	% Flow	%Cost Delays
39	0.0090	98.5	99.7
40	0.0082	98.8	99.7
41	0.0071	98.8	99.7
42	0.0087	98.9	99.7

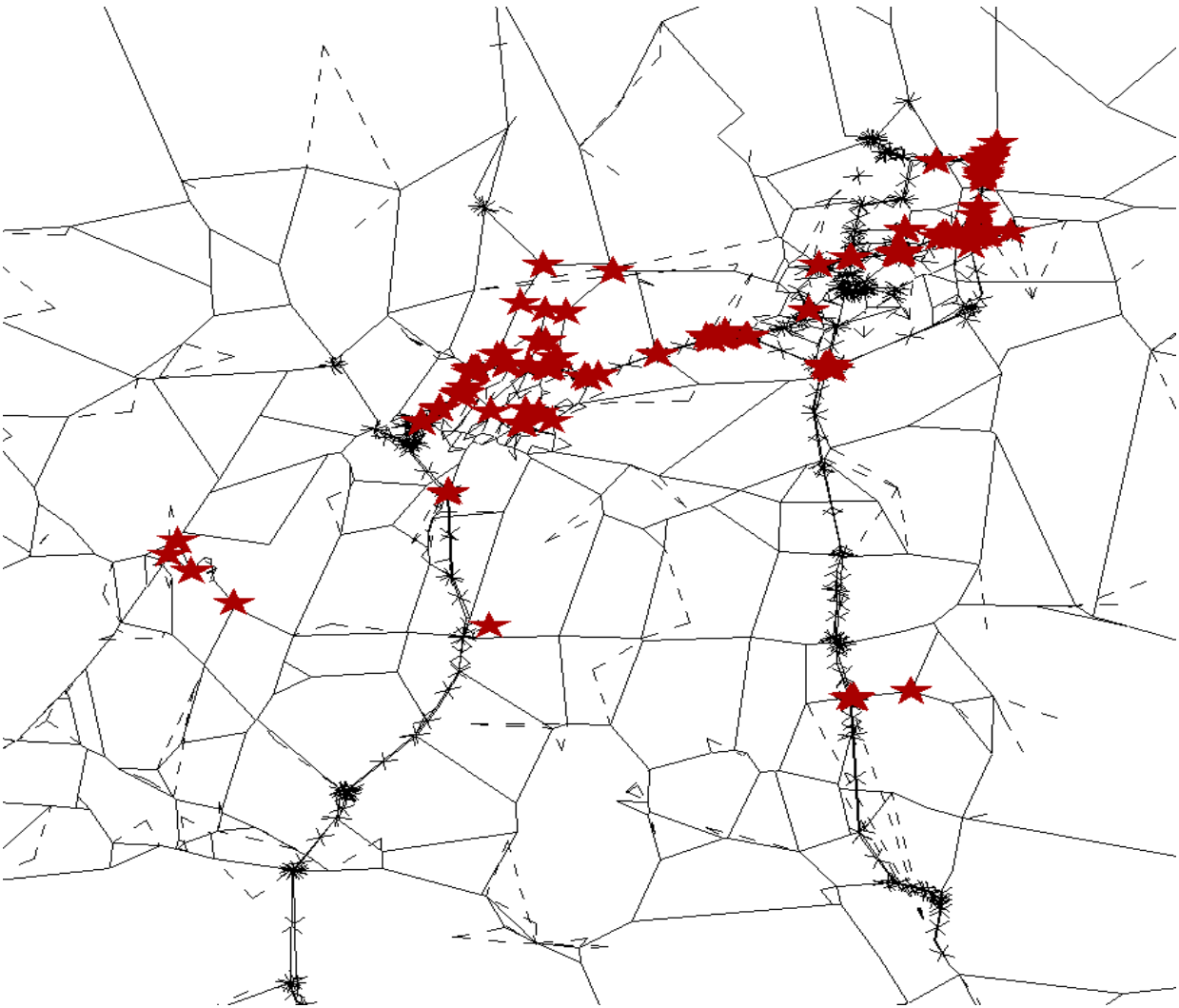
2036 PM Convergence Statistics PM

PM			
Iteration	% Gap/ Delta	% Flow	%Cost Delays
33	0.050	98.7	99.0
34	0.058	98.6	99.1
35	0.064	98.9	99.0
36	0.069	98.6	99.0

Appendix C-4 Committed Infrastructure Schemes

Reference Case Highway Schemes

A27 Arundel Bypass
Adversane - Brinsbury Field
M23 Smart Motorway
M23 J10
A2011 Crawley Avenue / A2004 Northgate Avenue / Hazelwick Avenue Proposed Improvements
Fleming Way Gatwick Rd Roundabout
A272 East Billingshurst - New Road
A24 Great Daux Roundabout
A24 Robin Hood Roundabout
A24 - Farthings Hill Interchange
Newbridge Roundabout
Horsham Enterprise Park Access
Cheals Roundabout
M23 J11 Improvements
Kilnwood Vale Main Access
A2300 / Cuckfield Lane Roundabout
North Horsham Development associated infrastructure
A24/B2237 Hop Oast Roundabout



Appendix C Part 2 - Horsham Highway Model Forecast Report Addendum

TECHNICAL NOTE

Job Name: Horsham Transport Study
Job No: 330610699
Note No: TN04A
Date: 06/12/2022
Prepared By: Robert Dziurla
Subject: Reference Case Forecast Modelling – 2039 Update Addendum

1. Introduction

1.1. This Addendum to the existing 2036 Reference case forecasting methodology note provides an overview of the 2039 reference case model and model convergence statistics.

2. Matrix Updates

2.1. The updated reference case takes into consideration 2039 forecasts, provided by the DfT through the National Trip End Model (NTEM) dataset and extracted using the DfT TEMPro.

2.2. The application of the NTEM background growth travel projections are set out with the same methodology as 2036, with adjusted NTEM Background growth rates applied on top of committed developments in neighbouring authority areas. Whilst in Horsham district NTEM growth assumptions are not used as they are superseded by the greater detailed understanding of the districts committed developments and the function of the Local Plan to deliver housing and employment.

2.3. The number of households assumed for each neighbouring authority for 2019 (base year) and 2039 Table 2-1. Where relevant, this also shows the number of committed developments and the adjusted NTEM numbers used within TEMPro to avoid double counting.

Table 2-1: NTEM Household Forecast Adjustment

Authority	NTEM 2019	NTEM 2039	Projected NTEM Growth	Committed Development Total (Dwellings)	Adjust/Not Adjust NTEM	Adjusted NTEM
Adur	29,269	32,044	2,775	-	No Adjustment	-
Arun	73,413	86,431	13,019	3,089	Adjust	83,342
Chichester	55,324	66,325	11,001		No Adjustment	-
Crawley	46,177	51,573	5,396	3,753	Adjust	47,820
Horsham	62,459	77,243	14,784	6,641	Not Applied	-
Mid Sussex	64,326	78,728	14,402	10,295	Adjust	68,433
Worthing	50,200	55,237	5,037	-	No Adjustment	-

TECHNICAL NOTE

2.4. The figures for employment are shown in Table 2-2.

Table 2-2: TEMPro Jobs Forecast Adjustment

Employment (Jobs)					
Authority	NTEM 2019	NTEM 2039	Projected NTEM Growth	Committed Employment (Jobs)	Adjust/Not Adjust/Don't Use NTEM
Adur	26,625	28,177	1,552	-	No Adjustment
Arun	59,368	62,901	3,533	-	No Adjustment
Chichester	73,832	78,205	4,373	-	No Adjustment
Crawley	95,326	100,882	5,556	-	No Adjustment
Horsham	67,348	71,267	3,919	6,641	Not Applied
Mid Sussex	72,794	77,081	4,287	-	No Adjustment
Worthing	59,459	62,992	3,533	-	No Adjustment

3. Network Updates

3.1. Committed highway schemes have also been updated with the latest information (scheme details listed within section 3.3 of the Horsham Local Plan TA Report). The A27 Arundel bypass is not included, as the scheme is outside the detailed model area.

3.2. The following junctions are additional commitments added to the pre-existing 2036 Reference Case model

- Access improvements at A2037 Henfield Road
- A283/B21351/Horsham Road, Steyning
- A23 Bolney Slip Rd / A272 Cowfold Road Improvements (Mid Sussex)

4. Generalised Cost Coefficients

4.1. Generalised Cost coefficients pertaining to the Value of Time for the user classes within the model have also been updated to 2039 forecasts, this is derived from DfT guidance in TAG data book V1.18 (May 2022). The revised values of time are shown in Table 4-1.

Table 4-1: VOT/PPM and VOC/PPK Values User Class and Time Period

User Class	AM		PM	
	PPM	PPK	PPM	PPK
Car Commute	1.00	0.16	1.00	0.16
Car Other	1.00	0.16	1.00	0.16
Car Business	1.00	0.23	1.00	0.22
LGV	1.00	0.32	1.00	0.32
HGV	1.00	1.09	1.00	1.09

TECHNICAL NOTE

5. Model Convergence

- 5.1. The convergence statistics have been taken from the 2039 reference case models and are shown in Tables 5-1 and 5-2 for the AM and PM peaks respectively. The level of convergence meets the DFT requirements.

Table 5-1: 2039 AM Convergence Statistics AM

Iteration	% Gap/ Delta	% Flow	%Cost Delays
42	0.0061	99.0	99.7
43	0.0069	98.8	99.7
44	0.0073	99.2	99.7
45	0.0049	98.6	99.7

Table 5-2: 2036 PM Convergence Statistics PM

Iteration	%Gap/ Delta	% Flow	%Cost Delays
37	0.0098	98.6	99.1
38	0.0089	98.9	99.1
39	0.0070	98.7	99.0
40	0.0077	98.9	99.2

DOCUMENT ISSUE RECORD

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