Braintree Local Plan - Options Assessment

Transport Planning

Document Control Sheet

Document prepared by:

Charles Freeman
Graduate Transport Planner

Transport Planning
Victoria House
Chelmsford
CM1 1JR

T 01245342618
E Charles.Freeman@essexhighways.org
W www.essex.gov.uk/highways

Report Title	Braintree Local Plan – Options Assessment
Project Number	B3553R0D 43TP005
Status	Final Draft
Revision	2
Control Date	26/01/16

Record of Issue

Issue	Status	Author	Date	Check	Date	Review	Date
1	Draft	C Freeman	11/01/16	T Kruger	12/1/16	J Jones	12/1/16
2	Final Draft	C Freeman	26/01/16	T Kruger	27/1/16	J Jones	1/2/16

Approved for Issue By	Date
T Kruger	2/2/16

Distribution

Organisation	Contact	Number of Copies
Essex County Council	Alan Lindsay	1
Essex County Council	Kevin Fraser	1

Contents

Tables

Figures

Executive Summary

Braintree District Council (BDC) asked Essex County Council (ECC) for traffic modelling support in relation to the development of their Local Plan proposals. The brief was specifically to explore and sift various development scenarios based on their estimated vehicle trip generation and impact on the road network as input to the development of a preferred development scenario.

BDC provided a list of sites totalling more than would be necessary to fulfil their requirements for up to 14,000 new homes and around 10,000 new jobs by 2033. From these, 11 development scenarios were created which, through an options workshop, were sifted down to 6 scenarios to be assesses in more detail. Prior to the sifting a sustainable transport assessment was undertaken for all the sites to identify those that would better support the provision of public transport services and cycling facilities.

To assess the impact on the road network, trip matrices were created for each scenario and then run in VISUM which assigned the development traffic onto the road network. The traffic flow results at each of the key junctions were extracted for each scenario from VISUM and added to the base flows at the key junctions also taking into account forecast background growth from neighbouring districts.

Junction models were created for each of the key junctions to assess the impact of each scenario, whilst the expected changes in flows at key points on the strategic network were also assessed.

It was found that three scenarios (3, 8 & 11) had a lower impact on the local junctions and one of these, Scenario 8 also had a relatively low impact on the strategic network.

1 Introduction

1.1 Background

1. Braintree District Council (BDC) asked Essex County Council (ECC) for traffic modelling support in relation to the development of their Local Plan proposals. Specifically, Essex Highways Transport Planning were requested to explore and sift various development scenarios based on their impact and demand on the transport system to enable the identification of a preferred development scenario for further investigation.

2. Following a Call for Sites, BDC identified a substantial list of potential sites that could be included in a preferred strategy. However, the total of these sites would contain more than would be necessary to fulfil their requirements for up to 14,000 new homes and around 10,000 new jobs by 2033.

3. Traffic modelling work has therefore been undertaken to provide an evidence base to assist BDC in the development of a preferred strategy. This report outlines all the steps undertaken to choose and assess six strategy options.

1.1.1 Objectives

4. The project objectives were as follows:

- To provide a framework by which BDC can assess the relative traffic impact of the potential development sites that might form the basis of their preferred Local Plan strategy.
- To inform an interactive 'Sifting Workshop' with BDC and ECC officers, in which the high level traffic impact of different combinations of possible development sites will be demonstrated.
- To assess the detailed traffic impact of up to 6 key 'strategy options' chosen by BDC and ECC following the Sifting Workshop. This will include local traffic operational modelling at around 10 specific junctions, as agreed with BDC and ECC, and will also incorporate the assessment of sites' potential to be served by public transport, walking and cycling to indicate a potential reduction in expected vehicle trip generation (sustainable transport assessment). The exact junctions and number of junctions will be identified from initial modelling work.
- To review the mitigation measures outlined in the Core Strategy developed by Mouchel in 2010 to verify that they are still appropriate.

- To report on the findings of the assessment work.

5. A separate Technical Note, entitled “Braintree Local Plan: Note on Sustainable Transport Accessibility Assessment”, has already been produced outlining in detail the methodology used and the results that were obtained.

6. This report completes this phase of the work.

1.1.2 Summary of Steps

7. The following steps have been completed to date, enabling BDC to choose a preferred strategy option, which will in due course require further detailed assessment to that presented in this report.

- Collected and reviewed traffic data
- Finalised development sites to be included in the work with BDC
- Carried out a sustainable transport accessibility assessment for the development sites
- Built and coded VISUM network
- Agreed assumptions for calculation of number of houses/jobs, where unknown, with BDC
- Calculated development trip generation and distribution
- Developed 11 strategy options
- Held an Options workshop and agreed six strategy options for further modelling
- Created local operational models for key junctions
- Ran operational models for base and future scenarios based on the six Strategy Options
- Reviewed mitigation measures outline in the 2010 Core Strategy
- Assessed the impact on the Strategic Network (A12, A120, M11)

1.2 Key Junctions

8. A number of key junctions in the district that were likely to require modelling were identified through consultation with BDC and ECC, and are as follows:

- A131 Head St / A1124 Hedingham Road / A1124 Colchester Road - Halstead
- B1024 Colne Road / A120 / Colne Road - Coggeshall
- Rye Mill Lane / B1024 / B1023 - Kelvedon
- B1018 Cressing Road / Rickstones Road / B1018 Braintree Road - Witham
- Chipping Hill / Avenue Road / The Avenue / Collingwood Road - Witham
- Collingwood Road / B1389 / Maldon Road - Witham

- B1389 / Gershwin Blvd / B1389 Hatfield Road – Witham
- B1137 The Street / B1019 Maldon Road / The Street – Hatfield Peverel
- A131 / London Road / B1053 London Road / A131 – Great Notley
- A131 / Cuckoo Way – Great Notley
- A131 / A120 / Pods Brook Road / A120 – Great Notley/Braintree
- Rayne Road / Springwood Drive / B1256 Rayne Road / Pods Brook Road - Braintree
- Rayne Road / Aetheric Road / Pierrefitte Way - Braintree
- B1053 Church Street / Bradford Street / B1053 Bradford Street - Braintree
- Panfield Road / Panfield Lane / Deanery Hill - Braintree
- A131 / Broad Road / A131 - Braintree
- B1256 Coggeshall Road / A131 / A120 / A131 - Braintree
- A120 / B1018 / Long Green / A120* - Braintree
- Millennium Way / B1018 / Braintree Road* - Braintree

9. The adequacy of the following A12 slip roads to accommodate additional development traffic has been considered in broad terms and can be found in Section 9:

- A12 / B1024 Off-slip (Kelvedon)
- A12 / London Road Off-slip (Kelvedon)
- A12 / B1389 Off-slip (Witham)

10. The locations of all the Key Junctions are shown in Figure 1 below.

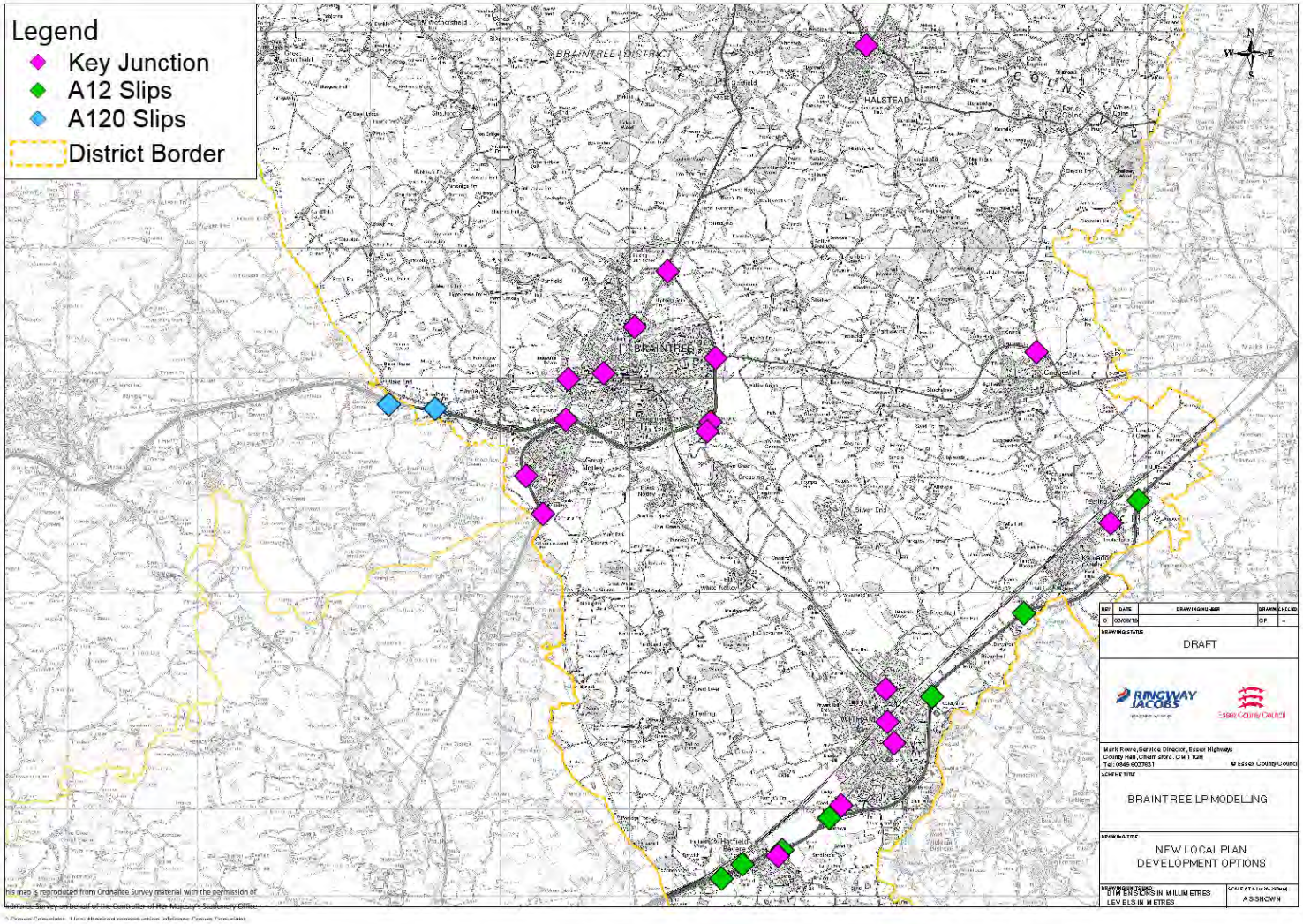


Figure 1: Key Junctions

11. At junctions where there was a lack of historic count data, new traffic counts were commissioned in June 2015 at the following locations:

13 hour weekday turning counts (6.00am to 7.00pm)

- B1053/Bradford St/Broad Rd – Braintree.
- Springwood Drive/Rayne Rd/B1256 Rayne Rd/B1256 Pod's Brook Rd - Braintree.
- A131/Cuckoo Way/ A131 (Notley Tesco Roundabout) – Braintree.
- B1389 Hatfield Rd/Gershwin Blvd/B1389 – Witham.
- B1018 Cressing Rd/Rickstones Rd/Braintree Rd – Witham.

Automatic Traffic Counts (ATCs) – 1 week, 24hrs a day, all in the same week as the corresponding junction counts

- Broad Rd – Immediately after mini roundabout before Bradford Street – Braintree.
- Rayne Rd – West of Junction count – Braintree.
- A131 – North of Junction count – Great Notley.
- B1389 Hatfield Rd – Northeast of Junction count before Maltings Ln – Witham.
- B1018 Cressing Rd – Northwest of Junction count before Cross Rd – Witham.
- B1019 Maldon Rd – Between junction with The Street and Glebefield Rd – Hatfield Peverel.
- The Street – Between Gleneagles Way and junction with B1137 – Hatfield Peverel.
- B1137 – Hatfield Peverel.
- B1053 Deanery Hill – Between junction with Panfield Ln and Churchill Rd - Braintree.
- Panfield Ln – Between junction with Deanery Hill and Churchill Terrace – Braintree.
- Dunmow Rd – Near to roundabout – Rayne.
- A120 On-slip – Between roundabout and A120 – Rayne.
- A120 Off-slip – Between A120 and roundabout - Rayne.
- B1256 – Between B1417 and Blake End Rd – Rayne.
- B1417 – Between roundabout and bend in the road – Rayne.

12. Further traffic counts were carried out for the B1024 Colne Road / A120 / Colne Road and Rayne Road / Aetheric Road / Pierrefitte Way junctions in September and November 2015 respectively.

2 Development Sites

2.1 Summary of Sites

13. BDC confirmed several sites to be included in all scenarios as "committed development" which are outlined in Table 1 below. These are sites that are not yet built, but building is likely to commence by 2017 and so are included towards the housing and job targets. The Strategy Options have then been developed using a combination of the remaining sites, shown in Table 2 below. The location of all the sites is shown in Figure 2. A further list of the sites with their respective housing and job numbers can be found in Appendix A.

Table 1: Committed Development Sites

Site Reference	Site Description	Type
GGHR 307	Land Off Oak Road, Halstead	Mixed
GNBN 264	Land Between London Rd/Pods Brook Road and the A120	Residential
PANF Core Strategy	Panfield Lane - Core Strategy Site	Mixed
RIVE 360	Forest Road	Mixed
WIS9E	Maltings Lane Business Park	Employment
WITC 423	Land at Lodge Farm, Witham	Mixed

Table 2: Optional Sites for Strategy Development

Site Reference	Site Description	Type
BCBG 149	Land around Braintree Tennis/Football Club, Clockhouse Way/Chapel Hill	Residential
BLAN 114	Land east of Great Notley/South of Braintree	Residential
BOCN 132	Land bounded by A131, Broad Road and River Blackwater, Braintree	Mixed
BOCN 137	Towerlands Park, between Panfield Lane and Deanery Hill	Mixed
BRAW 154	Land south west of Braintree (r/o Gilda Terrace)	Mixed
CRESS 189	Braintree Garden Centre, Cressing Road, Braintree	Mixed
CRESS 191	Land on the west side of Mill Lane, Cressing	Residential
CRESS 195	Ivy Cottage, Long Green, Braintree	Mixed

Site Reference	Site Description	Type
CRESS 199	Land Between Leyfield & Derrygowna, Braintree Road, Tye Green	Mixed
CRESS 200	Land at 'Leyfield' Braintree Road, Tye Green	Mixed
CRESS 202	Land South of Millennium Way, Braintree	Mixed
CRESS 203	Land South of Fowlers Farm Roundabout	Mixed
CRESS 204	Land South of A120, West of Railway, Braintree	Mixed
CRESS 205	Land South of A120 East of Railway, Braintree	Mixed
CRESS 206	Land North of Tye Green, Braintree	Mixed
CRESS 209	Land South Of Fowlers Farm, Braintree	Mixed
CRESS 212	Land East of Braintree (Temple Boarder)	Mixed
FEER 230	Land at Inworth Road, Feering	Residential
FEER 231	Land West of Marks Tey	Mixed
FEER 233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	Mixed
GGHR 282	Land adjoining the east side of Bluebridge Ind Est, Halstead	Employment
GGHR 284	Ravens Avenue	Residential
GNBN 265	Land North East of Queenborough Lane and south of Flitch Way, Braintree	Residential
GNBN 266	Land south west of Braintree (between Flitch Way and A120)	Mixed
GRNO 260 Option 1	Land west of A131 Great Notley	Employment
GRNO 260 Option 2	Land west of A131 Great Notley	Mixed
GRSA 269	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	Mixed
GRSA 270	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	Mixed
HASA 288	Land adjoining the west of Bluebridge Ind Est, Halstead	Employment
HASA 289	Land at Cherry Tree Close, Halstead	Residential
HASA 293	Land east of Sudbury Road (The Sleights) adj Churchill Ave, Halstead	Residential
HASA 295	Land off corner of Fenn Road and Brook Street, Halstead	Residential

Site Reference	Site Description	Type
HASA 513	Central Park, Halstead	Residential
HATF 315	Land at Woodend Farm, London Road, Witham	Residential
HATF 316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	Residential
HATF 317	Land off Gleneagles Way, Hatfield Peverel	Residential
HATF 321	Land Between Hatfield Peverel & Witham South of A12	Mixed
HATR 306	Land at Oak Road & Tidings Hill, Halstead	Mixed
KELV 337	Land at London Road, between Crabb's Lane and Church Street, Kelvedon	Mixed
KELV 338	Land south of London Road, r/o nos 61-95, Kelvedon	Country park
LIST 339	Former IFF site Liston, near Long Melford	Residential
PANF 136	Land at Panfield, northwest of Springwood Industrial Estate	Employment
RIVE 361	Land at The Old Rectory, Rivenhall	Residential
RIVE 366a	Forest Road, North East Witham, Phase 2a	Residential
RIVE 366b	Forest Road, North East Witham, Phase 2b	Residential
SILV 388	Crittal Factory and adjacent site, Silver End	Residential
SILV 389	North of Western Road. Silver End	Residential
WITN 426	Land to north west of Conrad Road, Witham	Residential
WITN 427	Land North of Conrad Road (redundant allotments), Witham	Residential
WITN 428	Land adjacent Conrad Road/Elm Hall Cottages, Witham	Mixed

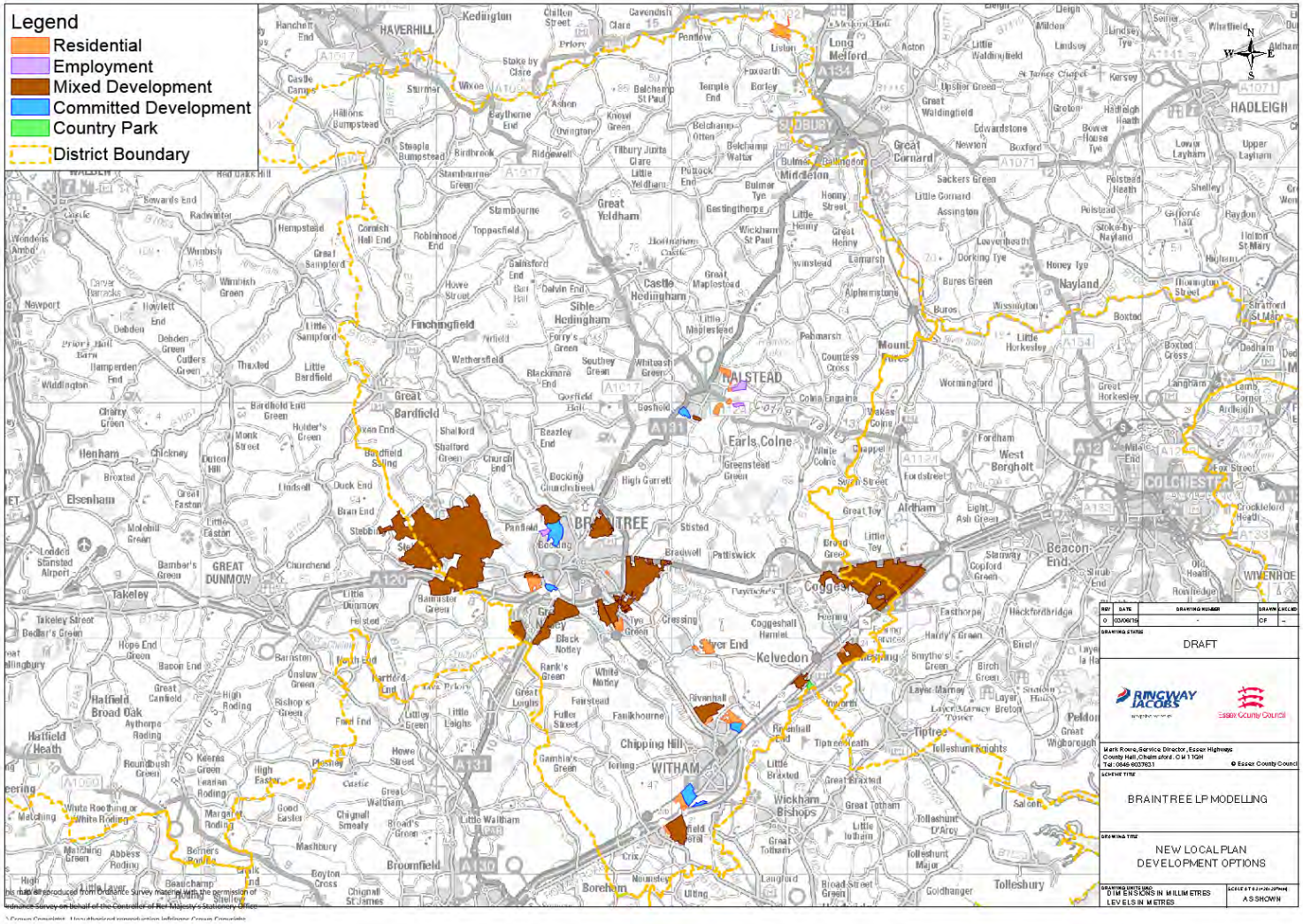


Figure 2: Location of all sites considered in Strategy Development

2.2 Site Housing and Job Numbers

2.2.1 Site Assumptions

14. Various assumptions had to be made for different aspects of the development sites to obtain consistent levels of detail. These are shown in the tables below. Some site specific assumptions were also made, such as the 3,100 homes assumed for site FEER 231 in order to ensure consistency with the Colchester Local Plan modelling work. It has been assumed that the other large site, GRSA 269/270, will also accommodate 3,100 homes by 2033.

15. Where the site use was not defined, it was assumed to be mixed and Table 3 outlines the assumptions made for mixed use sites. The assumptions were based on research, primarily from the TRICS (Trip Rate Information Computer System) database, of previous mixed use sites in similar areas to Essex in England.

Table 3: Mixed use or Unknown use Site Assumptions

Housing	Employment
80%	20%

16. Table 4 shows the assumptions made for sites where the number of houses was unknown. A study was undertaken to assess the number of houses per hectare, ranging from Garden Village to Urban developments. It was found that a site density of 24.4 houses/ha would best suit the development options in Braintree, as most are situated on the edge of existing urban areas.

Table 4: Assumptions used for sites with an unknown number of houses

Open Space	Infrastructure	Housing	Houses/ha
22%	20%	58%	24.4

17. The majority of the job numbers, types of employment and percentage splits for each type of employment were unknown and so Table 5 and Table 6 show the assumptions used to calculate the job numbers for each site. It was assumed that only 30% of the total employment site would be GFA (Gross Floor Area). The assumptions were based on a comparison of 10 similar sites, from the TRICS database, for each type of employment to provide an average number of employees per hectare. In some instances the type of employment was known but not the percentage split and so where not known, assumptions have been

made as shown in Table 6. These assumptions were based on similar existing sites within Essex.

Table 5: Employees per hectare by type of employment

Type	GFA(m^2)/Employee	GFA(ha)/Employee	Employees/ha
A1	19.84	0.0019	504.03
B1	19.38	0.0019	516.00
B2	105.49	0.0105	94.80
B8	155.81	0.0155	64.18

18. It has been assumed that sites where the employment type(s) has not been specified will be a mix of B1, B2, and B8 employment. This was based on the general make up of employment sites within Essex.

Table 6: Employment type percentage split

B1	B2	B8
20.00%	80.00%	-
20.00%	40.00%	40.00%

2.2.2 Housing and job numbers

19. Table 7 below shows the housing and job numbers used for each site to help generate each of the strategy options. These were agreed with BDC prior to the development of the strategies. Sites where the housing and/or job number has been estimated as outlined above have been highlighted in light green. The committed development sites have been highlighted in light blue. The table shows the expected level of development by 2033 as some sites, such as GRSA 269/270 are likely to be considerably larger in the long term.

Table 7: Housing and Job numbers for each development site

Site Reference	Number of houses	Number of jobs
BCBG 149	88	0
BLAN 114	2000	1074
BOCN 132	1000	118
BOCN 137	1,150	250
BRAW 154	1,500	1889
CRESS 189	31	16
CRESS 191	360	0

Site Reference	Number of houses	Number of jobs
CRESS 195	10	3
CRESS 199	12	4
CRESS 200	4	3
CRESS 202	2000	1980
CRESS 203	Included in CRESS 202 assumptions	Included in CRESS 202 assumptions
CRESS 204	Included in CRESS 202 assumptions	Included in CRESS 202 assumptions
CRESS 205	Included in CRESS 202 assumptions	Included in CRESS 202 assumptions
CRESS 206	Included in CRESS 202 assumptions	Included in CRESS 202 assumptions
CRESS 209	Included in CRESS 202 assumptions	Included in CRESS 202 assumptions
CRESS 212	2000	1000
FEER 230	40	0
FEER 231	3100	1727
FEER 233	950	200
GGHR 282	0	137
GGHR 284	275	
GGHR 307	300	138
GNBN 264	220	0
GNBN 265	420	0
GNBN 266	Included in BRAW 114 assumptions	Included in BRAW 114 assumptions
GRNO 260 Option 1		2250
GRNO 260 Option 2	497	866
GRSA 269	3100	1700
GRSA 270	Included in GRSA 269 assumptions	Included in GRSA 269 assumptions
HASA 288	0	459
HASA 289	28	0
HASA 293	250	0
HASA 295	44	0
HASA 513	104	0
HATF 315	390	0
HATF 316	49	0
HATF 317	135	0
HATF 321	475	681
HATR 306	90	42

Site Reference	Number of houses	Number of jobs
KELV 337	269	441
KELV 338	0	0
LIST 339	100	0
PANF 136	Not specified	225
RIVE 360	370	45
RIVE 361	85	0
RIVE 366a	350	0
RIVE 366b	Included in RIVE 366a assumptions	Included in RIVE 366a assumptions
SILV 388	100	0
SILV 389	350	0
WITC 423	750	200
WITN 426	150	0
WITN 427	7	0
WITN 428	1500	250
WIS9E		588
PANF Core Strategy	600	751

3 Sustainable Transport Accessibility Assessment

20. 43 sites were considered for assessment and were ranked by their existing, potential and combined (existing and potential) levels of sustainable transport accessibility. A further three employment sites and a country park were not considered in this assessment. The employment sites are extensions of existing industrial sites while the country park is not considered to have significant weekday peak hour transport demand or impact. A further six sites, considered to be committed development, were also excluded from this part of the study.

21. A separate Technical Note, entitled "Braintree Local Plan: Note on Sustainable Transport Accessibility Assessment", was produced outlining in detail the methodology used and the results that were obtained. This section summarises the salient points.

3.1 Methodology

22. The methodology used to weight and rank the Braintree Local Plan (LP) sites was adopted from guidance by the Department for Transport, in particular the WebTAG Appraisal Summary Table (AST)[1]. The sub-objectives of the AST were used to develop measurements which were weighted based on perceived importance, shown in Table 8 below.

Table 8: Weights for each Sustainable Accessibility Measurement

Sustainable Accessibility Measurements	Ref No.	Weighting out of 100
Economy		
Typical commuter journey time	**1**	10
Commuter journey time reliability	**2**	20
Environment		
Noise and air quality linked to vehicle flow and congestion	**3**	10
Social (health, education etc.)		
Typical non-commuter journey time	**4**	15
Non-commuter journey time reliability	**5**	15
Physical activity related to walking/cycling	**6**	5
Access to local services	**7**	25

[1] https://www.gov.uk/government/publications/webtag-appraisal-tables

23. Indicators to appraise each site were drawn up and were linked to one or more of the sustainability measurements shown in Table 8. A weighted factor was then calculated for each of these indicators from the sum of the sustainability measurements applicable to that indicator and is shown in Table 9.

Table 9: Indicators and weighting factors

	Indicators	Indicator Score	Weighting Factor
	Walking distance to nearest bus stop (with at least peak hourly day service)	50	1.10
Rail access	Distance to nearest rail/tube station	60	1.32
	Bus service frequency to rail/tube station (av. per hr of AM & PM peaks)	35	0.77
	Typical bus journey time to nearest rail/tube station	25	0.55
Town access	Distance to nearest town centre	85	1.87
	Bus service frequency to town centre (av. per hr of AM & PM peaks)	60	1.32
	Typical bus journey time to town centre	25	0.55
Health access	Distance to nearest GP surgery	55	1.21
	Bus service frequency to nearest GP surgery (av. per hr of AM & PM peaks)	40	0.88
	Typical bus journey time to nearest GP surgery	15	0.33
Education access	Distance to nearest nursery/pre-school	55	1.21
	Distance to nearest infant/primary school	55	1.21
	Distance to nearest secondary school	55	1.21
	Bus service frequency to nearest secondary school	40	0.88
	Proximity of bus route to nearest secondary school	40	0.88
Ped / Cycle access	Current level of cycle access to/from SLAA site	40	0.88
	Current level of pedestrian facilities in vicinity of SLAA site	40	0.88
Traffic Impact	Proximity of SLAA site access to an identified key congested junction	45	0.99
	Scale of peak hour congestion expected in vicinity of site	45	0.99
	Existing local residents' propensity to drive to work based on 2011 Census	46	1.00
Potential	Distance to nearest bus route if no nearby bus stop (assuming potential for new stop to be added)	50	1.67
	Potential to direct bus services to serve SLAA development (based on proximity of nearest bus route and quantum of devt)	85	2.83
	Improved frequency of public transport serviced to/from site (based on quantum of development proposed)	85	2.83
	Potential for encouraging cycle use to/from SLAA site (based on proximity of local services)	40	1.33
	Potential for encouraging walking to/from SLAA site (based on proximity of local services)	40	1.33

24. Indicators for 'potential' of sites were included in the assessment to ensure that LP sites with no pre-existing sustainable travel facilities were not necessarily penalised on sustainable accessibility if there is a possibility that such developments, once built, would facilitate the provision and/or encourage the uptake of sustainable travel modes.

25. Weighting factors were calculated separately for the five site 'potential' indicators. Through iterative testing of the weighting system, it was found that a doubling of the weights applied to these indicators offered the best means of adjusting scores in the evaluation of existing sustainable accessibility.

26. Each LP site was then scored under the 25 sustainable accessibility indicators listed in Table 10 below. The basic scoring system assigns 0, 10, or 20 points under each indicator based on the criteria outlined in Table 10 below.

Table 10: Basic scoring systems adopted for LP site sustainable accessibility appraisal

	Indicators	Score System
	Walking distance to nearest bus stop (with at least peak hourly day service)	>1km = 0 points, 400-1000m = 10 points, <400m = 20 points
Rail access	Distance to nearest rail/tube station	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Bus service frequency to rail/tube station (av. per hr of AM & PM peaks)	0 = 0 points, 1-2 = 10 points, 3+ = 20 points
	Typical bus journey time to nearest tail/tube station	>30 mins = 0 points, 15-30 mins = 10 points, <15 mins = 20 points
Town access	Distance to nearest town centre	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Bus service frequency to town centre (av. per hr of AM & PM peaks)	0 = 0 points, 1-2 = 10 points, 3+ = 20 points
	Typical bus journey time to town centre	>30 mins = 0 points, 15-30 mins = 10 points, <15 mins = 20 points
Health access	Distance to nearest GP surgery	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Bus service frequency to nearest GP surgery (av. per hr of AM & PM peaks)	0 = 0 points, 1-2 = 10 points, 3+ = 20 points
	Typical bus journey time to nearest GP surgery	>30 mins = 0 points, 15-30 mins = 10 points, <15 mins = 20 points
Education access	Distance to nearest nursery/pre-school	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Distance to nearest infant/primary school	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Distance to nearest secondary school	>4km = 0 points, 1-4km = 10 points, <1km = 20 points
	Bus service frequency to nearest secondary school	0 = 0 points, 1-2 = 10 points, 3+ = 20 points
	Proximity of bus route to nearest secondary school	>1km = 0 points, 400-1000m = 10 points, <400m = 20 points
Ped / Cycle access	Current level of cycle access to/from SLAA site	none = 0 points, limited = 10 points, good = 20 points
	Current level of pedestrian facilities in vicinity of SLAA site	none = 0 points, limited = 10 points, good = 20 points
Traffic Impact	Proximity of SLAA site access to an identified key congested junction	<500m = 0 points, 500-1000m = 10 points, >1km = 20 points
	Scale of peak hour congestion expected in vicinity of site	moderate congestion = 0 points, low level congestion = 10 points, uncongested = 20 points
	Existing local residents' propensity to drive to work based on 2011 Census	>40% drive to work = 0 points, 30-40% = 10 points, <30% = 20 points
Potential	Distance to nearest bus route if no nearby bus stop (assuming potential for new stop to be added)	>1km = 0 points, 400-1000m = 10 points, <400m = 20 points
	Potential to direct bus services to serve SLAA development (based on proximity of nearest bus route and quantum of devt)	low = 0 points, medium = 10 points, high = 20 points
	Improved frequency of public transport serviced to/from site (based on quantum of development proposed)	low = 0 points, medium = 10 points, high = 20 points
	Potential for encouraging cycle use to/from SLAA site (based on proximity of local services)	car dependent = 0 points, limited = 10 points, good = 20 points
	Potential for encouraging walking to/from SLAA site (based on proximity of local services)	car dependent = 0 points, limited = 10 points, good = 20 points

3.2 Summary of Results

27. Ranked tables of the 43 potential Local Plan sites have been produced and can be found in Appendix B. Site rankings have been based on:

- The existing levels of sustainable accessibility;
- The potential for improving sustainable accessibility; and
- The combined existing and potential levels of sustainable accessibility at the LP site locations.

3.2.1 Existing Levels of Sustainable Accessibility

28. A summary for the existing levels of Sustainable Accessibility is shown below in Figure 3.

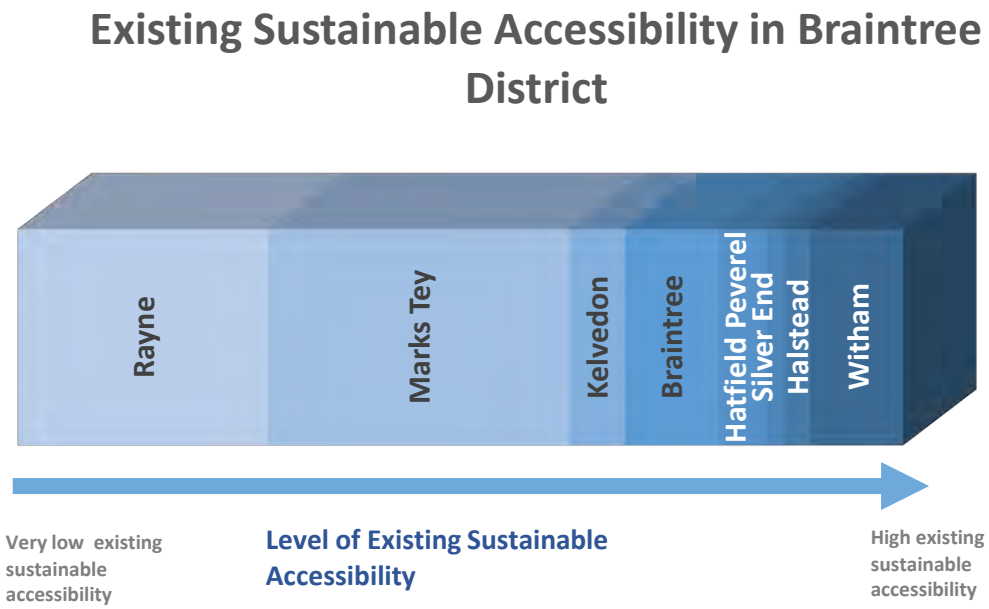


Figure 3: Average level of existing sustainable accessibility achieved by sites in towns and villages in Braintree District

29. Sites within Witham have scored highly on existing sustainable accessibility due to:

- The close proximity to the local nursery, primary and secondary schools, with the majority being within walking distance.
- The proximity to the town centre and GP surgeries.
- The frequent and direct bus services that connect the residential areas of Witham to the town centre and the railway station.
- The existing propensity for local residents to travel to work via modes other than car or van.

30. Rural areas such as Rayne have scored low on existing sustainable accessibility, due to:

- The distance to the nearest town centre, railway station and schools.
- The distance to the nearest bus stop providing an hourly or better bus service to the local services. With both cases the bus stop exceeds the acceptable walking distance of 1km, meaning residents will be less inclined to use the bus service.
- The current levels of travel to work by car, which would suggest that with the existing access to services the likelihood of residents using sustainable means of transport is low, opting for private vehicle transport. .

3.2.2 The Potential to Improve the Level of Sustainable Accessibility

31. A summary for the potential to improve the level of sustainable accessibility is given below with references to Figure 4:

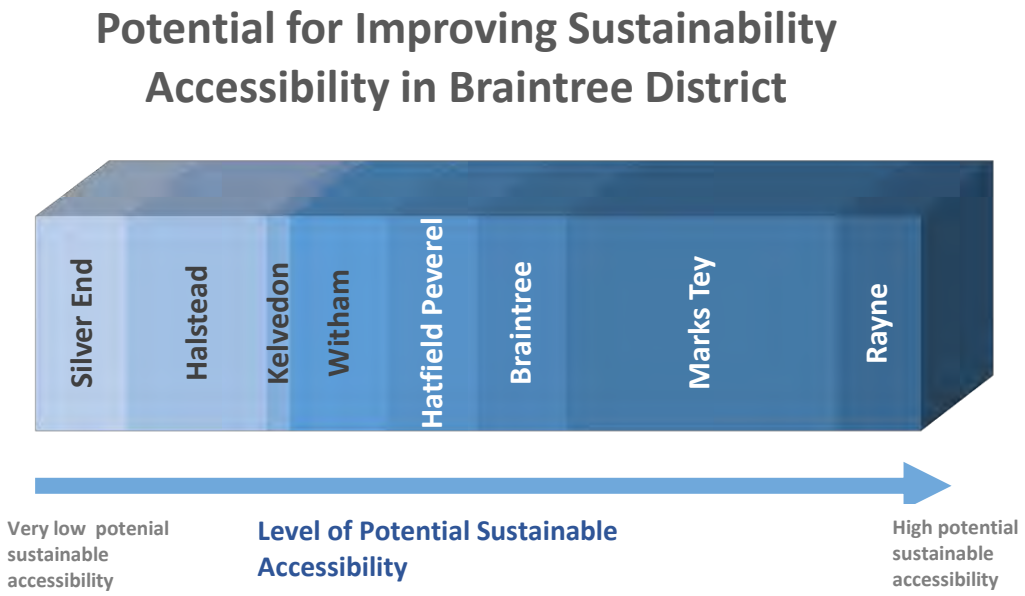


Figure 4: The potential to improve the sustainable accessibility achieved by sites in towns and villages in Braintree District

32. Sites in the regions of Rayne and Marks Tey have a significant potential to improve their sustainable accessibility. This is mainly due to the size of the site, which provides the potential to improve the sustainable accessibility in the following ways:

- Potential to redirect bus service(s) into the site as well as introducing additional bus stops within walking distance.
- Potential to have its own supply of schools, GP surgeries and even a town centre. As a result there is also a potential to encourage walking and cycling around the site, as long as adequate links are introduced.

33. Areas such as Silver End, Halstead, Kelvedon and Witham have low potential to improve the existing level of sustainable accessibility. This is due to:

- The size of the sites – if the sites are not of sufficient size, it is unlikely to sustain a bus service
- The current proximity and frequency of established bus links to local services – If the site has a sufficient amount of bus stops served with reasonable frequency, there is little potential to improve.
- The proximity of local services, such as a town and railway station affects the potential to encourage residents to cycle or walk to the local services. In the case of Halstead there is no nearby railway station.

3.2.3 Combined Existing and Potential levels of Sustainable Accessibility

34. The existing and potential levels of sustainable accessibility for each area were linked to show which sites possess the highest levels of sustainable accessibility within Braintree district.

35. Appendix B provides the scores and rankings for all sites, based on existing and potential accessibility. This provides an indication of the top ranked sites along with the least favoured sites.

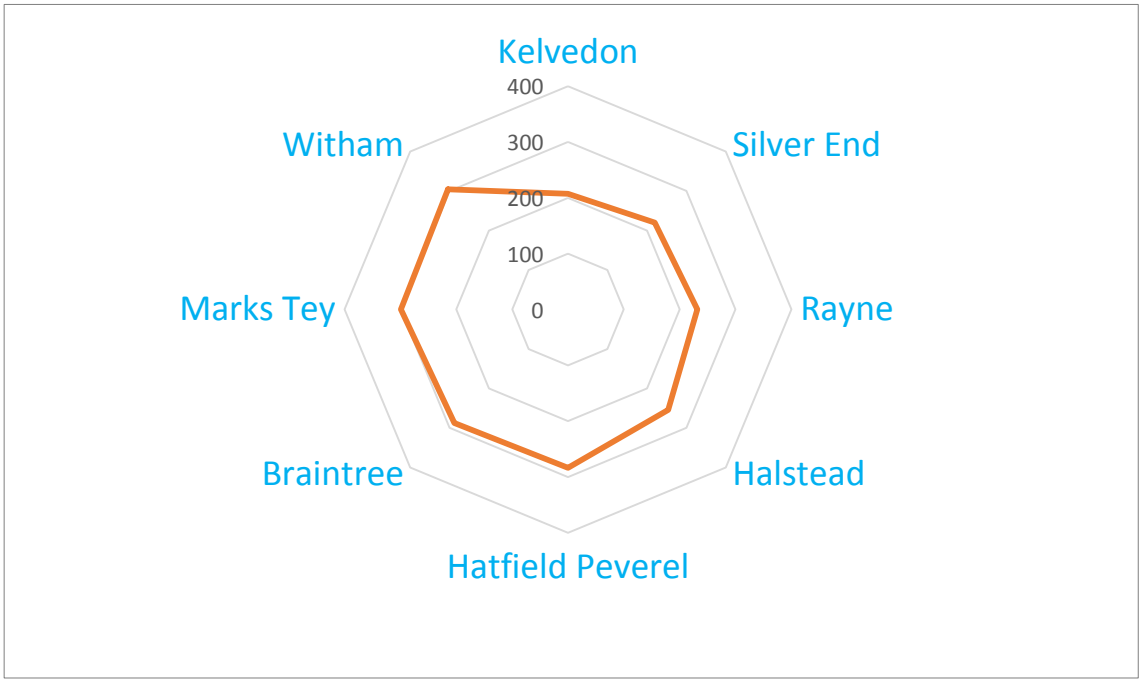


Figure 5: The average scores of the combined existing and potential sustainable accessibility for the Braintree District.

36. The sites that have been ranked within the high/good level of sustainable accessibility tend to be within the Witham, Marks Tey, Hatfield Peverel and Braintree areas.

37. Braintree contains sites varying from limited to good levels of existing sustainable accessibility with the potential to improve. This makes the sites around Braintree rank highly on the sustainable accessibility.

- In particular the site BLAN 114 has been ranked the highest out of all sites. Not only is the site close to frequent bus services to the town centre and rail station it also has the potential to redirect bus services into the site. Due to the size of the site and the proximity to the bus routes there is also a possibility to increase the frequency to the local area.

38. Witham, on the other hand, mainly contains LP sites with excellent existing sustainable accessibility but with good or limited potential for further improvement.

- The top ranking site in Witham is WITN 428. The site is located near to a bus service running frequently to local services, as well as being within walking distance to all nearby schools. These factors attribute to a high existing sustainable accessibility ranking. As well as scoring highly in terms of existing sustainability, it also has the potential to improve. The site is of a reasonable size, so has the potential to redirect a bus service into the site. All of the above factors allow the site to score highly in terms of sustainable accessibility.

39. The LP site in Marks Tey (FEER 231) has scored highly due to its size and proximity to the bus services, meaning it has both existing and potential sustainable accessibility. Even though the site is away from established services, it is within walking distance to a frequent and regular bus service, linking the site to the nearby town. Due to the size of the site there is potential to redirect and improve the existing bus service. This allows the site to have sustainable accessibility during the plan period which may improve as the site develops. With all large sites there is a possibility that the site can develop internal shopping facilities, GP surgeries, schools and other amenities which improves the sustainable accessibility of the site.

40. However, proposed development sites around Silver End, Halstead, Rayne and Kelvedon have received low combined ranking.

41. With regards to Rayne this is due to the distance between the sites and town centre, as a result of being in a rural location. There are also a limited amount of bus services within these areas, increasing the likelihood of the sites having a high car dependency. This implies that the sites have low existing sustainable accessibility.

42. The sites in Rayne (GRSA 269, GRSA 270) have obtained a low ranking overall, but should also be viewed over a longer term. It has very limited existing sustainable accessibility, due to location and lack of public transport. The site would have low levels of sustainable accessibility during the plan period but in the long term could become highly accessible by sustainable transport. This is due to possibilities such as, having its own shopping facilities, GP surgeries and schools with a direct and frequent bus services to/from the site. There is also the possibility to introduce cycle infrastructure, thus reducing the remoteness of its current location.

4 Strategy Options Development

4.1 Methodology

43. In order to meet BDC's target of 14,000 homes and 10,000 jobs by 2033, 11 strategies were developed using a combination of sites to fit a broad theme, such as 'developments centred on Braintree'. All sites were included in at least 2 scenarios, however the majority are in 3 or more. A range of scenarios and sites were used to assist BDC in gaining a picture of the high level impact of the various sites on particular routes and key junctions. This will inform the selection of a preferred option, once considered alongside other evidence.

44. All strategies contained the committed development, thus reducing the number of houses and jobs that needed to be found from the remaining "optional" developments. Table 11, below, outlines the amount of committed development, the amount of housing and jobs available from the "optional" developments and the remainder of the targets that needed to be found from those developments.

Table 11: Summary of Housing and Job requirements

	2033 Target (16 years)	Committed (Sites included)	Amount available from sites listed	Amount required for target
Houses	14,000	2,390	21,252	11,610
Jobs	10,000	1,542	13,244	8,458

45. Eight separate strategies were developed, with a further three developed to consider one site, Skyline 2/Eastlink 120 as pure employment. There are current proposals for a mixed use site, however BDC would prefer the site as employment only. The strategies were developed based on all the sites available and were as follows:

- Excluding large sites (those with more than 2000 homes)
- Large development sites only
- Sites with a high combined sustainable transport accessibility assessment score
- Sites surrounding main towns
- Sites that, by location, avoid Galleys Corner
- Sites centred on Braintree
- Sites excluding those around Braintree

- Sites spread across the district
- Large development sites with Skyline stage 2/Eastlink 120 as employment
- Sites surrounding main towns with Skyline stage 2/Eastlink 120 as employment
- Sites centred on Braintree with Skyline stage 2/Eastlink 120 as employment

4.2 Summary of Strategies

46. Generally the strategies were either very close to or exceeded the housing and job targets, however there were a few that did not meet the jobs target, as can be seen in Table 12 below. This is of less concern as all the job numbers were assumed and so it is likely that some numbers will be higher than the assumption whilst others will be lower. The difference is also relatively small as can be seen in the Jobs Difference column of Table 12. The Houses Difference and Jobs Difference columns refer to the difference between the number of houses and jobs each scenario is providing in relation to the targets.

Table 12: Summary of Housing & Job numbers in each strategy

Scenario	Houses	Houses Difference	Jobs	Jobs Difference
1	11,623	13	8,762	304
2	11,940	330	8,859	401
3	11,836	226	8,258	-200
4	11,991	381	8,603	145
5	11,636	26	8,389	-69
6	11,681	71	8,517	59
7	12,128	518	8,439	-19
8	11,616	6	8,459	1
9	11,630	20	8,649	191
10	11,676	66	8,839	381
11	11,765	155	8,645	187

47. Appendix C shows which developments have been included in each strategy option.

4.3 Summary of Impacts

48. Table 13, below, shows the total traffic flows that each scenario will generate, using the trip generation as described in Section 5.1.2, at the key junctions in the AM and PM peaks. This was calculated, prior to the Options Workshop, by summing the percentage increase of the development flows on

each key junction arm. The colouring indicates the level of development flows (Red = high flows, Green = low flows).

Table 13: Total traffic flows through the key junctions per scenario

	Scenario										
	1	2	3	4	5	6	7	8	9	10	11
AM	18,065	19,370	16,953	19,398	17,777	20,173	17,828	15,707	15,707	19,942	17,716
PM	16,719	18,657	18,940	20,280	16,146	21,615	16,276	15,416	16,325	20,123	19,654

49. Scenarios 4, 6 and 10 generate some of the highest traffic flows at the key junctions, whilst Scenarios 8 and 9 have the lowest flows. The variation between flows occurs due to differences in the developments included in each scenario as some have a lower trip generation than others, whilst the trips generated will also take different routes through the network depending on the developments available, hence why there is a difference of around 5,000 vehicles between the highest and lowest scenarios.

5 VISUM Network Assignment

5.1 Methodology

5.1.1 Building and coding the network

50. The network was taken as a cordon from the Chelmsford VISUM model and was enhanced in terms of links and junctions as required. Zones were developed by combining 2011 Census output areas of a similar nature. The development areas were also incorporated as zones. Where site access information was not provided, it was assumed that access would be made from the nearest road.

51. Each of the links in the network were assigned an average speed by direction for the AM and PM peak hours. Journey times were be taken from analysis already undertaken for Braintree District from the 2013/2014 Trafficmaster dataset, using 0800-0900 and 1700-1800 average speeds for weekdays in neutral months. Where the sample size within this data was not sufficient, speeds were estimated based on similar roads in the district. Trafficmaster plots can be found in Appendix D to provide an insight into the existing situation in the peak periods.

5.1.2 Trip generation and Distribution

52. In order to estimate the traffic flows generated by the developments within the Braintree Local Plan, trip rates have been estimated using the TRICS database. Trip rates have been ascertained for each of the development's land use sub-categories across residential, retail and employment sectors. Sites surveyed at weekends, or in Greater London, Ireland & Northern Ireland, were not used.

53. To make the figure more applicable to Braintree district, the percentage of people who drive to work for each TRICS site was applied. This used Census 2011 data at a Local Authority (county/unitary) level. These percentages were compared to Braintree and the proportions applied to each TRICS site.

54. An overall trip rate was calculated for arrivals and departures in AM (0800-0900) and PM (1700-1800) peak hours for all relevant land use sub-categories. Each development was assigned a location type in-line with those used in TRICS (Town Centre, Edge of Town Centre, Suburban Area, Edge of Town and Neighbourhood Centre). This allowed greater differentiation between developments based on their location. However, this also created the potential

for low sample sizes. To overcome this, it was necessary to combine the residential land use sub-categories A (privately owned houses), B (affordable/local authority houses), C (privately owned flats) and D (affordable/local authority flats). It was also necessary to use the overall trip rate for shopping centre/local shops due to the restrictive sample size within TRICS.

55. Each development was assigned a land-use type or, with mixed-use developments, a combination of land uses that would meet the site size. For residential land uses the Census middle layer super output area (MSOA) was used to apply an expected housing split based on the census characteristics – whether the housing development would be houses or flats.

56. The trips were distributed using existing 2011 Census Journey to work data and VISUM then assigned these to the network using the routes with the shortest journey time. However there were no capacity restrictions on the network and so current speed on the link, taken from Trafficmaster, was the only determinant of route assignment.

5.2 Results

57. After running each development scenario through VISUM it is possible to obtain a graphical representation of the traffic flows to and from proposed developments on each link and also results in a tabular form. The graphical representations were used to show the percentage increase on each link leading into the key junctions, along with the level of flows on the network at the Options Sifting Workshop.

6 Options Sifting

6.1 Options Workshop

58. An options workshop was held on Thursday 5th November 2015 to discuss the 11 scenarios and sift those down to a maximum of 6 scenarios. The workshop was attended by the following people:

- Alan Lindsay – Essex County Council
- Andrew Connelly – Essex County Council
- Catherine Goodwin – Essex Highways Transport Planning
- Charles Freeman – Essex Highways Transport Planning
- Emma Goodings – Braintree District Council
- Kevin Fraser – Essex County Council
- Mark Norman – Highways England
- Matthew Bradley – Essex County Council
- Neil Jones – Braintree District Council
- Theunis Kruger – Essex Highways Transport Planning

59. A presentation was given by the Essex Highways Transport Planning team to highlight the varying impacts of each scenario and VISUM was also used to look closely in each scenario at the trip generation and distribution.

60. Six scenarios were identified to take forward to the next stage of the work based on several factors including removing those that had the worst impact in Transport terms, ensuring a varied range of developments and development scenarios were maintained and removing those with a large number of sites that did not score well in the sustainable transport assessment.

61. Post meeting, it was agreed that Scenario 1 would be altered slightly to remove the large development at Witham due to its high impact in transport terms and scenarios containing the Skyline 2 development were also altered so that all used Option 1 of being only an employment site. Maps of the final six scenarios can be found in Appendix E and Table 14, below, summarises the proposed housing and job numbers in each scenario.

Table 14: Summary of the six strategies chosen for further investigation

Scenario	Houses	Houses Difference	Jobs	Jobs Difference
1 (Excluding large sites)	11,623	13	8,762	304
2 (Large developments only)	11,940	330	8,859	401
3 (sites with high sustainable transport scores)	11,836	226	8,258	-200
8 (sites spread across the district)	11,616	6	8,459	1
9 Large sites as employment)	11,630	20	8,649	191
11 (Centred around Braintree)	11,765	155	8,645	187

7 NTEM Comparison

62. A comparison with the National Trip End Model (NTEM) forecast was undertaken for the six scenarios taken forward from the workshop and the results are shown in Table 15 and Table 16 below. The difference between what was forecast by NTEM, shown in the NTEM Growth column for each NTEM zone, and the level of proposed development in each NTEM zone is shown under each scenario column.

Table 15: Difference between housing development in each NTEM zone and forecast NTEM growth

			Scenario					
Zone	**Code**	**NTEM Growth**	**1**	**2**	**3**	**8**	**9**	**11**
Rural	22UC0	1440	+2654	+7060	+6799	+6675	+7060	+5277
Braintree	22UC1	1658	+2900	+662	-838	-838	+312	+1820
Witham	22UC2	773	+1322	+347	+2004	+582	+347	+347
Halstead	22UC3	363	+63	-363	-363	+338	-363	-363
Kelvedon	22UC4	157	-157	-157	-157	-117	-117	-157
Coggeshall	22UC5	153	-153	-153	-153	-153	-153	-153
Silver End	22UC6	144	+306	-144	-144	+306	-144	+306
Earls Colne	22UC7	212	-212	-212	-212	-212	-212	-212
Hatfield Peverel	22UC8	120	-120	-120	-120	15	-120	-120
Sible Hedingham	22UC9	197	-197	-197	-197	-197	-197	-197
Total		**5217**						

Table 16: Difference between employment development in each NTEM zone and forecast NTEM growth

			Scenario					
Zone	**Code**	**NTEM Growth**	**1**	**2**	**3**	**8**	**9**	**11**
Rural	22UC0	580	+1954	+3985	+5023	+3908	+3985	+3638
Braintree	22UC1	1011	+4247	+1854	-35	+1990	+2240	+2583
Witham	22UC2	647	+186	+186	+436	+186	+186	+186
Halstead	22UC3	213	-76	+383	+383	-76	-213	-213
Kelvedon	22UC4	61	-61	-61	-61	-61	-61	-61
Coggeshall	22UC5	64	-64	-64	-64	-64	-64	-64
Silver End	22UC6	55	-55	-55	-55	-55	-55	-55
Earls Colne	22UC7	36	-36	-36	-36	-36	-36	-36
Hatfield Peverel	22UC8	41	-41	-41	-41	-41	-41	-41
Sible Hedingham	22UC9	64	-64	-64	-64	-64	-64	-64
Total		**2772**						

63. This comparison was undertaken to demonstrate how much growth authorities and planners would already be aware of from the existing Department for Transport (DfT) NTEM forecasts.

64. The results show that there will be significantly more development than the NTEM is currently forecasting for Braintree District with around 6,500 more homes and 5,750 more jobs than the forecast. This is around 200% more homes and 300% more jobs than the forecast.

8 Junction Modelling

8.1 Methodology

8.1.1 Junction Selection

65. Base models for all key junctions, listed in Section 1.2, were created. The original methodology proposed 10 junctions to be modelled in each scenario, however it was found that each matrix could be created quickly and efficiently and all scenarios run with ease, thus allowing for a comparison of all scenarios at each junction, providing a more detailed analysis. A map of the key junctions can be found in Appendix F and the numbers relate to the corresponding section below (e.g. **1** = 8.2.**1,** Aetheric Road - Pierrefitte Way).

8.1.2 Modelling

66. Junctions 9 software was used to model both priority junctions using its PICADY tool and also roundabouts using its ARCADY tool.

67. In terms of model outputs, the performance and operation of a junction in PICADY/ARCADY is given by the length of delay and Ratio of Flow to Capacity (RFC) for each approach. The software considers a delay of 36 seconds to be unacceptable, however this is open to opinion and interpretation (i.e. a delay of 50 seconds at a junction may be considered acceptable, depending on people's view). Generally, as the RFC approaches 1.0, the approach is said to be nearing capacity, therefore any approach with an RFC above 1.0 exceeds the theoretical capacity and is likely to suffer from significant vehicle queues and delays. An RFC of between 0.85 and 1.0 is usually taken as an indication that an approach has reached its practical capacity and where vehicles will start to experience noticeable delay and congestion.

68. For all base models actual 15-minute flows were entered, except for signalised junctions where it is only possible to enter the data in hourly segments. However due to likely high demands and peak spreading, a flat hourly average data was entered in the forecast models.

69. The signalised junction options were assessed using LinSig V3.2.22. The software is used for the assessment and design of traffic signal junctions either individually or as a network comprised of a number of junctions. It is used by traffic engineers to construct a model of the junction or network which can then be used to assess different designs and methods of operation.

70. Two signalised junctions were included in the key junctions list and so were assessed using LinSig. In terms of model outputs, the performance and operation of a junction in LinSig is given by the length of delay and percentage degree of saturation for each approach. Generally, as the degree of saturation approaches 100%, the approach is said to be nearing capacity, therefore any approach with a degree of saturation above 100% exceeds the theoretical capacity and is likely to suffer from significant vehicle queues and delays. A degree of saturation of between 90% and 100% is usually taken as an indication that an approach has reached its practical capacity and where vehicles will start to experience noticeable delay and congestion.

71. The AM and PM peak hours were modelled for all scenarios. It was found from looking at the count data from across the district that the average AM and PM peak hours occur 0800 - 0900 and 1700 - 1800 respectively.

8.1.3 Panfield Link

72. As part of the plans for the Panfield Lane site (referenced PANF CS) two new link roads have been proposed. The site is located north of Springwood Drive and so access will be provided through the end of Springwood Drive and a link to Panfield Lane has been proposed after 66 houses have been occupied (Phase 1). A link to the Panfield Lane – Churchill Road roundabout will also be created as part of Phase 2 and it is envisaged that the entire site will be developed by 2033, therefore the Phase 2 link has also been included in the VISUM model as proposed in the site plan (See Appendix G).

73. Due to the congested nature of the existing network, the introduction of the Panfield link in the model attracted considerable through traffic from both existing and development trips. Although the link is planned to generous standards (7.3m limited direct access UAP3 standards), it is not anticipated that it will be used as a form of “bypass” and so capacity in the model was restricted on the new links to limit through traffic.

74. Despite this, the link still showed an impact on all the junctions in Braintree and so all the 2033 matrices had to be adjusted to allow for the impact of the link. This was done by distributing the 2011 census journey to work trips across the existing network and a network with the link included to identify the difference in flows at each junction. The base year flows were then adjusted accordingly to provide a basis from which to produce the 2033 matrices.

8.1.4 Background Growth

75. Local plan preparation is being progressed by the neighbouring districts of Colchester, Chelmsford, Tendring and Uttlesford, and each have undertaken an `Issues and Options' public consultation. All authorities are progressing plan preparation to a `Preferred Option', with the intention to undertake public consultation in Summer 2016. At this stage all authorities will have confirmed their overall housing target, and its preferred spatial strategy for delivering growth into the early 2030's and beyond. At present there is no clear certainty of the overall scale and distribution of this growth. Consequently, the best available traffic forecast information for these districts comes from the Department for Transport's National Trip End Model (NTEM).

76. Background growth from neighbouring districts was estimated using TEMPRro (NTEM V6.2). Using TEMPro's alternative assumptions tool, housing and job forecasts in Braintree district were set at the same level in 2033 as in the base year (2015), i.e. no growth in Braintree district. This enabled the calculation of trip end growth factors which only include growth from outside the district.

77. Based on the location of each junction, the corresponding TEMPro zone was identified, along with the whether the arms of the junction were classified as rural or urban roads[2]. Each junction arm was also defined as a Trunk, Principal or Minor road. Based on the combination of TEMPro zone, road classification and road type, traffic growth factors from 2015 to 2033 were calculated from the trip end growth factors using the National Transport Model (NTM) Road Traffic Forecasts 2015 (Scenario 1). These were applied to the base flows on each arm of the junctions. A table of these results can be found in Appendix H. The flows entering each key junction were then extracted from VISUM and added to the base flows which incorporated the background growth. The graphical results of each scenario, both AM and PM, can be found in Appendix I.

8.2 Results

78. The majority of the junction models used traffic flows obtained from traffic counts carried out in 2015. Five models used older counts (2013 & 2014) and so DfT long term count data in the district was checked for any growth trends. It was found that there had been little recent historic growth to warrant adjustment of pre 2015 counts. All scenarios include the Panfield Link and its subsequent impacts – more detail can be found in Section 8.1.3.

[2] https://www.gov.uk/government/publications/road-traffic-forecasts-2015

79. For ease of reference, results have been displayed in two tables for each junction (AM & PM). Each table shows the base year results and results for all six scenarios.

80. For priority junctions and roundabouts, an RFC of between 0.75 and 0.85 has been highlighted in orange, whilst an RFC of 0.85 or above has been highlighted in red. Similarly this has been done for signalised junctions where a degree of saturation between 75 and 85% has been highlighted in orange and 85% or above has been highlighted in red. Orange indicates that the junction is nearing capacity, whilst red indicates that the junction is at or over capacity. For all junctions a delay of over 40 seconds has been highlighted in red. Whilst any junction with an RFC or degree of saturation below 0.75 or 75% has sufficient capacity and so has been highlighted in green.

81. The future year scenarios any roundabout junction approach which exceeds an RFC of 1.40 or above will have OC (Over Capacity) in the results table to indicate that the demand on the approach is well over capacity and that the approach will not cope with the traffic demand trying to use the network at these points.

82. All signalised junctions have been optimised in the future year scenarios to obtain the best performance possible from the current layout with the predicted flows from each development scenario. The maximum signal cycle time used was 120 seconds, anything longer would prove detrimental to pedestrians in terms of the waiting time to cross.

83. Capacity results are displayed as Degree of Saturation for signalised junctions and Ratio of Flow to Capacity (RFC) for all other junctions. The different definitions are from the software used to model the different types of junction and mean the same thing. Delay results are shown as delay per passenger car unit for signalised junctions and delay per vehicle for all other junctions. Both are shown in seconds and are in principle the same.

8.2.1 Aetheric Road – Pierrefitte Way

84. Junction Arms:

- Aetheric Road – A
- Rayne Road East – B
- Pierrefitte Way – C
- Rayne Road West – D

Table 17: Aetheric Road - Pierrefitte Way AM Results

		Turning Movement				
		A - BCD	B – ACD	C - AD	C - B	D - ABC
Base Year	Deg. Of Sat	104.2%	8.6%	99.6%	74%	104%
	Delay/PCU	173.2	42	133.8	75.3	173.2
Scenario 1	Deg. Of Sat	118.9	8.9	121.1	74.2	121
	Delay/PCU	357.5	40.2	415.9	71.6	408.1
Scenario 2	Deg. Of Sat	115.8	8.0	114.7	70.2	115.6
	Delay/PCU	317.3	43.9	327.7	66.7	331.7
Scenario 3	Deg. Of Sat	105.7	8.6	100.4	78	105.8
	Delay/PCU	167.6	39.3	135.2	77.5	193
Scenario 8	Deg. Of Sat	105.6	8	106.7	82.5	104.8
	Delay/PCU	167.6	43.9	213.2	86.7	176.9
Scenario 9	Deg. Of Sat	110	8.6	106.7	82.5	110.8
	Delay/PCU	230.1	39.3	213	86.7	265.6
Scenario 11	Deg. Of Sat	115.3	8.9	115.6	88.1	113
	Delay/PCU	305.3	40.2	295.8	102.7	297.6

Table 18: Aetheric Road - Pierrefitte Way PM Results

		Turning Movement				
		A - BCD	B – ACD	C - AD	C - B	D - ABC
Base Year	Deg. Of Sat	95.3	48.9	94.2	46.6	94
	Delay/PCU	94.1	53.5	89.1	51.6	62
Scenario 1	Deg. Of Sat	114.6	52.8	114.2	39.9	111.0
	Delay/PCU	89.8	66.2	314.3	42.3	280.1
Scenario 2	Deg. Of Sat	98.2	51.5	99.2	49.4	96.6
	Delay/PCU	89.1	62.1	111.7	48.2	99.4
Scenario 3	Deg. Of Sat	95.0	49.1	93.7	39.9	94.2
	Delay/PCU	71.5	62.9	76.2	42.3	96.0
Scenario 8	Deg. Of Sat	88.0	50.9	89.5	44.6	86.9
	Delay/PCU	53.1	63.7	65.8	44.2	72.5
Scenario 9	Deg. Of Sat	98.4	55.0	96.7	47.7	95.2
	Delay/PCU	85.4	68.8	94.2	46.8	102.6
Scenario 11	Deg. Of Sat	108.8	53.2	109.3	38.7	107.2
	Delay/PCU	219.5	68.2	241.0	41.2	231.2

85. The Aetheric Road – Pierrefitte Way junction is already at capacity in both the AM and PM peaks. The Panfield Link was found to have a significant impact in the AM peak by reducing the amount of traffic making the right turn out of Aetheric Road to Rayne Road West. There was also a significant reduction in traffic entering from Rayne Road West in the PM peak. However despite the impact of the link, this will not be sufficient to reduce demand sufficiently at the junction to prevent delay with the junction near to, at or over capacity in all scenarios.

86. Modelling suggests that Scenario 3 has the least impact in the 2033 AM peak and the junction will have a similar level of capacity to the base year, however there will be a slight decrease in delay for traffic entering the junction from Aetheric Road but delay will be slightly increased for those entering from the eastern and western Rayne Road arms.

87. Modelling indicates that Scenario 8 has the least impact in the 2033 PM peak and the junction remains just under capacity, however the overall performance of the junction improves with a reduction in both delay and capacity. The junction appears to be the cause of network issues, particularly in the current PM peak, affecting Springwood Drive and Panners Interchange however due to the likely increase in demand at both of those junctions, further investigation will be required to see if a reduction in delay and capacity at the Aetheric Road – Pierrefitte Way junction will help ease the network issues.

8.2.2 Broad Road, Braintree

Table 19: Broad Road AM Results

		Junction Arm		
		A131 N	A131 S	Broad Rd
Base Year	RFC	0.74	0.51	0.38
	Delay (s)	8.58	4.85	5.61
Scenario 1	RFC	0.83	0.96	0.39
	Delay (s)	14.72	41.60	6.50
Scenario 2	RFC	0.79	1.02	0.36
	Delay (s)	11.76	87.48	6.72
Scenario 3	RFC	0.87	1.06	0.36
	Delay (s)	18.28	138.21	6.83
Scenario 8	RFC	0.76	0.89	0.32
	Delay (s)	10.06	21.19	6.02
Scenario 9	RFC	0.80	0.98	0.31
	Delay (s)	12.30	50.16	5.77
Scenario 11	RFC	0.93	1.15	0.39
	Delay (s)	31.77	372.66	6.48

Table 20: Broad Road PM Results

		Junction Arm		
		A131 N	A131 S	Broad Rd
Base Year	RFC	0.54	0.51	0.61
	Delay (s)	5.22	4.15	9.85
Scenario 1	RFC	0.95	0.72	0.85
	Delay (s)	43.81	7.68	25.88
Scenario 2	RFC	0.92	0.64	0.71
	Delay (s)	27.51	6.08	13.54
Scenario 3	RFC	1.02	0.72	0.86
	Delay (s)	120.73	7.48	30.34
Scenario 8	RFC	0.86	0.59	0.64
	Delay (s)	16.44	5.18	10.70
Scenario 9	RFC	0.90	0.69	0.68
	Delay (s)	23.28	6.76	12.14
Scenario 11	RFC	1.11	0.84	1.14
	Delay (s)	366.09	12.77	416.50

88. Broad Road currently appears to operate under capacity in both peak periods, however the junction is likely to be operating near to or at capacity in 2033, particularly in the PM peak.

89. Modelling suggests that Scenario 8 has the least impact in both of the 2033 peak periods, although the A131 North and A131 South arms are likely to be near to capacity in the AM, whilst the A131 North arm is likely to be near to capacity in the PM peak.

8.2.3 Church Lane, Braintree

Table 21: Church Lane AM Results

		Junction Arm		
		Church Lane	Convent Hill	Bradford St
Base Year	RFC	0.80	1.00	0.62
	Delay (s)	23.90	69.86	8.72
Scenario 1	RFC	0.88	OC	0.59
	Delay (s)	36.58	OC	9.61
Scenario 2	RFC	0.82	OC	0.57
	Delay (s)	25.57	OC	9.44
Scenario 3	RFC	0.80	OC	0.56
	Delay (s)	23.22	OC	8.65
Scenario 8	RFC	0.77	OC	0.53
	Delay (s)	20.68	OC	8.52
Scenario 9	RFC	0.95	OC	0.57
	Delay (s)	59.47	OC	9.44
Scenario 11	RFC	0.95	OC	0.63
	Delay (s)	59.30	OC	10.35

Table 22: Church Lane PM Results

		Junction Arm		
		Church Lane	Convent Hill	Bradford St
Base Year	RFC	0.99	0.56	0.93
	Delay (s)	78.21	8.82	32.58
Scenario 1	RFC	OC	0.75	1.27
	Delay (s)	OC	15.31	728.29
Scenario 2	RFC	1.39	0.68	1.15
	Delay (s)	966.91	12.51	356.02
Scenario 3	RFC	OC	0.60	1.16
	Delay (s)	OC	9.75	392.16
Scenario 8	RFC	1.29	0.59	1.09
	Delay (s)	674.24	9.89	205.02
Scenario 9	RFC	1.32	0.77	1.23
	Delay (s)	785.16	17.52	586.82
Scenario 11	RFC	OC	0.72	1.37
	Delay (s)	OC	13.60	1047.38

90. Church Lane is modelled to be operating at capacity in both the AM and PM peaks and so the addition of more traffic tips the junction well over capacity in many of the scenarios.

91. Scenario 8 was found to have the least impact in both of the 2033 peak periods, however Convent Hill will be well over capacity in the AM peak and both Church Lane and Bradford Street will be over capacity in the PM peak.

8.2.4 Marks Farm, Braintree

Table 23: Marks Farm AM Results

		Junction Arm			
		A131 N	A120 E	A120 S	Coggeshall Rd
Base Year	RFC	0.78	0.78	0.76	0.50
	Delay (s)	17.85	17.58	5.59	7.43
Scenario 1	RFC	0.96	1.14	1.01	OC
	Delay (s)	53.4	218	83.7	OC
Scenario 2	RFC	OC	OC	1.35	OC
	Delay (s)	OC	OC	1063.1	OC
Scenario 3	RFC	1.11	1.36	1.22	OC
	Delay (s)	256.5	948.6	690.1	OC
Scenario 8	RFC	1.21	1.35	1.18	OC
	Delay (s)	506.7	937	566.1	OC
Scenario 9	RFC	OC	OC	1.29	OC
	Delay (s)	OC	OC	899.8	OC
Scenario 11	RFC	1.16	1.33	1.19	OC
	Delay (s)	397.3	849.1	583.2	OC

Table 24: Marks Farm PM Results

		Junction Arm			
		A131 N	A120 E	A120 S	Coggeshall Rd
Base Year	RFC	0.59	0.59	0.63	0.47
	Delay (s)	8.99	8.39	3.56	5.84
Scenario 1	RFC	OC	0.87	0.97	1.03
	Delay (s)	OC	30.5	31.4	71.0
Scenario 2	RFC	OC	1.19	1.30	OC
	Delay (s)	OC	536.3	965.9	OC
Scenario 3	RFC	OC	1.03	1.14	OC
	Delay (s)	OC	98.4	450.0	OC
Scenario 8	RFC	OC	0.95	1.12	OC
	Delay (s)	OC	45.1	377.2	OC
Scenario 9	RFC	OC	1.24	1.29	OC
	Delay (s)	OC	699.8	924.1	OC
Scenario 11	RFC	OC	1.20	1.17	OC
	Delay (s)	OC	506.3	533.3	OC

92. Modelling shows that Marks Farm roundabout currently operates under capacity in the AM peak and well under capacity in the PM peak. Although the junction modelling results show that the junction will be well over capacity in 2033, it is worth noting these could change with the introduction of a new or upgraded A120 Braintree to Marks Tey route, which has not been considered at this stage due to the lack of a confirmed preferred route / scheme.

93. As the junctions were assessed on an individual basis, based on current traffic flow, the junction could be shown to operate under capacity, however wider network issues, e.g. exit blocking, in this instance Galleys Corner, cause most of the problems at the junction. It is often the case that it is not the specific junction where congestion is evident that is the problem but rather wider issues that affect the junction.

94. Modelling suggests that Scenario 11 has the least impact on this junction in the 2033 AM peak, however the junction will be over capacity and there will be significant delay on all junction arms. Scenario 1 has the least impact in the 2033 PM peak and 3 arms of the junction are just under capacity with some delay. However the A131 North Arm of the junction is likely to be well over capacity.

8.2.5 Panners, Braintree

Table 25: Panners AM Results

		Junction Arm						
		Northern Rdbt			Southern Rdbt			
		Pods Brook	A131 Link	A120 W	A131 Link	A120 E	B1256	A131
Base Year	RFC	0.53	0.40	0.30	0.36	0.31	0.40	0.29
	Delay (s)	5.91	2.63	4.79	2.45	6.05	10.88	2.32
Scenario 1	RFC	OC	0.88	1.35	0.47	1.36	0.37	0.55
	Delay (s)	OC	13.9	881.7	3.2	1083	59.2	4.7
Scenario 2	RFC	OC	0.96	OC	0.42	1.09	0.34	0.56
	Delay (s)	OC	28.7	OC	2.9	269.6	51.4	5.1
Scenario 3	RFC	OC	0.63	0.53	0.49	0.76	0.15	0.38
	Delay (s)	OC	4.4	9.6	3.3	20.0	17.8	3.0
Scenario 8	RFC	OC	0.53	0.82	0.57	0.99	0.31	0.34
	Delay (s)	OC	3.6	21.0	3.9	94.7	47.1	2.6
Scenario 9	RFC	OC	0.53	0.92	0.56	0.94	0.27	0.36
	Delay (s)	OC	3.6	40.6	3.8	61.9	38.3	2.6
Scenario 11	RFC	OC	0.69	0.74	0.49	1.04	0.35	0.45
	Delay (s)	OC	5.4	20.0	3.4	180.2	53.4	3.2

Table 26: Panners PM Results

		Junction Arm						
		Northern Rdbt			Southern Rdbt			
		Pods Brook	A131 Link	A120 W	A131 Link	A120 E	B1256	A131
Base Year	RFC	0.64	0.34	0.55	0.52	0.39	0.40	0.21
	Delay (s)	10.30	2.41	5.57	3.20	8.57	10.95	2.00
Scenario 1	RFC	OC	0.81	OC	0.54	0.95	0.13	0.57
	Delay (s)	OC	8.0	OC	3.6	73.5	15.2	3.8
Scenario 2	RFC	OC	0.78	OC	0.50	1.07	0.18	0.42
	Delay (s)	OC	7.2	OC	3.1	219.6	22.2	2.8
Scenario 3	RFC	0.87	0.71	OC	0.56	0.92	0.14	0.41
	Delay (s)	27.1	5.3	OC	3.5	57.7	16.5	2.6
Scenario 8	RFC	0.96	0.69	OC	0.58	0.76	0.10	0.46
	Delay (s)	52.8	5.0	OC	3.7	23.2	11.8	2.7

		Junction Arm						
		Northern Rdbt			Southern Rdbt			
		Pods Brook	A131 Link	A120 W	A131 Link	A120 E	B1256	A131
Scenario 9	RFC	0.98	0.74	OC	0.57	0.94	0.14	0.50
	Delay (s)	62.7	5.9	OC	3.7	69.5	16.2	2.9
Scenario 11	RFC	0.96	0.75	OC	0.59	1.24	0.14	0.55
	Delay (s)	50.3	6.2	OC	4.0	753.0	16.6	3.4

95. Panners Interchange currently appears to operate well within capacity in both the AM and PM peaks, however it should be noted that it is impacted by congestion in the PM peak on Pods Brook Road and the A120 eastbound which occur as a result of wider network issues. As with Marks Farm, it is also likely the traffic flows at the junction will be impacted by the introduction of a new/upgraded A120 route.

96. Modelling suggests that Scenario 3 leads to the least impact in the 2033 AM peak, however Pods Brook Road will be well over capacity. Whilst in the PM peak, Scenario 8 is likely to have the least impact, however the A120 Westbound slip is also likely to be well over capacity. In summary, the junction will be over capacity in both the AM and PM peaks.

8.2.6 Springwood Drive, Braintree

Table 27: Springwood Drive AM Results

		Junction Arm			
		Springwood Drive	Rayne Rd E	Pods Brook Rd	Rayne Rd W
Base Year	RFC	0.34	0.69	0.68	0.46
	Delay (s)	6.73	7.88	8.39	7.31
Scenario 1	RFC	OC	OC	OC	1.30
	Delay (s)	OC	OC	OC	774.0
Scenario 2	RFC	1.37	OC	OC	1.27
	Delay (s)	1029.4	OC	OC	709.0
Scenario 3	RFC	0.82	0.96	0.90	0.61
	Delay (s)	23.7	41.9	28.6	14.6
Scenario 8	RFC	1.04	1.03	0.87	0.58
	Delay (s)	166.7	107.3	21.9	12.9
Scenario 9	RFC	1.21	1.09	0.93	0.63
	Delay (s)	604.2	203.7	36.51	16.0
Scenario 11	RFC	1.38	1.21	1.01	0.99
	Delay (s)	1011.2	457.5	96.3	78.5

Table 28: Springwood Drive PM Results

		Junction Arm			
		Springwood Drive	Rayne Rd E	Pods Brook Rd	Rayne Rd W
Base Year	RFC	0.70	0.42	0.52	0.26
	Delay (s)	11.45	4.89	5.00	4.52
Scenario 1	RFC	1.29	0.87	1.20	OC
	Delay (s)	761.9	27.5	626.0	OC
Scenario 2	RFC	OC	0.81	1.07	1.36
	Delay (s)	OC	20.2	246.7	1035.5
Scenario 3	RFC	1.00	0.53	0.77	0.31
	Delay (s)	76.8	6.9	11.6	6.5
Scenario 8	RFC	0.99	0.55	0.91	0.35
	Delay (s)	68.0	7.0	26.7	8.0
Scenario 9	RFC	0.99	0.60	1.00	0.40
	Delay (s)	70.1	7.9	85.9	9.2
Scenario 11	RFC	1.06	0.65	1.07	0.53
	Delay (s)	143.5	9.5	241.3	11.0

97. Modelling indicates that Springwood Drive operates under capacity in both peaks, however exit blocking does occur due to congestion on Rayne Road East in the PM peak which impacts on the amount of traffic that can exit from Springwood Drive and those turning right from Pods Brook Road.

98. Modelling suggests that Scenario 3 has the least impact in both the 2033 AM and PM peaks, however the junction is likely to be near to capacity on all arms except Rayne Road West in the AM. Whilst in the PM, the Springwood Drive arm will be at capacity. With the existing network issues as they are, it is possible there will be even greater delay at the junction due to the increased demand.

8.2.7 Colne Road – A120, Coggeshall

99. Junction Arms:

- A120 E – A
- Colne Rd S – B
- A120 W – C
- Colne Rd N - D

Table 29: Colne Road AM Results

		Turning Movement					
		D - A	D - BC	A - D	B - C	B - AD	C - B
Base Year	RFC	0.30	0.79	0.33	0.23	0.51	0.24
	Delay (s)	22.81	38.67	11.02	13.23	23.20	13.34
Scenario 1	RFC	OC	OC	0.74	OC	OC	0.72
	Delay (s)	OC	OC	31.5	OC	OC	66.1
Scenario 2	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 3	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 8	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 9	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 11	RFC	OC	OC	0.70	OC	OC	0.79
	Delay (s)	OC	OC	31.6	OC	OC	84.7

Table 30: Colne Road PM Results

		Turning Movement					
		D - A	D - BC	A - D	B - C	B - AD	C - B
Base Year	RFC	0.30	0.63	0.20	0.20	0.50	0.09
	Delay (s)	14.40	24.88	11.72	11.44	19.81	8.90
Scenario 1	RFC	1.16	1.23	0.29	1.07	1.11	0.19
	Delay (s)	650.42	569.69	15.33	416.35	308.57	14.81
Scenario 2	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 3	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 8	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 9	RFC	OC	OC	OC	OC	OC	OC
	Delay (s)	OC	OC	OC	OC	OC	OC
Scenario 11	RFC	1.09	1.17	0.28	1.03	1.05	0.16
	Delay (s)	486.86	406.67	15.21	321.30	227.13	13.79

100. Although the A120 – Colne Road junction operates comfortably under capacity currently, the A120 is running close to capacity and so the increase in flows on the A120 restrict all turning movements sending the junction over capacity in all 2033 AM and PM scenarios. However, it is worth noting these could change with the introduction of a new or upgraded A120 Braintree to Marks Tey route, which has not been considered at this stage as a preferred option has not been confirmed yet.

101. In the 2033 AM peak, Scenario 1 is modelled to have the least impact, although all turning movements are well over capacity except the right turns from each direction of the A120. Scenario 11 is likely to have the least impact in the 2033 PM peak with all movements, except the right turns from each direction on the A120, over capacity.

8.2.8 A131 – London Road, Great Notley

Table 31: A131 – London Road AM Results

		Junction Arm			
		A131 N	London Rd NE	London Rd SE	A131 S
Base Year	RFC	0.36	0.57	0.16	0.29
	Delay (s)	2.34	5.79	4.59	2.01
Scenario 1	RFC	0.70	1.05	0.25	0.52
	Delay (s)	5.3	155.3	8.1	3.2
Scenario 2	RFC	0.62	0.76	0.22	0.45
	Delay (s)	4.1	12.1	6.8	2.7
Scenario 3	RFC	0.62	0.87	0.21	0.42
	Delay (s)	4.2	17.5	6.5	2.5
Scenario 8	RFC	0.59	0.76	0.21	0.43
	Delay (s)	3.8	11.9	6.6	2.6
Scenario 9	RFC	0.60	0.78	0.22	0.44
	Delay (s)	3.9	12.9	6.8	2.7
Scenario 11	RFC	0.67	0.98	0.24	0.50
	Delay (s)	4.9	53.7	7.5	3.0

Table 32: A131 – London Road PM Results

		Junction Arm			
		A131 N	London Rd NE	London Rd SE	A131 S
Base Year	RFC	0.39	0.31	0.22	0.50
	Delay (s)	2.97	3.29	3.51	2.60
Scenario 1	RFC	0.95	0.54	0.33	0.79
	Delay (s)	23.3	5.5	5.4	6.8
Scenario 2	RFC	0.83	0.35	0.31	0.72
	Delay (s)	10.1	4.2	5.0	4.9
Scenario 3	RFC	0.77	0.48	0.29	0.81
	Delay (s)	8.7	4.6	4.6	7.1
Scenario 8	RFC	0.78	0.32	0.28	0.70
	Delay (s)	8.0	3.8	4.4	4.5
Scenario 9	RFC	0.82	0.34	0.30	0.71
	Delay (s)	9.4	4.1	4.8	4.7
Scenario 11	RFC	0.99	0.54	0.33	0.87
	Delay (s)	43.8	5.5	5.4	10.6

102. The A131 – London Road junction appears to operate well within capacity and remains just under capacity in all 2033 scenarios, both AM and PM.

103. In both of the 2033 peak periods, Scenario 8 is modelled to have the least impact, with only the London Road arm nearing capacity in the AM peak and only the A131 North arm nearing capacity in the PM peak.

8.2.9 Cuckoo Way, Great Notley

Table 33: Cuckoo Way AM Results

		Junction Arm		
		A131 N	Cuckoo Way	A131 S
Base Year	RFC	0.31	0.31	0.53
	Delay (s)	2.08	3.07	4.76
Scenario 1	RFC	0.62	0.48	0.74
	Delay (s)	4.0	5.7	8.5
Scenario 2	RFC	0.59	0.47	0.72
	Delay (s)	3.7	5.3	8.1
Scenario 3	RFC	0.55	0.43	0.59
	Delay (s)	3.3	4.7	5.6
Scenario 8	RFC	0.55	0.43	0.63
	Delay (s)	3.3	4.7	6.2
Scenario 9	RFC	0.57	0.44	0.65
	Delay (s)	3.5	4.9	6.5
Scenario 11	RFC	0.60	0.46	0.66
	Delay (s)	3.7	5.2	6.6

Table 34: Cuckoo Way PM Results

		Junction Arm		
		A131 N	Cuckoo Way	A131 S
Base Year	RFC	0.37	0.31	0.51
	Delay (s)	2.22	2.92	4.25
Scenario 1	RFC	0.72	0.43	0.81
	Delay (s)	4.9	5.2	11.2
Scenario 2	RFC	0.75	0.44	0.79
	Delay (s)	5.6	5.5	10.3
Scenario 3	RFC	0.61	0.36	0.66
	Delay (s)	3.6	4.1	6.4
Scenario 8	RFC	0.63	0.38	0.74
	Delay (s)	3.8	4.3	8.2
Scenario 9	RFC	0.67	0.40	0.76
	Delay (s)	4.2	4.6	8.9
Scenario 11	RFC	0.68	0.40	0.75
	Delay (s)	4.3	4.7	8.8

104. Modelling indicates that Cuckoo Way currently operates well within capacity in both peaks and continues to operate well in all 2033 scenarios. It should be noted that the proposals for the Skyline 2 development show an access point off the existing roundabout, thus creating a new arm. However as this development has not yet been confirmed only the existing 3 arms have been modelled.

105. In both 2033 peaks, modelling indicates that Scenario 3 has the least impact with the junction under capacity in both the AM and PM peaks.

8.2.10 Head Street, Halstead

Table 35: Head Street AM Results

		Junction Arm						
		Eastern Mini Rdbt				Western Mini Rdbt		
		A131	A1124	A131 Link	A131 Link	Parsonage St	A131	A1124
Base Year	RFC	1.02	0.94	0.78	0.98	1.35	0.84	0.61
	Delay (s)	54.61	55.46	14.23	45.07	333.72	26.22	14.82
Scenario 1	RFC	1.19	0.97	0.86	1.02	OC	0.97	0.53
	Delay (s)	473.73	107.03	24.01	90.28	OC	64.13	14.59
Scenario 2	RFC	1.09	1.04	0.86	1.04	OC	0.97	0.53
	Delay (s)	230.23	174.72	23.89	123.31	OC	62.66	14.53
Scenario 3	RFC	1.07	1.01	0.86	1.03	OC	0.97	0.53
	Delay (s)	178.37	131.68	23.96	103.72	OC	63.44	14.56
Scenario 8	RFC	1.18	1.00	0.86	1.02	OC	0.97	0.53
	Delay (s)	454.53	126.80	24.00	89.86	OC	64.14	14.59
Scenario 9	RFC	1.12	0.90	0.86	0.99	OC	0.98	0.53
	Delay (s)	280.77	61.45	24.19	56.04	OC	67.81	14.70
Scenario 11	RFC	1.12	0.89	0.86	1.00	OC	0.98	0.53
	Delay (s)	276.94	61.41	24.14	61.78	OC	66.97	14.68

Table 36: Head Street PM Results

		Junction Arm						
		Eastern Mini Rdbt				Western Mini Rdbt		
		A131	A1124	A131 Link	A131 Link	Parsonage St	A131	A1124
Base Year	RFC	1.02	0.98	0.92	1.00	1.58	1.03	0.76
	Delay (s)	56.61	79.30	36.00	67.52	1809.18	100.15	26.60
Scenario 1	RFC	1.23	1.37	1.07	1.08	OC	1.34	1.03
	Delay (s)	614.08	986.72	140.48	197.18	OC	1009.80	157.23
Scenario 2	RFC	1.23	OC	1.06	1.09	OC	1.34	1.02
	Delay (s)	579.61	OC	124.04	218.87	OC	1010.53	156.60
Scenario 3	RFC	1.22	OC	1.06	1.09	OC	1.34	1.02
	Delay (s)	563.89	OC	124.45	219.91	OC	1010.64	156.55
Scenario 8	RFC	1.25	OC	1.07	1.08	OC	1.34	1.03
	Delay (s)	671.46	OC	132.42	202.26	OC	1009.72	157.13
Scenario 9	RFC	1.23	1.35	1.07	1.07	OC	1.34	1.03
	Delay (s)	589.76	930.12	142.39	175.59	OC	1010.02	157.77
Scenario 11	RFC	1.22	1.28	1.08	1.08	OC	1.34	1.03
	Delay (s)	579.18	721.80	151.20	171.17	OC	1011.21	157.73

106. The junction is currently modelled to be operating at capacity and so in all scenarios the increased traffic flows will further exacerbate the existing congestion issues within Halstead.

107. Modelling suggests that Scenario 3 has the least impact in both of the 2033 peak periods, however there is likely to be significant delay and all arms of the junction are likely to be over capacity.

8.2.11 Maldon Rd – The Street, Hatfield Peverel

Table 37: Maldon Road - The Street AM Results

		Junction Arm		
		The Street E	Maldon Rd	The Street W
Base Year	RFC	0.57	0.86	0.55
	Delay (s)	9.92	26.39	7.85
Scenario 1	RFC	1.00	1.38	0.73
	Delay (s)	112.44	1151.53	14.60
Scenario 2	RFC	0.71	1.19	0.59
	Delay (s)	14.84	510.62	10.09
Scenario 3	RFC	0.99	1.36	0.72
	Delay (s)	99.31	1079.83	14.22
Scenario 8	RFC	1.00	1.40	0.73
	Delay (s)	117.56	1198.84	14.88
Scenario 9	RFC	0.71	1.15	0.59
	Delay (s)	14.89	396.97	9.82
Scenario 11	RFC	0.70	1.10	0.57
	Delay (s)	14.26	258.25	9.40

Table 38: Maldon Road - The Street PM Results

		Junction Arm		
		The Street E	Maldon Rd	The Street W
Base Year	RFC	0.56	0.75	0.90
	Delay (s)	10.22	16.48	30.29
Scenario 1	RFC	0.83	1.27	1.07
	Delay (s)	26.64	816.58	228.60
Scenario 2	RFC	0.70	0.93	0.95
	Delay (s)	14.86	47.53	52.06
Scenario 3	RFC	0.82	1.32	1.09
	Delay (s)	24.83	961.47	271.92
Scenario 8	RFC	0.84	1.29	1.08
	Delay (s)	27.69	857.40	243.78
Scenario 9	RFC	0.67	0.93	0.96
	Delay (s)	13.51	47.51	53.67
Scenario 11	RFC	0.63	0.93	0.96
	Delay (s)	12.20	50.23	54.31

108. Maldon Road – The Street currently operates under capacity, although modelling shows that Maldon Road does operate near capacity in both peaks. The majority of the development scenarios lead to the junction being over capacity, however Scenario 11 is largely under capacity in both AM and PM peaks, with the exception of Maldon Road in the AM peak, and is modelled to have the least impact.

8.2.12 Rye Mill Lane, Kelvedon

109. Junction Arms:

- London Road – A
- Inworth Road – B
- Feering Hill – C
- Rye Mill Lane – D

Table 39: Rye Mill Lane AM Results

		Turning Movement					
		D - A	D - BC	A - D	B - C	B - AD	C - B
Base Year	RFC	0.07	0.05	0.03	1.07	1.05	0.41
	Delay (s)	8.01	14.89	7.23	238.29	210.76	13.40
Scenario 1	RFC	OC	OC	0.04	OC	OC	1.03
	Delay (s)	OC	OC	16.91	OC	OC	144.64
Scenario 2	RFC	0.09	0.12	0.04	OC	OC	0.57
	Delay (s)	9.53	24.16	8.98	OC	OC	18.95
Scenario 3	RFC	0.09	0.12	0.04	OC	OC	0.61
	Delay (s)	9.62	23.96	9.06	OC	OC	20.61
Scenario 8	RFC	OC	OC	0.04	OC	OC	0.98
	Delay (s)	OC	OC	17.90	OC	OC	99.76
Scenario 9	RFC	0.09	0.11	0.04	OC	OC	0.57
	Delay (s)	9.44	23.02	8.91	OC	OC	18.36
Scenario 11	RFC	0.08	0.10	0.04	OC	OC	0.58
	Delay (s)	9.07	21.24	8.61	OC	OC	18.86

Table 40: Rye Mill Lane PM Results

		Turning Movement					
		D - A	D - BC	A - D	B - C	B - AD	C - B
Base Year	RFC	0.04	0.04	0.06	0.99	1.02	0.40
	Delay (s)	6.79	14.79	7.27	170.3	146.16	11.43
Scenario 1	RFC	OC	OC	0.09	OC	OC	1.15
	Delay (s)	OC	OC	15.55	OC	OC	431.88
Scenario 2	RFC	0.05	0.08	0.06	1.17	1.25	0.52
	Delay (s)	7.67	16.29	7.98	655.14	630.25	15.21
Scenario 3	RFC	0.05	0.10	0.07	1.39	OC	0.62
	Delay (s)	8.10	20.11	8.41	1325.22	OC	20.69
Scenario 8	RFC	0.05	0.60	0.09	OC	OC	1.12
	Delay (s)	7.57	197.53	14.25	OC	OC	32.34
Scenario 9	RFC	0.05	0.08	0.06	1.17	1.24	0.51
	Delay (s)	7.57	15.90	7.89	653.75	629.25	15.03
Scenario 11	RFC	0.05	0.09	0.06	1.32	OC	0.56
	Delay (s)	7.88	19.13	8.18	1109.51	OC	18.00

110. Modelling shows that Rye Mill Lane operates well under capacity in both peak periods with the exception of the Inworth Road arm which is just over capacity. Modelling suggests that Scenario 11 has the least impact in the 2033 AM peak, however the Inworth Road arm will be well over capacity. Scenario 9 is likely to have the least impact in the 2033 PM peak, with only a slight reduction in capacity on all arms, although Inworth Road is likely to be over capacity.

8.2.13 Chipping Hill, Witham

Table 41: Chipping Hill AM Results

		Junction Arm		
		Chipping Hill	The Avenue	Collingwood Rd
Base Year	RFC	0.99	0.82	0.54
	Delay (s)	74.10	30.93	9.79
Scenario 1	RFC	OC	1.16	0.77
	Delay (s)	OC	479.9	20.7
Scenario 2	RFC	OC	1.07	0.74
	Delay (s)	OC	258.8	18.6
Scenario 3	RFC	OC	1.33	0.86
	Delay (s)	OC	1018.2	30.9
Scenario 8	RFC	OC	1.09	0.74
	Delay (s)	OC	303.0	18.5
Scenario 9	RFC	OC	1.07	0.74
	Delay (s)	OC	269.0	18.7
Scenario 11	RFC	OC	1.16	0.82
	Delay (s)	OC	492.8	26.3

Table 42: Chipping Hill PM Results

		Junction Arm		
		Chipping Hill	The Avenue	Collingwood Rd
Base Year	RFC	0.80	0.96	0.67
	Delay (s)	14.71	64.40	13.92
Scenario 1	RFC	1.09	OC	0.80
	Delay (s)	325.6	OC	21.5
Scenario 2	RFC	1.03	OC	0.81
	Delay (s)	159.8	OC	22.6
Scenario 3	RFC	OC	OC	0.77
	Delay (s)	OC	OC	18.6
Scenario 8	RFC	1.02	1.39	0.79
	Delay (s)	136.2	1012.8	21.2
Scenario 9	RFC	1.04	OC	0.80
	Delay (s)	172.5	OC	21.6
Scenario 11	RFC	OC	OC	0.74
	Delay (s)	OC	OC	16.8

111. The VISUM assignment showed significant re-routing of development traffic to avoid the Newland Street, Collingwood Road junction. As a result trips used The Grove and then continued up The Avenue, instead of Collingwood Road and likewise did the same in the opposite direction. Whilst this is plausible, it is rather estimated that 50% of trips would not re-route in this way and therefore 50% of trips have been removed from The Avenue and added to Collingwood Road. 50% of trips from Chipping Hill to the Avenue have also been reassigned to Collingwood Road. This subsequently impacts on the signalised junction at Newland Street, Collingwood road and so has been taken into account in Section 8.2.14.

112. Chipping Hill is currently modelled as operating near to capacity in both the AM and PM peaks. In the 2033 AM, all scenarios are likely to lead to Chipping Hill being well over capacity and in the 2033 PM, all scenarios are likely to lead to The Avenue being well over capacity. In the 2033 AM peak, Scenario 2 has the least impact however the junction is over capacity, whilst in the 2033 PM peak, Scenario 8 has the least impact but again the junction is over capacity.

8.2.14 Newland Street, Witham

113. Junction Arms:

- Newland Street North-East – A
- Maldon Road – B
- Newland Street South-West – C
- Collingwood Road – D

Table 43: Newland Street AM Results

		Turning Movement						
		C – A	C – B	Link SW - BC	B - CA	Link NE – DA	A - CD	D - AC
Base Year	Deg. Of Sat	40.6%	26.2%	33.9%	73.2%	43.4%	36.6%	58.3%
	Delay/PCU	36.3	38.1	4.0	55.2	6.1	38.7	47.3
Scenario 1	Deg. Of Sat	35.3	76.8	80.9	109.7	44.0	108.0	110.5
	Delay/PCU	32.4	115.8	11.6	268.7	7.4	217.1	290.2
Scenario 2	Deg. Of Sat	35.7	70.7	78.0	99.1	44.1	98.1	96.6
	Delay/PCU	33.3	94.8	9.8	144.3	7.4	95.7	125.8
Scenario 3	Deg. Of Sat	37.5	77.0	81.7	119.0	47.7	119.9	117.1
	Delay/PCU	33.6	117.3	12.0	389.6	8.0	388.6	379.0
Scenario 8	Deg. Of Sat	35.3	76.7	80.7	103.0	43.9	106.9	106.8
	Delay/PCU	32.4	115.5	11.5	183.9	7.3	200.8	239.2
Scenario 9	Deg. Of Sat	36.4	72.6	79.3	96.8	44.7	101.1	97.5
	Delay/PCU	34.1	101.7	11.2	124.3	7.0	124.9	132.2
Scenario 11	Deg. Of Sat	36.7	76.7	80.1	103.1	47.6	101.4	101.7
	Delay/PCU	35.0	116.9	11.7	180.1	7.9	129.6	171.0

Table 44: Newland Street PM Results

		Turning Movement						
		C – A	C – B	Link SW - BC	B - CA	Link NE – DA	A - CD	D - AC
Base Year	Deg. Of Sat	47.2%	76.9%	61.6%	80.2%	43.5%	82.3%	102.3%
	Delay/PCU	36.5	91.4	6.8	64.8	6.8	55	159.5
Scenario 1	Deg. Of Sat	43.7	120.0	75.6	116.2	44.6	110.6	117.0
	Delay/PCU	37.9	460.0	8.8	366.0	8.3	260.8	365.3
Scenario 2	Deg. Of Sat	48.6	105.8	73.1	115.0	48.0	114.7	96.7
	Delay/PCU	42.4	283.9	8.4	350.5	9.3	324.6	98.9
Scenario 3	Deg. Of Sat	55.1	122.1	77.6	135.2	53.5	134.4	134.4
	Delay/PCU	47.7	488.3	9.2	589.6	11.5	575.3	575.5
Scenario 8	Deg. Of Sat	49.1	117.4	74.2	115.4	48.3	116.8	99.4
	Delay/PCU	41.6	429.9	8.6	355.7	9.0	353.5	120.0
Scenario 9	Deg. Of Sat	44.7	119.8	74.9	115.4	45.2	105.3	107.8
	Delay/PCU	38.9	457.0	8.7	355.5	8.5	185.8	231.8
Scenario 11	Deg. Of Sat	52.5	121.7	76.8	122.6	50.9	123.4	124.0
	Delay/PCU	47.0	483.2	9.3	448.4	10.8	446.5	451.7

114. The VISUM assignment showed significant re-routing to avoid this junction when travelling from Maldon Road. Vehicles were shown to use The Grove. Although plausible it is not expected that all vehicles would re-route in this way and so 50% of the vehicles were reassigned through the junction from Maldon Road. Similarly it was found that all traffic accessing the Maltings Lane development and areas in the south of Witham would travel down the A12 and use junction 20B to double back and access Witham from the south. Whilst this is plausible as it is a quicker route, it is not believed all traffic would do this and so 50% of traffic making this movement, was reassigned to use junction 22 and travel through Witham from the north. This has subsequently also been taken into account in sections 8.2.15 and 9.1.

115. In the current AM peak, the signalised junction is modelled to operate under capacity, however the current PM peak it does near capacity on some arms and exceeds capacity on the Collingwood Road arm.

116. In the 2033 AM peak, Scenario 2 is modelled to have the least impact with the junction remaining just under capacity, whilst in the 2033 PM peak, Scenario 1 is likely to have the least impact, although capacity is exceeded on the majority of movements.

8.2.15 Gershwin Blvd, Witham

Table 45: Gershwin Blvd AM Results

		Junction Arm			
		Hatfield Rd NE	Gershwin Blvd	Hatfield Rd SE	New Arm
Base Year	RFC	0.49	0.34	0.44	-
	Delay (s)	4.48	4.48	4.35	-
Scenario 1	RFC	1.21	0.71	0.62	0.60
	Delay (s)	626.4	16.5	6.6	10.8
Scenario 2	RFC	0.99	0.65	0.61	0.41
	Delay (s)	69.7	12.3	6.4	7.3
Scenario 3	RFC	1.34	0.71	0.60	0.41
	Delay (s)	981.0	16.4	6.2	7.3
Scenario 8	RFC	1.03	0.66	0.62	0.41
	Delay (s)	127.0	12.8	6.5	7.3
Scenario 9	RFC	0.99	0.64	0.61	0.41
	Delay (s)	66.2	11.9	6.4	7.3
Scenario 11	RFC	1.23	0.68	0.59	0.41
	Delay (s)	681.5	14.8	6.1	7.2

Table 46: Gershwin Blvd PM Results

		Junction Arm			
		Hatfield Rd NE	Gershwin Blvd	Hatfield Rd SE	New Arm
Base Year	RFC	0.37	0.23	0.70	-
	Delay (s)	3.67	3.28	7.25	-
Scenario 1	RFC	0.62	1.18	0.78	0.62
	Delay (s)	6.8	489.6	10.7	12.2
Scenario 2	RFC	0.57	0.99	0.72	0.49
	Delay (s)	5.9	72.0	8.4	9.1
Scenario 3	RFC	0.58	1.38	0.72	0.49
	Delay (s)	5.9	1047.1	7.9	9.2
Scenario 8	RFC	0.59	1.04	0.73	0.50
	Delay (s)	6.09	139.3	8.6	9.3
Scenario 9	RFC	0.57	0.98	0.72	0.49
	Delay (s)	5.9	63.3	8.4	9.1
Scenario 11	RFC	0.56	1.22	0.70	0.48
	Delay (s)	5.7	616.8	7.7	8.8

117. As there is a committed development site (WITC 423) which plans to use the existing junction as an access point, a fourth arm has been modelled using the plans put forward in the developer's Transport Assessment (12/01071/OUT – Maltings Lane, Mayer Brown, July 2012). The existing junction operates well within capacity in both the AM and PM peaks.

118. In both 2033 peaks, Scenario 9 is modelled to have the least impact on the junction, however the North East Hatfield Road arm nears capacity in the AM, as does the Gershwin Blvd arm in the PM.

8.2.16 Rickstones Road, Witham

Table 47: Rickstones Road AM Results

		Junction Arm					
		Northern Mini Rdbt			Southern Mini Rdbt		
		Rickstones Road	B1018 Link	Cressing Road	B1018 Link	Cypress Road	Braintree Road
Base Year	RFC	0.58	0.77	0.97	0.90	0.69	0.67
	Delay (s)	14.73	14.10	60.85	25.76	37.68	8.43
Scenario 1	RFC	0.97	0.66	1.38	1.16	0.56	0.59
	Delay (s)	96.85	9.57	1140.67	430.92	36.68	6.92
Scenario 2	RFC	0.73	0.66	1.38	1.04	0.53	0.58
	Delay (s)	25.35	9.54	1147.66	128.46	34.68	6.77
Scenario 3	RFC	0.73	0.79	OC	1.04	0.53	0.70
	Delay (s)	25.25	15.56	OC	133.43	34.28	9.47
Scenario 8	RFC	0.80	0.64	OC	1.08	0.56	0.58
	Delay (s)	34.31	9.24	OC	210.39	36.87	6.66
Scenario 9	RFC	0.73	0.65	OC	1.04	0.53	0.58
	Delay (s)	25.34	9.42	OC	128.67	34.72	6.72
Scenario 11	RFC	0.76	0.71	OC	1.05	0.54	0.63
	Delay (s)	28.01	11.40	OC	151.18	35.59	7.64

Table 48: Rickstones Road PM Results

		Junction Arm					
		Northern Mini Rdbt			Southern Mini Rdbt		
		Rickstones Road	B1018 Link	Cressing Road	B1018 Link	Cypress Road	Braintree Road
Base Year	RFC	0.39	0.88	0.84	0.74	0.25	0.86
	Delay (s)	7.30	22.61	26.38	12.00	9.95	16.93
Scenario 1	RFC	0.40	0.90	1.09	0.87	0.69	0.87
	Delay (s)	9.46	26.95	279.66	24.84	29.74	18.99
Scenario 2	RFC	0.36	0.90	0.99	0.85	0.57	0.86
	Delay (s)	8.90	26.17	93.39	21.25	20.97	18.65
Scenario 3	RFC	0.40	0.96	OC	0.88	0.62	0.92
	Delay (s)	9.68	50.97	OC	26.40	24.99	30.18
Scenario 8	RFC	0.38	0.89	0.98	0.85	0.58	0.86
	Delay (s)	8.97	24.71	88.12	21.32	21.92	17.77
Scenario 9	RFC	0.37	0.90	1.03	0.87	0.58	0.87
	Delay (s)	9.24	26.67	157.68	23.77	22.23	18.92
Scenario 11	RFC	0.41	0.90	OC	0.89	0.63	0.86
	Delay (s)	9.94	25.90	OC	28.58	26.08	18.45

119. The Rickstones Road double mini roundabout is currently modelled to operate near to capacity in both peak periods, as a result the increased traffic flows in all 2033 scenarios tip the Cressing Road arm over capacity in both the AM and PM peaks.

120. Modelling suggests that Scenario 2 has the least impact in both 2033 peak periods, however in the AM peak, Cressing Road and the B1018 arms are over capacity, whilst in the PM peak, two arms of each mini-roundabout are over capacity.

8.3 Summary of Results

121. Overall the results of the junction modelling show that Scenario 3 is likely to have the least impact in the AM peak, whilst Scenario 8 is likely to have the least impact in the PM peak. Scenarios 1, 2 and 9 are likely to have the greatest impact in both peak periods on the junctions modelled.

122. Modelling shows that the majority of junctions are likely to be over capacity by 2033 and so it is likely there will be a need for mitigation measures. Existing Highway Boundaries at each junction have been investigated to see if mitigation would be possible. The outcome of this can be found in Section 10. However it is recommended that a consideration of the wider network impacts will need to be taken into account as there are already network issues, particularly in the PM peak.

123. A broad overview of mitigating measures proposed in the Core Strategy Work was undertaken as shown in Section 10.1. Detailed testing of the impact of mitigating measures at each junction and for each development scenario have however not yet been undertaken.

9 Strategic Network Impact

124. It was identified that the impact on the following A12 and A120 slips, along with the A120 / M11 junction, A120 / A12 junction and Galleys Corner would be assessed:

- A12 J24 On-slip / Off-slip (Kelvedon)
- A12 J23 On-slip / Off-slip (Kelvedon)
- A12 J22 On-slip / Off-slip (Witham)
- A12 J21 On-slip / Off-slip (Witham)
- A12 J20B On-slip / Off-slip (Hatfield Peverel)
- A12 J20A Off-slip (Hatfield Peverel)
- A12 J20A On-slip (Hatfield Peverel)

- A120 / B1417 Off-slip (Rayne)
- A120 / B1256 On-slip (Rayne)

125. The impact in terms of flow has been assessed for on- and off-slips in the six scenarios under consideration as shown in the sections to follow. However due to a lack of availability of either slip road or mainline TRADS data required to undertake the analysis, only three A12 slip roads could be assessed in detail in terms of capacity and design standards, namely:

- A12 J24 Off-slip (Kelvedon)
- A12 J23 Off-slip (Kelvedon)
- A12 J21 Off-slip (Witham)

126. It is recommended that the junctions be assessed in more detail, if required for a preferred scenario. This would require extensive additional traffic data collection.

9.1 A12 Slip Roads

127. In order to assess the suitability of the A12 slips to serve the development traffic that may use them, the method outlined in the Design Manual for Roads and Bridges (DMRB)[3] was to find the existing design category of the slip road and

[3] DMRB Vol.6, Section 2, Part 1, TD 22/06

then to estimate what category of slip road would be required with the level of development flows shown in each scenario. There are 5 slip road design categories, A-E, with A being the simplest most suitable for low mainline/slip traffic flows and E being the most complex suitable for high mainline/slip traffic flows. In Table 49, below, where a change is likely to be required the cell is highlighted in light red. The slip road design category is shown together with the number of downstream mainline lanes assumed.

Table 49: A12 Slip Road Categories

	Slip	Existing category	2033 w/o development	Scenario					
				1	2	3	8	9	11
AM	A12 J24 Off	A2	A2	C2	C2	C2	C2	C2	C2
	A12 J23 Off	A2	A2	A2	C2	C2	C2	C2	A2
	A12 J21 Off	A2	C2	C2	A3	A3	A3	A3	A3
PM	A12 J24 Off	A2	A2	A2	A2	C2	C2	A2	A2
	A12 J23 Off	A2	A3	C2	A3	A3	A3	A3	A3
	A12 J21 Off	A2	A3	D3	D3	D3	D3	D3	D3

128. This assessment indicates that Scenario 11 appears to have the least impact on the slip roads, whilst Scenario 1 is likely to have the most impact. However both the A12 J24 Off-slip and the A12 J21 Off-slip are likely to need alteration as all scenarios show a required change in the AM and PM peaks respectively. Whilst it is also quite likely that the A12 J23 Off-slip will require change as four of the six scenarios analysed in the AM peak show that a change will be required.

129. Table 50 and Table 51, below show the development flows that will use the A12 slip roads in the AM and PM peaks respectively. It is clear that there is likely to be a significant increase in flows on the On-slip of the A12 junction 23, whilst the A12 junction 24 Off-slip is not likely to see an increase in flows.

Table 50: A12 Slip road development flows AM

Link	Scenario					
	1	2	3	8	9	11
A12 J24 ON	99	24	24	121	27	0
A12 J24 OFF	116	0	0	63	1	6
A12 J23 ON	353	540	449	666	541	245
A12 J23 OFF	299	172	68	185	181	224
A12 J22 ON	31	43	43	60	43	0
A12 J22 OFF	196	197	237	254	197	130
A12 J21 ON	447	195	702	261	198	551
A12 J21 OFF	293	271	274	285	270	252
A12 J20B ON	406	349	393	467	319	243
A12 J20B OFF	281	156	283	306	156	127
A12 J20A ON	89	0	90	113	0	0
A12 J20A OFF	115	0	115	126	0	0

Table 51: A12 Slip road development flows PM

Link	Scenario					
	1	2	3	8	9	11
A12 J24 ON	111	12	12	91	14	0
A12 J24 OFF	143	7	128	87	9	134
A12 J23 ON	273	70	85	196	36	61
A12 J23 OFF	319	70	94	248	64	88
A12 J22 ON	75	62	104	102	62	26
A12 J22 OFF	272	229	288	273	226	166
A12 J21 ON	411	318	777	377	300	592
A12 J21 OFF	237	170	187	190	167	150
A12 J20B ON	444	293	489	482	291	259
A12 J20B OFF	166	135	185	231	107	60
A12 J20A ON	114	0	113	128	0	0
A12 J20A OFF	378	305	373	421	275	210

9.2 A120 Slip Impacts

130. The A120 / B1417 Off-slip and A120 / B1256 On-slip near Rayne were assessed to identify the level of impact the western “Garden Village” (GRSA 269/270) would have.

131. Table 52, below, shows the difference in development flows on the slip roads in each scenario.

Table 52: A120 On/Off-slip development flows near Rayne

Slip	Scenario					
	1	2	3	8	9	11
A120/B1417 Off-slip **(AM)**	17	1018	18	1050	1056	29
A120 /B1256 On-slip **(AM)**	46	1047	31	1105	1117	59
A120/B1417 Off-slip **(PM)**	54	907	34	966	975	24
A120 /B1256 On-slip **(PM)**	16	1035	14	1062	1068	64

132. It is clear from looking at the table above, that the "Garden Village" (GRSA 269/270) near Rayne, could add around 1,000 additional vehicles to the slip roads in both peaks by 2033. It is therefore recommended that access to the trunk road network from this site be assessed in greater detail should it feature in a preferred scenario.

9.3 A120 Junction Impacts

133. The tables below outline the development flows that would use the M11 / A120, A120 / A12 and Galleys Corner junctions in each scenario:

Table 53: Development Flows at the A120 / M11 Junction

Direction	Scenario					
	1	2	3	8	9	11
To M11 **(AM)**	801	1139	1000	959	1089	1064
From M11 **(AM)**	513	723	719	567	627	686
To M11 **(PM)**	619	873	880	703	781	869
From M11 **(PM)**	711	1004	933	852	969	999

134. Our assessment suggests that Scenario 1 is likely to have the least impact on the M11 / A120 junction in both peak periods in terms of volume of traffic flows heading to and from the junction. However this scenario is likely to have severe impacts on many of the key local junctions. Therefore of the three scenarios that are modelled to have the least impact on the key junctions (3, 8 & 11), Scenario 8 is likely to have the least impact on the M11 / A120 junction.

135. A review of M11 Junction 8 is currently being undertaken as part of a separate project but that is likely to need updating once a preferred Local Plan option has been chosen by BDC.

Table 54: Development Flows at the A120 / A12 Junction

	Direction	Scenario					
		1	2	3	8	9	11
AM	A12 NB	365	525	668	632	480	286
	A12 SB	321	128	228	217	129	186
	From A120	22	109	65	65	110	67
PM	A12 NB	395	472	724	652	520	389
	A12 SB	281	385	559	499	389	238
	From A120	103	577	412	499	544	120

136. Scenario 11 is likely to have the least impact on the A120 / A12 junction in both peak periods in terms of volume of traffic flows heading through the junction and coming from the A120. This scenario also has a lower impact on many of the key junctions than some of the other scenarios. Scenario 3 is likely to have the most impact on the A120 / A12 junction in both peak periods.

137. Depending on the preferred option chosen by BDC and the outcome of the A120 preferred option, it is quite likely that work will need to be undertaken to assess the impact on the A120 / A12 junction.

Table 55: Development flows entering Galleys Corner

	Entering From	Scenario					
		1	2	3	8	9	11
AM	A131	308	1186	698	806	1156	689
	Long Green	507	390	251	461	279	208
	B1018	21	95	757	50	81	789
	A120	785	1546	1201	1242	1375	1204
	Cressing Rd	75	193	102	116	158	118
PM	A131	462	1470	1262	922	1404	1352
	Long Green	550	437	310	522	439	353
	B1018	116	130	1027	83	113	1027
	A120	334	1102	616	807	976	626
	Cressing Rd	42	106	95	85	104	99

138. Modelling indicates that Scenario 1 is likely to have the least impact on Galleys Corner in both peak periods in terms of volume of traffic flows entering the junction from each arm. However this scenario is likely to have severe impacts on many of the key local junctions. Therefore of the three scenarios that have the least impact on the key junctions (3, 8 & 11), Scenario 8 is likely to have the least impact on Galleys Corner. In the AM peak, Scenario 2 is likely to have the most impact and in the PM peak, Scenario 11 is likely to have the most impact.

9.4 Sudbury Impacts

Table 56: Development traffic flows to and from Sudbury in both peak periods

Direction	Scenario					
	1	2	3	8	9	11
To Sudbury **(AM)**	43	50	48	51	35	40
From Sudbury **(AM)**	68	101	85	70	51	48
To Sudbury **(PM)**	64	88	86	60	43	53
From Sudbury **(PM)**	40	39	38	44	31	38

139. It is not anticipated that there will be significant traffic flows to or from Sudbury in any of the Scenarios. However Scenario 9 is likely to have the lowest traffic flows to and from Sudbury in both peak periods, whilst Scenario 2 is likely to have the highest.

10 Potential for Mitigation

10.1 2010 Core Strategy Mitigation Measures Review

140. The junctions reviewed in this section have not been included in Section 10.2.

10.1.1 Cuckoo Way

141. The mitigation measures proposed in 2010 were based on the assumption that a development would be built using the junction as an access point. This has as yet not come to fruition and could be uncertain. The previous mitigation measures proposed a “left in, left out” entrance for the development site to the south of the roundabout and in addition a left slip on the A131 southern arm of the roundabout, should it be required, do still appear to be the best options in terms of mitigation measures. However without updated modelling it is not possible to confirm this.

10.1.2 Springwood Drive

142. Widening some of the approaches and increasing the size of the roundabout within the existing highway boundary was previously suggested and this would still be an applicable mitigation measure. However the drawing provided would certainly need refining and a proper design undertaken to test the impacts of such mitigation measures. A study could be carried out to test the potential for an optimised traffic signal control within the existing highway land. Other town-wide mode-shift measures may be necessary in combination with any limited capacity mitigation measures.

10.1.3 Aetheric Road – Pierrefitte Way

143. It is understood that when the core strategy was written there was some doubt as to whether the Panfield Lane development would include a link and so the report recommended that the link is included to help relieve the junction. It is now known that the link will go ahead should the development be granted planning permission. It is likely to need a study of the potential for optimised traffic signal control within existing highway land. Other by-pass or mode-shift measures may be necessary in combination with any capacity improvement measures.

10.1.4 Gershwin Blvd

144. Planning permission has now been granted for the development site (Lodge Farm), subject to S106 agreement, which planned to use the junction as an access point. Therefore the mitigation measures proposed are no longer under

consideration, although it appears the developer has taken these into account with their plans for the junction.

10.1.5 Rickstones Road

145. Planning permission has now been granted for the Forest Road development site subject to S106 agreement. Two mitigation measures were previously tested, full signalisation of existing double mini roundabout or the conversion of the southern mini roundabout into a priority junction. It was found that the latter option would provide more capacity and this is the option that the developer has chosen to progress with.

10.2 Key Junctions

10.2.1 Broad Road

146. There is definite potential to increase capacity. It is likely to need a study of the topographical and land take constraints to provide a larger Inscribed Circle Diameter (ICD) roundabout. Capacity is likely to be limited by exit blocking of the single lane exits due to link capacity on the arms before this junction reaches capacity.

10.2.2 Church Lane

147. There is limited potential to increase capacity at junction. There is currently a mini roundabout, however there may be potential for traffic signals but a study would be required. Other by-pass or mode-shift measures may be necessary in combination with any limited capacity mitigation measures.

10.2.3 Marks Farm

148. There is definite potential to increase capacity. It is likely to need a study of the topographical and land take constraints to provide a larger ICD roundabout. Capacity is likely to be limited by exit blocking of the single lane exits due to link capacity on the arms before this junction reaches capacity.

10.2.4 Panners Interchange

149. There is definite potential to increase capacity, including an option for partial signalisation. It is likely to need study of the topographical and land take constraints to provide a larger ICD roundabout. Capacity is likely to be limited by the blocking of exits, particularly Pods Brook Road and the A120 eastbound slip. However there is definite potential to increase the capacity of the on and off-slips. It is likely to need study of the topographical and land take constraints to increase capacity of the slips.

10.2.5 A120 – Colne Road

150. There is definite potential to increase capacity. A study of a traffic signal control option in existing highway land could be carried out, but there also appears to be scope for land take and potentially a large ICD roundabout option or a grade separated option (with level changes and bridges) where A120 through traffic is not stopped, if necessary. It is known that this junction is currently subject to a study being undertaken by Highways England.

10.2.6 A131 – London Road

151. There is definite potential to increase capacity, including an option for partial signalisation. It is likely to need study of topographical and land take constraints to provide a larger ICD roundabout. Capacity is likely to be limited by exit blocking of the single lane exits due to link capacity on the arms before this junction reaches capacity.

10.2.7 A131 Head Street

152. There is limited potential to increase capacity at junction. It is likely to need a study of the potential for optimised traffic signal control within existing highway land. Other by-pass or mode-shift measures may be necessary in combination with any limited capacity mitigation measures.

10.2.8 The Street – Maldon Road

153. There is limited potential to increase capacity at junction. There is currently a mini roundabout and there is no scope for land take to permit a larger ICD roundabout. A study as part of the Maldon LDP work found that signals would also not be an option. A solution remains outstanding and so mode-shift measures have been encouraged in the short term to manage demand at the junction. It is however likely that a strategic solution, such as a by-pass is required.

10.2.9 Rye Mill Lane

154. There is limited potential to increase capacity, particularly along the B1024. It is likely to need a study of a traffic signal control option in existing highway land or land take to provide roundabout option. Other by-pass or mode-shift measures may be necessary in combination with any limited capacity mitigation measures.

10.2.10 Chipping Hill

155. There is limited potential to increase capacity at junction. It is likely to need a study of the potential for optimised traffic signal control in existing highway land. Building lines are set back from the junction, therefore some land take and a larger ICD roundabout may also be feasible.

10.2.11 Newland Street – Collingwood Road

156. There is limited potential to increase capacity at junction. It is likely to need a study of the existing signal control and assess the potential to optimise it. Other by-pass or town-wide mode-shift measures may be necessary in combination with any limited capacity mitigation measures.

10.3 A12 Slip Roads

10.3.1 A12 J24 On & Off-slips

157. There is definite potential to increase capacity. They are likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slips. Capacity is likely to be limited by the link capacity of the B1024 and junctions within Kelvedon before the existing Junction 24 reaches capacity.

10.3.2 A12 J23 On & Off-slips

158. There is definite potential to increase capacity. They are likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slips. Capacity is likely to be limited by the link capacity of the B1024 and junctions within Kelvedon before the existing Junction 23 reaches capacity.

10.3.3 A12 J22 On & Off-slips

159. There is definite potential to increase capacity. They are likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slips. Capacity is likely to be limited by the link capacity of the B1389 and junctions within Witham before the existing Junction 22 reaches capacity.

10.3.4 A12 J21 On & Off-Slips

160. There is definite potential to increase capacity. They are likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slips. Capacity is likely to be limited by the link capacity of the B1389 and junctions within Witham before the existing Junction 21 reaches capacity.

10.3.5 A12 J20B On & Off-Slips

161. There is limited potential to increase capacity. They are likely to need study of the topographical and land take constraints for a scheme to increase the capacity of the slips. They are also constrained by the proximity of nearby buildings. Capacity is likely to be limited by the link capacity of the B1137 and the

Maldon Road – The Street key junction below, before the slip roads reach capacity.

10.3.6 A12 J20A Off-Slip

162. There is limited potential to increase capacity. It is likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slip. It is also constrained by the proximity of nearby buildings. Capacity is likely to be limited by the link capacity of the B1137 and junctions within Hatfield Peverel before the off-slip reaches capacity.

10.3.7 A12 J20A On-Slip

163. There is limited potential to increase capacity. It is likely to need a study of the topographical and land take constraints for a scheme to increase the capacity of the slip. It is also constrained by the capacity of the priority right turn pocket on the B1137. Capacity is likely to be limited by the link capacity of the B1137 and junctions within Hatfield Peverel before the on-slip reaches capacity.

10.4 A120 Slip Roads

164. There is definite potential to increase capacity and to add A120 West connections. It is likely to need a study of topographical and of land take constraints for any scheme to increase capacity of the slips. Capacity is likely to be limited by the link capacities of the B1256 and B1417 and the B road junctions before the existing junction reaches capacity.

11 Conclusion

165. The 14,000 houses and 10,000 jobs required in Braintree District by 2033 are likely to put the current road network under considerable pressure with many of the key junctions identified failing to provide enough capacity. It is likely that a number of alterations will be required at these junctions, along with new infrastructure and greater provision of alternative methods of transport to encourage a modal shift.

166. Following a workshop to select scenarios for further investigation, six development scenarios were tested and their impacts on local junctions were assessed. Of these, scenarios 3, 8 & 11 were modelled to have a lesser impact than the other three on the key junctions. The volume of traffic flows adding to the strategic network at key points such as the M11 / A120 and A120 / A12 junctions was also extracted from VISUM to give a high level idea of the possible impact at these points. It was found that Scenario 1 is likely to have the least impact on the M11 / A120 junction and Galleys Corner, whilst Scenario 11 is likely to have the least impact on the A120 / A12 junction. As Scenario 1 is likely to have a significant impact on the majority of the key local junctions, the best scenario of the three that have the least impact on the key junctions is considered to be Scenario 8.

167. Therefore of the three scenarios that are modelled to have the least impact on the key study area junctions, modelling suggests that Scenario 8 is likely to have the least overall impact on the strategic network as well as the key junctions.

Appendix A: All Development Sites

Appendix A - Development Site Detail

Site Ref	Site Description	Type	Number of houses	Hectares	Number of jobs
BCBG 149	Land around Braintree Tenis/Football Club, Clockhouse Way/Chapel Hill	Residential	88	1.8	0
BLAN 114	Land east of Great Notley/South of Braintree	Residential & appropriate to scale other mixed uses	2000	100	1074
BOCN 132	Land bounded by A131, Broad Road and River Blackwater, Braintree	Mixed	1000	65.6	118
BOCN 137	Towerlands Park, between Panfield Lane and Deanery Hill	Mixed	1,150	42.79	250
BRAW 154	Land south west of Braintree (r/o Gilda Terrace)	Mixed	1,500	61	1889
CRESS 189	Braintree Garden Centre, Cressing Road, Braintree	<Null>	31	1.58	16
CRESS 191	Land on the west side of Mill Lane, Cressing	Residential	360	14.773	0
CRESS 195	Ivy Cottage, Long Green, Braintree	<Null>	10	0.34	3
CRESS 199	Land Between Leyfield & Derrygowna, Braintree Road, Tye Green	<Null>	12	0.4	4
CRESS 200	Land at 'Leyfield' Braintree Road, Tye Green	<Null>	4	0.25 approx (2515m2)	3
CRESS 202	Land South of Millennium Way, Braintree	<Null>	2000	Plot B3 - 4.67 h Plot B4 - 1.24 ha	1980
CRESS 203	Land South of Fowlers Farm Roundabout	<Null>	Included in CRESS 202 Assumptions	Plot B3 - 4.67 ha Plot B4 - 1.24 ha Plot B5 - 69.33 ha Plot B6 - 15.94 ha Total: 91.2 ha	Included in CRESS 202 Assumptions
CRESS 204	Land South of A120, West of Railway, Braintree	<Null>	Included in CRESS 202 Assumptions	As Above	Included in CRESS 202 Assumptions
CRESS 205	Land South of A120 East of Railway, Braintree	<Null>	Included in CRESS 202 Assumptions	As Above	Included in CRESS 202 Assumptions
CRESS 206	Land North of Tye Green, Braintree	<Null>	Included in CRESS 202 Assumptions	As Above	Included in CRESS 202 Assumptions
CRESS 209	Land South Of Fowlers Farm, Braintree	<Null>	Included in CRESS 202 Assumptions	As Above	Included in CRESS 202 Assumptions
CRESS 212	Land East of Braintree (Temple Boarder)	<Null>	2000	854 ha	1000
FEER 230	Land at Inworth Road, Feering	Residential	40	2 ha	0
FEER 231	Land West of Marks Tey	<Null>	3100	854 ha	1727
FEER 233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	Mixed	950	80 hectares (core development area 60 hectares)	200
GGHR 282	Land adjoining the east side of Bluebridge Ind Est, Halstead	Employment	0	4.82 hectares	137
GGHR 284	Ravens Avenue		275		
GGHR 307	Land Off Oak Road, Halstead	<Null>	300	11.76	138
GNBN 264	Land Between London Rd/Pods Brook Road and the A120	Residential	220	9.19	0
GNBN 265	Land North East of Queenborough Lane and south of Flitch Way, Braintree	Residential	420	23 ha	0
GNBN 266	Land south west of Braintree (between Flitch Way and A120)	Mixed	Included in BRAW 114 assumptions	61 ha	Included in BRAW 114 assumptions
GRNO 260 Option 1	Land west of A131 Great Notley	Employment		11ha	1780
GRNO 260 Option 2	Land west of A131 Great Notley	Mixed	497	40 ha	866
GRSA 269	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	Garden Village	3100	910 ha	1700
GRSA 270	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	Garden Village	Included in GRSA 269 assumptions	Included in GRSA 269 assumptions	Included in GRSA 269 assumptions
HASA 288	Land adjoining the west of Bluebridge Ind Est, Halstead	Employment	0	16.13 Hectares	459
HASA 289	Land at Cherry Tree Close, Halstead	Residential	28	0.824	0
HASA 293	Land east of Sudbury Road (The Sleights) adj Churchill Ave, Halstead	Residential	250	10.3 ha	0
HASA 295	Land off corner of Fenn Road and Brook Street, Halstead	Residential	44	2.31 hectares	0
HASA 513	Central Park, Halstead	Residential	104	3 ha	0
HATF 315	Land at Woodend Farm, London Road, Witham	Residential & community facilities	390	16 ha	0
HATF 316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	Residential	49	2 ha	0
HATF 317	Land off Gleneagles Way, Hatfield Peverel	Residential	135	5.2	0
HATF 321	Land Between Hatfield Peverel & Witham South of A12	<Null>	475	68 ha	681
HATR 306	Land at Oak Road & Tidings Hill, Halstead	<Null>	90	4.2	42
KELV 337	Land at London Road, between Crabb's Lane and Church Street, Kelvedon	Mixed	269	35.16 hectares (86.85 acres)	441
KELV 338	Land south of London Road, r/o no.s 61-95, Kelvedon	Country park associated with larger site	0	"	0
LIST 339	Former IFF site Liston, near Long Melford	Residential	100	32 ha	0
PANF 136	Land at Panfield, northwest of Springwood Industrial Estate	Employment	Not specified	7.9 ha	225
RIVE 360	Forest Road		370		45
RIVE 361	Land at The Old Rectory, Rivenhall	Residential/care home	85	3.5 approx	0
RIVE 366a	Forest Road, North East Witham, Phase 2a	Residential	350	22.4 ha in total	0
RIVE 366b	Forest Road, North East Witham, Phase 2b	Residential	Included in RIVE 366a assumptions	"	Included in RIVE 366a assumptions
SILV 388	Crittal Factory and adjacent site, Silver End	Residential	100	3.38 ha	0
SILV 389	North of Western Road. Silver End	Residential	350	16.79	0
WITC 423	Land at Lodge Farm, Witham		750		200
WITN 426	Land to north west of Conrad Road, Witham	Residential	150	5.4 ha approx	0
WITN 427	Land North of Conrad Road (redundant allotments), Witham	Residential	7	0.2927	0
WITN 428	Land adjacent Conrad Road/Elm Hall Cottages, Witham	Residential	1500	67.2 ha	250
WIS9E	Maltings Lane Business Park	Employment		3.8ha	588
PANF Core Strategy	Panfield Lane - Core Strategy Site	Mixed	600	15ha	751

Provided by Braintree
Assumed Number
<Null> Not provided - Mixed Use Assumed

Committed Development

N.B. We will assume a build rate of 100 homes per year and a job creation rate of 100 jobs per year over 15 years.

	Employment Assumptions				
	Type	GFA(m2)/Employee	GFA(HA)/Employee	Employees/HA	
Retail	A1	19.84	0.00	504.03	
Employment - Office	B1	19.38	0.00	516.00	*N.B. Assumed where there is B1 & B2 the split would be 20%, 80% respectively*
Employment - Industrial Units	B2	105.49	0.01	94.80	*N.B. Assumed where there is B1 & B2 & B8 the split would be 20%, 40%, 40% respectively*
Employment - Warehousing	B8	155.81	0.02	64.18	

N.B. Assumed only 30% of the site would be GFA.

Housing Assumptions	
Houses per heactare	Site Density
24.4	Assumed 58% of site would be housing, 22% open space and 20% infrastructure

Mixed/Null Assumptions	
Housing	Employment
80%	20%

Aspired Houses 2015 - 2033	17000
Aspired Houses 2017 - 2033	14000
Aspired Jobs:	12000

Committed Houses to be aware of	1610
Committed Houses	2390
Total Committed Houses	4000
Committed Jobs (Assumed)	1542

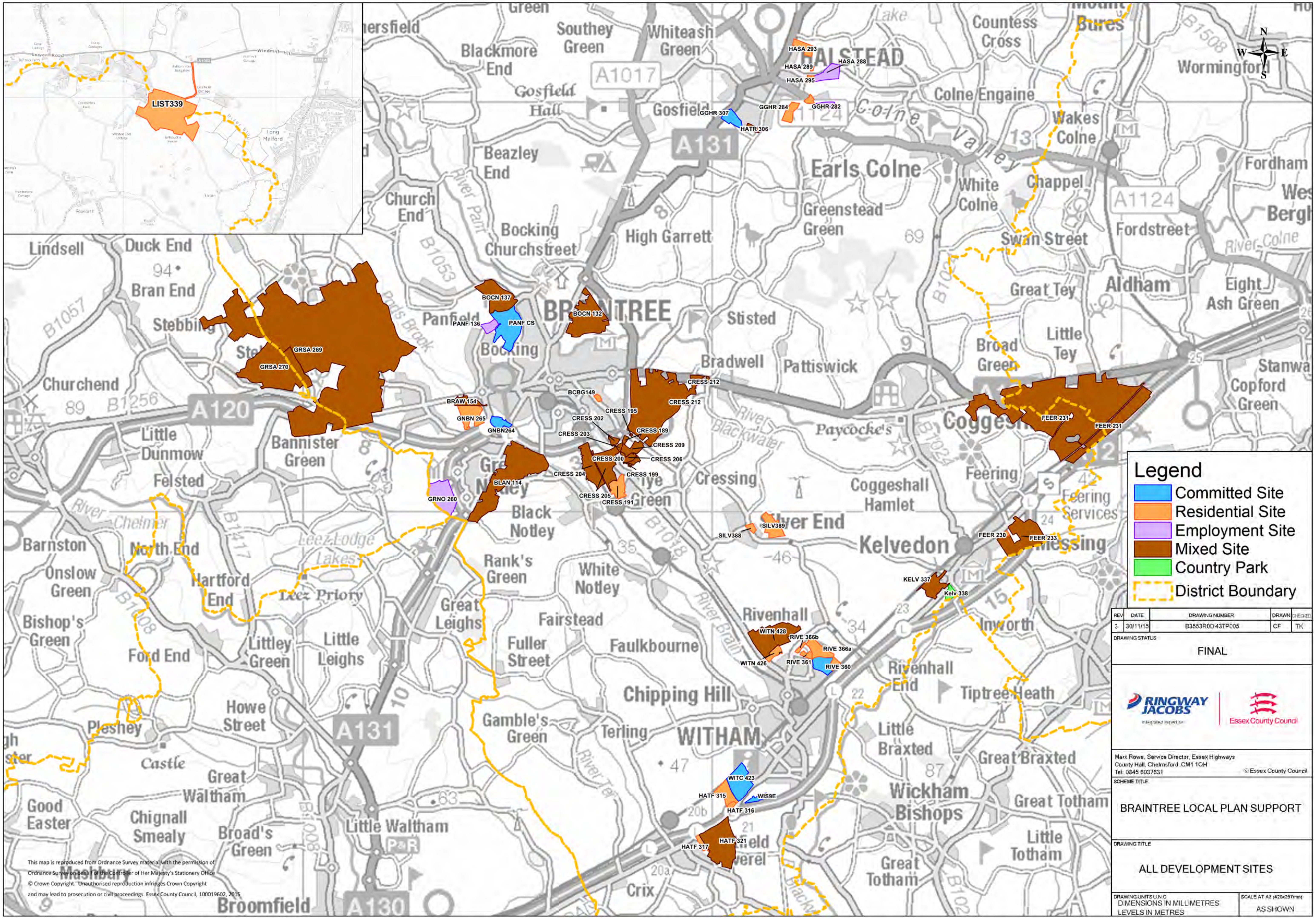
Houses Required by 2033	13000
Jobs required by 2033	10500

Known Houses	21058
Known Jobs	1449.999

Assumed Houses	965
Assumed Jobs	10923.89

Total Houses	22023.48
Total Jobs	12373.89

Houses Available	18023.48
Jobs Available	10832



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
3	30/11/15	B3553R0D43TP005	CF	TK

DRAWING STATUS
FINAL

RINGWAY JACOBS
Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE
BRAINTREE LOCAL PLAN SUPPORT

DRAWING TITLE
ALL DEVELOPMENT SITES

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN

Appendix B:
Sustainable Accessibility Assessment Rankings

Braintree Local Plan Highway Impact Assessment

SLAA Site Sustainable Accessibility Scores & Ranking: Based on existing accessibility

Rank	Area	Site Ref	Site Description	Weighted Score
1	Witham	RIVE 361	Land at The Old Rectory, Rivenhall	285
2	Braintree	BCBG 149	Land around Braintree Tennis/Football Club, Clockhouse Way/Chapel Hill	277
3	Witham	RIVE 366b	Forest Road, North East Witham, Phase 2b	275
4	Witham	WITN 426	Land to north west of Conrad Road, Witham	270
4	Witham	WITN 427	Land North of Conrad Road (redundant allotments), Witham	270
6	Witham	WITN 428	Land at Cressing Road, North of Elm Hall Cottages, Witham/Rivenhall	260
7	Braintree	BLAN 114	Land east of Great Notley/South of Braintree	247
8	Halstead	HASA 293	Land east of Sudbury Road (The Sleights) adj Churchill Ave, Halstead	243
9	Halstead	HASA 289	Land at Cherry Tree Close, Halstead	241
10	Witham	RIVE 366a	Forest Road, North East Witham, Phase 2a	240
11	Halstead	GGHR 284	Land at Ravens Lane	235
12	Halstead	HASA 295	Land off corner of Fenn Road and Brook Street, Halstead	232
13	Braintree	CRESS 202	Land South of Millennium Way, Braintree	229
14	Braintree	CRESS 199	Land Between Leyfield & Derrygowna, Braintree Road, Tye Green	225
14	Braintree	CRESS 200	Land at 'Leyfield' Braintree Road, Tye Green	225
16	Hatfield Peverel	HATF 317	Land off Gleneagles Way, Hatfield Peverel	221
17	Silver End	SILV 388	Crittal Factory and adjacent site	220
18	Witham	HATF 316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	215
19	Braintree	CRESS 189	Braintree Garden Centre, Cressing Road, Braintree	215
20	Kelvedon	KELV 337	Land at London Road, between Crabb's Lane and Church Street, Kelvedon	214
21	Braintree	CRESS 191	Land on the west side of Mill Lane, Cressing	210
22	Halstead	HATR 306	Land at Oak Road & Tidings Hill, Halstead	209
23	Braintree	BRAW 154	Land south west of Braintree (r/o Gilda Terrace)	209
24	Hatfield Peverel	HATF 321	Land Between Hatfield Peverel & Witham South of A12	208
25	Witham	HATF 315	Land at Woodend Farm, London Road, Witham	207
25	Braintree	CRESS 206	Land North of Tye Green, Braintree	207
27	Braintree	CRESS 205	Land South of A120 East of Railway, Braintree	205
28	Halstead	HASA 513	Central Park, Halstead	201
29	Braintree	CRESS 195	Ivy Cottage, Long Green, Braintree	198
29	Braintree	CRESS 203	Land South of Fowlers Farm Roundabout	198
31	Braintree	CRESS 209	Land South Of Fowlers Farm, Braintree	196
32	Braintree	CRESS 204	Land South of A120, West of Railway, Braintree	187
33	Braintree	GNBN 265	Land North East of Queenborough Lane and south of Flitch Way, Braintree	180
33	Braintree	GNBN 266	Land south west of Braintree (between Flitch Way and A120)	180
35	Braintree	BOCN 137	Towerlands Park, between Panfield Lane and Deanery Hill	179
36	Braintree	BOCN 132	Land bounded by A131, Broad Road and River Blackwater, Braintree	177
37	Kelvedon	FEER 233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	160
38	Marks Tey	FEER 231	Land West of Marks Tey	159
39	Braintree	GRNO 260	Land west of A131 Great Notley	159
40	Kelvedon	FEER 230	Land at Inworth Road, Feering	149
41	Braintree	CRESS 212	Land East of Braintree (Temple Boarder)	111
42	Rayne	GRSA 270	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	79
43	Rayne	GRSA 269	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	70

Level of Existing Sustainable Access	Score
HIGH	300 +
GOOD	200 - 299
LIMITED	100 - 199
LOW	0 - 99

Braintree Local Plan Highway Impact Assessment

SLAA Site Sustainable Accessibility Scores & Ranking: Based on potential accessibility

Rank	Area	Site Ref	Site Description	Weighted Score
1	Braintree	CRESS 212	Land East of Braintree (Temple Boarder)	173
2	Rayne	GRSA 269	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	157
2	Rayne	GRSA 270	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	157
4	Braintree	BLAN 114	Land east of Great Notley/South of Braintree	140
4	Braintree	CRESS 191	Land on the west side of Mill Lane, Cressing	140
4	Braintree	CRESS 204	Land South of A120, West of Railway, Braintree	140
4	Braintree	CRESS 205	Land South of A120 East of Railway, Braintree	140
4	Marks Tey	FEER 231	Land West of Marks Tey	140
9	Braintree	CRESS 203	Land South of Fowlers Farm Roundabout	117
10	Braintree	BOCN 132	Land bounded by A131, Broad Road and River Blackwater, Braintree	112
10	Braintree	BOCN 137	Towerlands Park, between Panfield Lane and Deanery Hill	112
10	Hatfield Peverel	HATF 321	Land Between Hatfield Peverel & Witham South of A12	112
13	Braintree	GRNO 260	Land west of A131 Great Notley	98
14	Braintree	CRESS 200	Land at 'Leyfield' Braintree Road, Tye Green	83
14	Braintree	CRESS 206	Land North of Tye Green, Braintree	83
14	Braintree	CRESS 209	Land South Of Fowlers Farm, Braintree	83
14	Braintree	GNBN 265	Land North East of Queenborough Lane and south of Flitch Way, Braintree	83
14	Witham	WITN 428	Land at Cressing Road, North of Elm Hall Cottages, Witham/Rivenhall	83
19	Halstead	GGHR 284	Land at Ravens Lane	70
20	Braintree	BRAW 154	Land south west of Braintree (r/o Gilda Terrace)	55
20	Braintree	GNBN 266	Land south west of Braintree (between Flitch Way and A120)	55
20	Witham	HATF 315	Land at Woodend Farm, London Road, Witham	55
20	Witham	HATF 316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	55
20	Witham	RIVE 361	Land at The Old Rectory, Rivenhall	55
20	Witham	RIVE 366a	Forest Road, North East Witham, Phase 2a	55
20	Witham	WITN 426	Land to north west of Conrad Road, Witham	55
27	Kelvedon	FEER 233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	42
27	Halstead	HASA 293	Land east of Sudbury Road (The Sleights) adj Churchill Ave, Halstead	42
27	Kelvedon	KELV 337	Land at London Road, between Crabb's Lane and Church Street, Kelvedon	42
30	Braintree	CRESS 202	Land South of Millennium Way, Braintree	40
31	Braintree	BCBG 149	Land around Braintree Tennis/Football Club, Clockhouse Way/Chapel Hill	27
31	Braintree	CRESS 189	Braintree Garden Centre, Cressing Road, Braintree	27
31	Braintree	CRESS 195	Ivy Cottage, Long Green, Braintree	27
31	Braintree	CRESS 199	Land Between Leyfield & Derrygowna, Braintree Road, Tye Green	27
31	Hatfield Peverel	HATF 317	Land off Gleneagles Way, Hatfield Peverel	27
31	Witham	RIVE 366b	Forest Road, North East Witham, Phase 2b	27
31	Witham	WITN 427	Land North of Conrad Road (redundant allotments), Witham	27
38	Kelvedon	FEER 230	Land at Inworth Road, Feering	13
38	Halstead	HASA 289	Land at Cherry Tree Close, Halstead	13
38	Halstead	HASA 295	Land off corner of Fenn Road and Brook Street, Halstead	13
38	Halstead	HASA 513	Central Park, Halstead	13
38	Halstead	HATR 306	Land at Oak Road & Tidings Hill, Halstead	13
43	Silver End	SILV 388	Crittal Factory and adjacent site	0

Level of Potential Sustainable Access	Score
HIGH	100 +
GOOD	50 - 99
LIMITED	25 - 49
LOW	0 - 24

Braintree Local Plan Highway Impact Assessment

LP Site Sustainable Accessibility Scores & Ranking: Based on existing and potential accessibility

Rank	Area	Site Ref	Site Description	Weighted Score
1	Braintree	BLAN 114	Land east of Great Notley/South of Braintree	387
2	Braintree	CRESS 191	Land on the west side of Mill Lane, Cressing	350
3	Braintree	CRESS 205	Land South of A120 East of Railway, Braintree	345
4	Witham	WITN 428	Land at Cressing Road, North of Elm Hall Cottages, Witham/Rivenhall	344
5	Witham	RIVE 361	Land at The Old Rectory, Rivenhall	340
6	Braintree	CRESS 204	Land South of A120, West of Railway, Braintree	327
7	Witham	WITN 426	Land to north west of Conrad Road, Witham	325
8	Hatfield Peverel	HATF 321	Land Between Hatfield Peverel & Witham South of A12	319
9	Braintree	CRESS 203	Land South of Fowlers Farm Roundabout	314
10	Braintree	CRESS 200	Land at 'Leyfield' Braintree Road, Tye Green	309
11	Halstead	GGHR 284	Land at Ravens Lane	305
12	Braintree	BCBG 149	Land around Braintree Tennis/Football Club, Clockhouse Way/Chapel Hill	304
13	Witham	RIVE 366b	Forest Road, North East Witham, Phase 2b	301
14	Marks Tey	FEER 231	Land West of Marks Tey	299
15	Witham	WITN 427	Land North of Conrad Road (redundant allotments), Witham	297
16	Witham	RIVE 366a	Forest Road, North East Witham, Phase 2a	295
17	Braintree	BOCN 137	Towerlands Park, between Panfield Lane and Deanery Hill	291
18	Braintree	CRESS 206	Land North of Tye Green, Braintree	290
19	Braintree	BOCN 132	Land bounded by A131, Broad Road and River Blackwater, Braintree	288
20	Halstead	HASA 293	Land east of Sudbury Road (The Sleights) adj Churchill Ave, Halstead	284
21	Braintree	CRESS 212	Land East of Braintree (Temple Boarder)	284
22	Braintree	CRESS 209	Land South Of Fowlers Farm, Braintree	279
23	Witham	HATF 316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	270
24	Braintree	CRESS 202	Land South of Millennium Way, Braintree	269
25	Braintree	BRAW 154	Land south west of Braintree (r/o Gilda Terrace)	264
26	Braintree	GNBN 265	Land North East of Queenborough Lane and south of Flitch Way, Braintree	263
27	Witham	HATF 315	Land at Woodend Farm, London Road, Witham	262
28	Braintree	GRNO 260	Land west of A131 Great Notley	258
29	Kelvedon	KELV 337	Land at London Road, between Crabb's Lane and Church Street, Kelvedon	256
30	Halstead	HASA 289	Land at Cherry Tree Close, Halstead	254
31	Braintree	CRESS 199	Land Between Leyfield & Derrygowna, Braintree Road, Tye Green	252
32	Hatfield Peverel	HATF 317	Land off Gleneagles Way, Hatfield Peverel	248
33	Halstead	HASA 295	Land off corner of Fenn Road and Brook Street, Halstead	245
34	Braintree	CRESS 189	Braintree Garden Centre, Cressing Road, Braintree	242
35	Rayne	GRSA 270	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	236
36	Braintree	GNBN 266	Land south west of Braintree (between Flitch Way and A120)	235
37	Rayne	GRSA 269	Land centred on Saling Airfield between Stebbing and Rayne, Braintree	227
38	Braintree	CRESS 195	Ivy Cottage, Long Green, Braintree	224
39	Halstead	HATR 306	Land at Oak Road & Tidings Hill, Halstead	222
40	Silver End	SILV 388	Crittal Factory and adjacent site	220
41	Halstead	HASA 513	Central Park, Halstead	214
42	Kelvedon	FEER 233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	202
43	Kelvedon	FEER 230	Land at Inworth Road, Feering	163

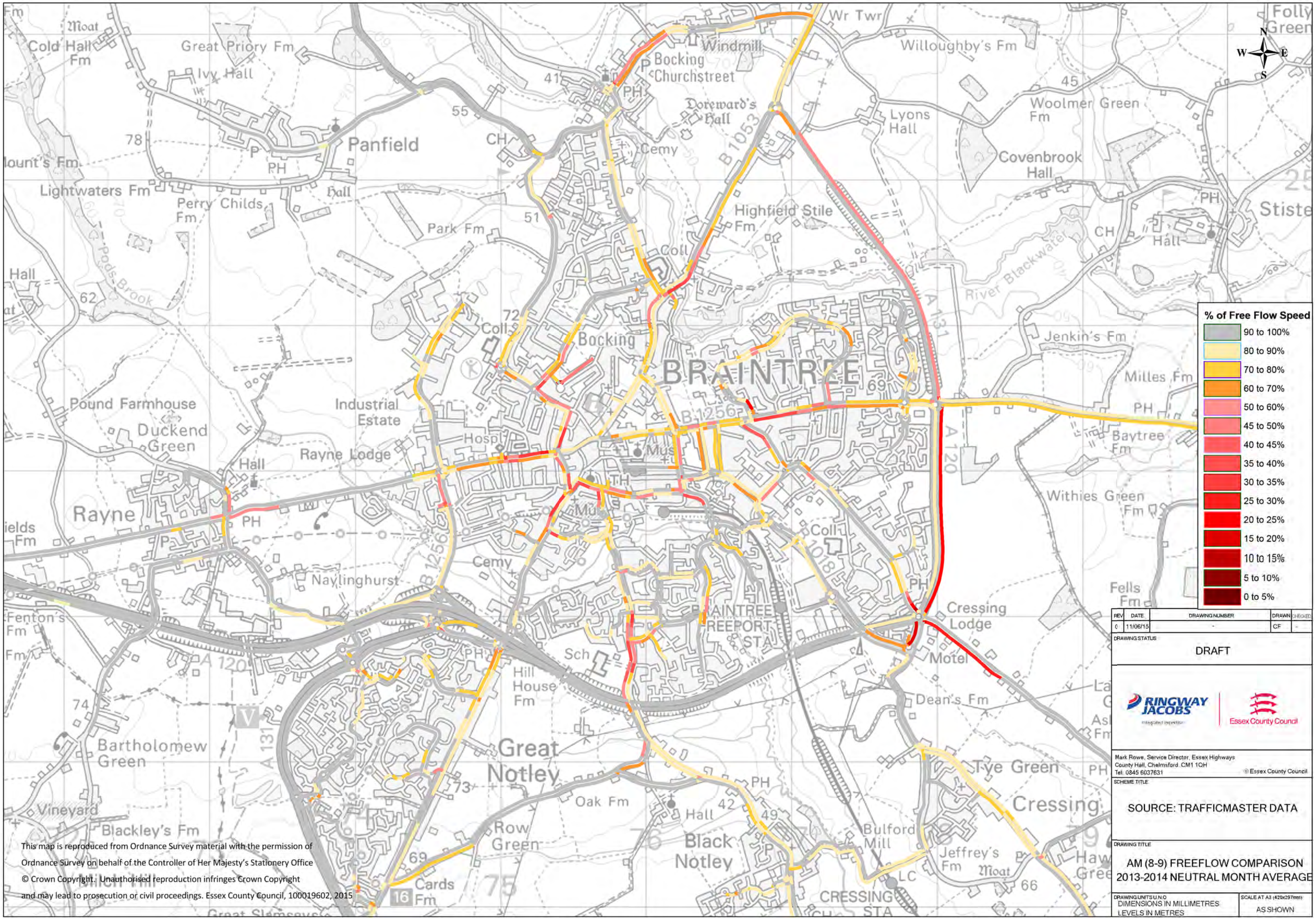
Level of Sustainable Access	Score
HIGH	350 +
GOOD	250 - 349
LIMITED	150 - 249
LOW	0 - 149

Appendix C:
Developments in each Strategy Option

Appendix C - Scenario List

Site Ref	Scenarios Inclduded In
BCBG 149	1,4,5,6,10,11
BLAN 114	1,3,4,10,11
BOCN 132	1,4,6,10,11
BOCN 137	1,6,11
BRAW 154	1,2,4,5,6,7,10
GNBN 266	1,2,4,5,6,7,10
CRESS 189	4,6,10,11
CRESS 191	3,4,6,10,11
CRESS 195	4,6,10,11
CRESS 199	4,6,10,11
CRESS 200	3,4,6,10,11
CRESS 202	3,4,6,10,11
CRESS 203	3,4,6,10,11
CRESS 204	3,4,6,10,11
CRESS 205	3,4,6,10,11
CRESS 206	3,4,6,10,11
CRESS 209	3,4,6,10,11
CRESS 212	2,6,9,11
FEER 230	5,7,8
FEER 231	2,3,5,7,8,9
FEER 233	1,5,8,9
GGHR 282	1,2,3,4,5,7,8
GGHR 284	5,7,8
GGHR 307	All
GNBN 264	All
GNBN 265	4,5,6,10,11
GRNO 260 Option 1	1,8,9,10,11
GRNO 260 Option 2	5,6,7
GRSA 269	2,8,9
GRSA 270	2,8,9
HASA 288	3,4,5,7
HASA 289	1,4,5,7,8,10
HASA 293	1,5,7,8,10
HASA 295	1,4,5,7,8,10
HASA 513	1,4,5,7,8,10
HATF 315	1,5,7
HATF 316	5,7
HATF 317	5,7,8
HATF 321	1,3,4,5,7,8,9
HATR 306	4,5,7,8
KELV 337	1,5,6,7,8
LIST 339	1,5,7,8
PANF 136	1,2,3,4,5,6,7,8,11
PANF Core Strategy	All
RIVE 360	All
RIVE 361	1,4,5,7,10
RIVE 366a	1,5,7
RIVE 366b	1,5,7
SILV 388	1,6,7,8,11
SILV 389	1,7,8,11
WITN 426	1,3,5,7
WITN 427	3,5,7
WITN 428	3,4,7,10
WITC 423	All
WIS9E	All

Appendix D:
Trafficmaster Congestion Plots



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated experts

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

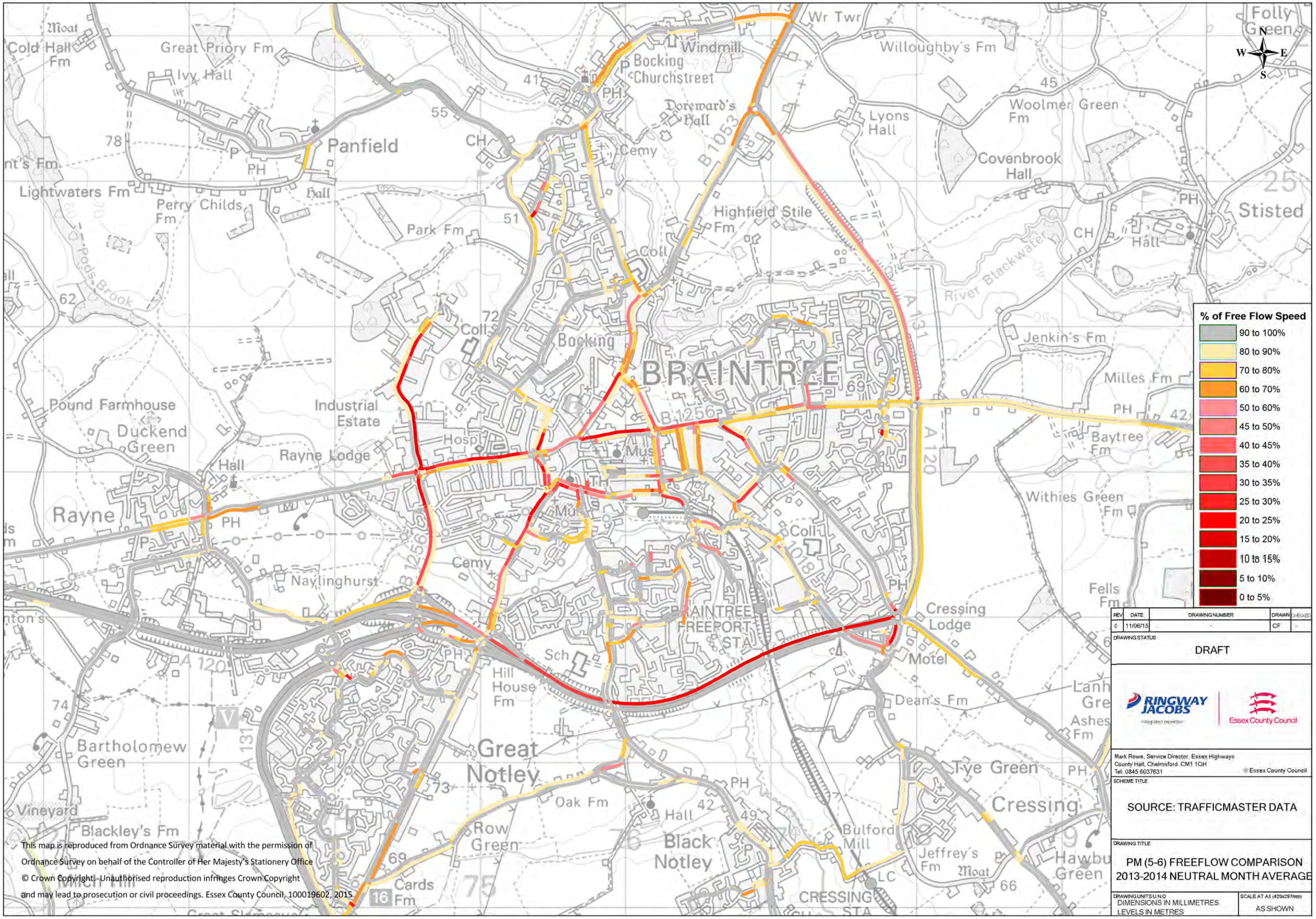
SCHEME TITLE

SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

AM (8-9) FREEFLOW COMPARISON 2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O	SCALE AT A3 (420x297mm)
DIMENSIONS IN MILLIMETRES LEVELS IN METRES	AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

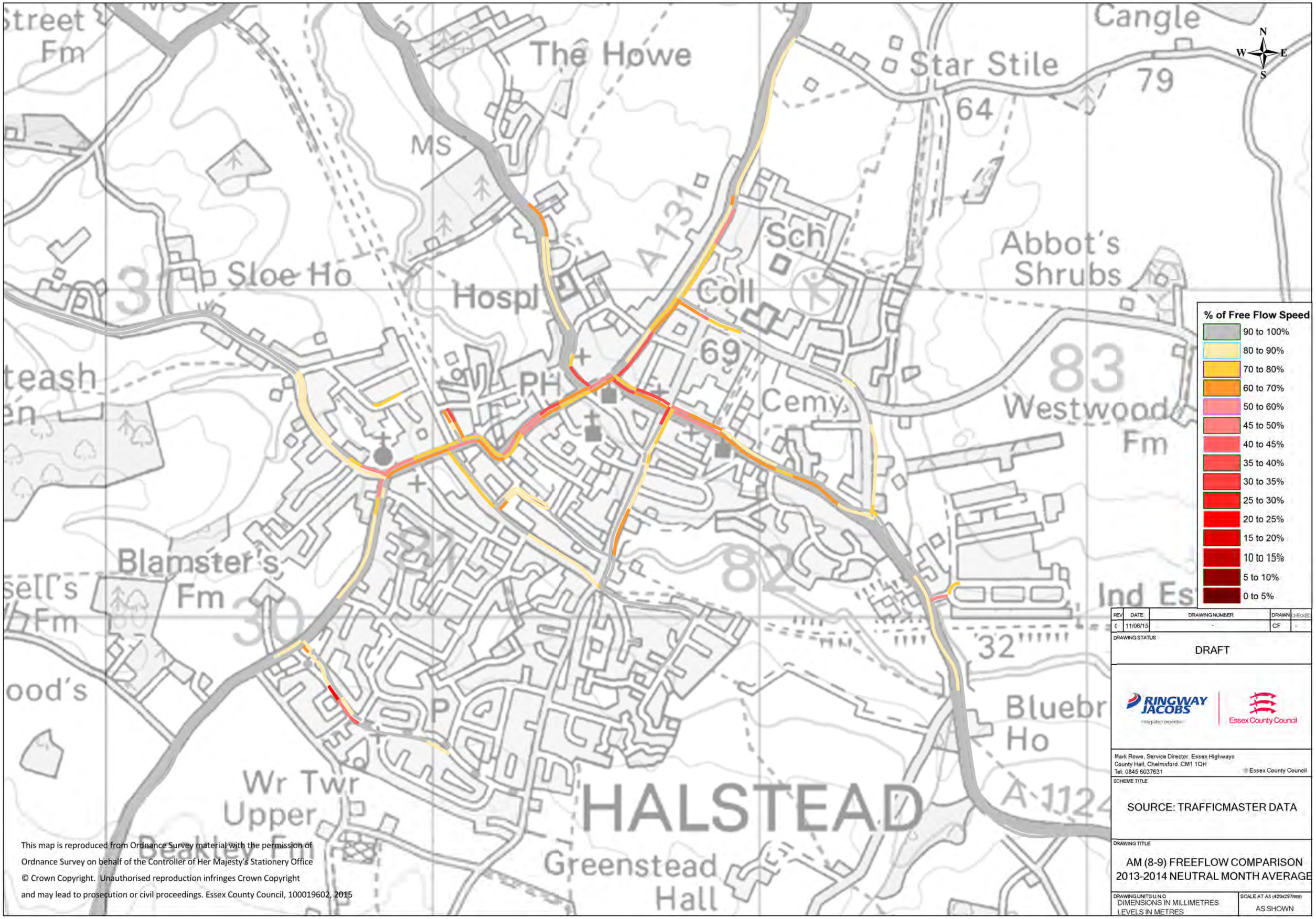
SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

PM (5-6) FREEFLOW COMPARISON 2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

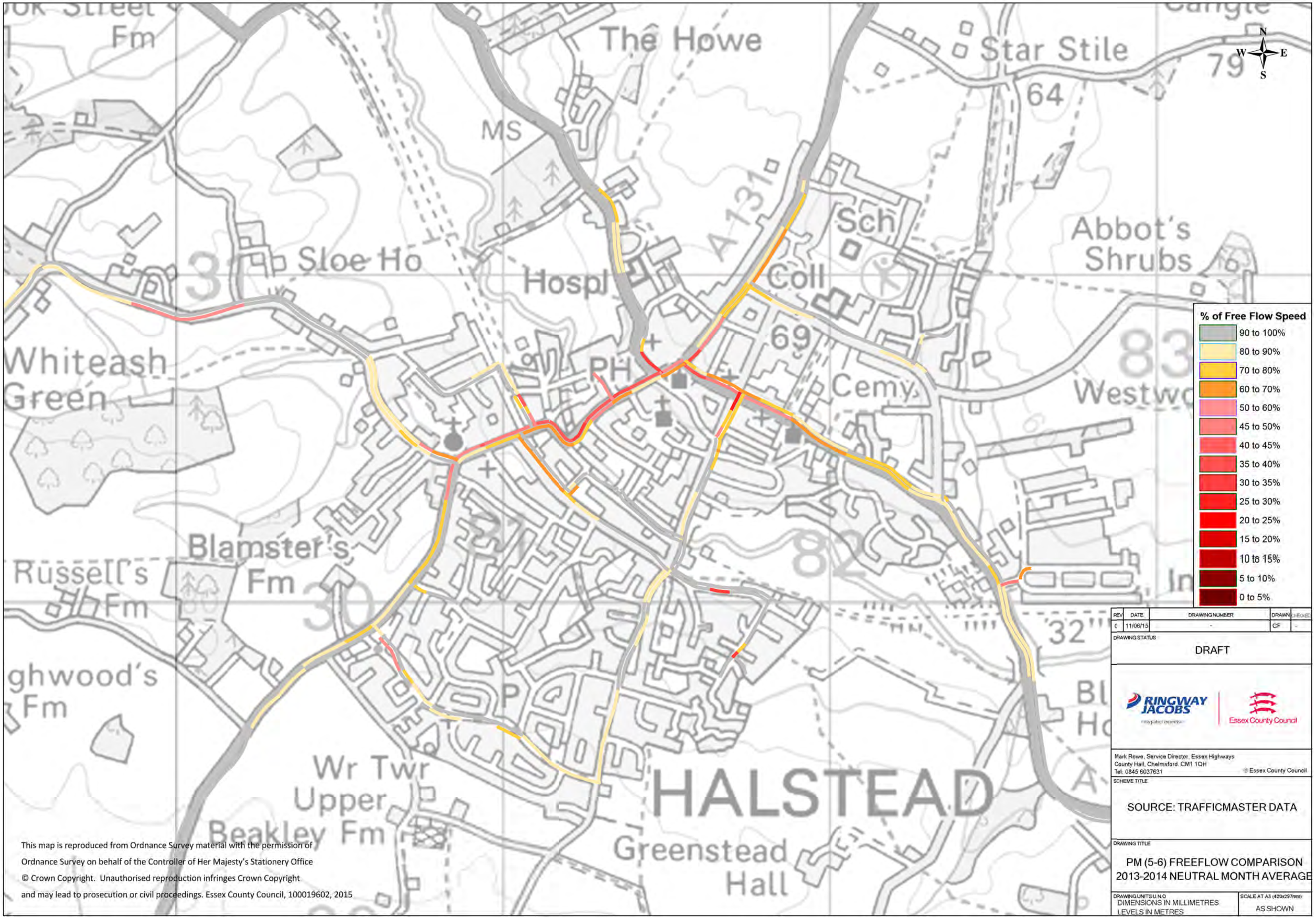
SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

AM (8-9) FREEFLOW COMPARISON 2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

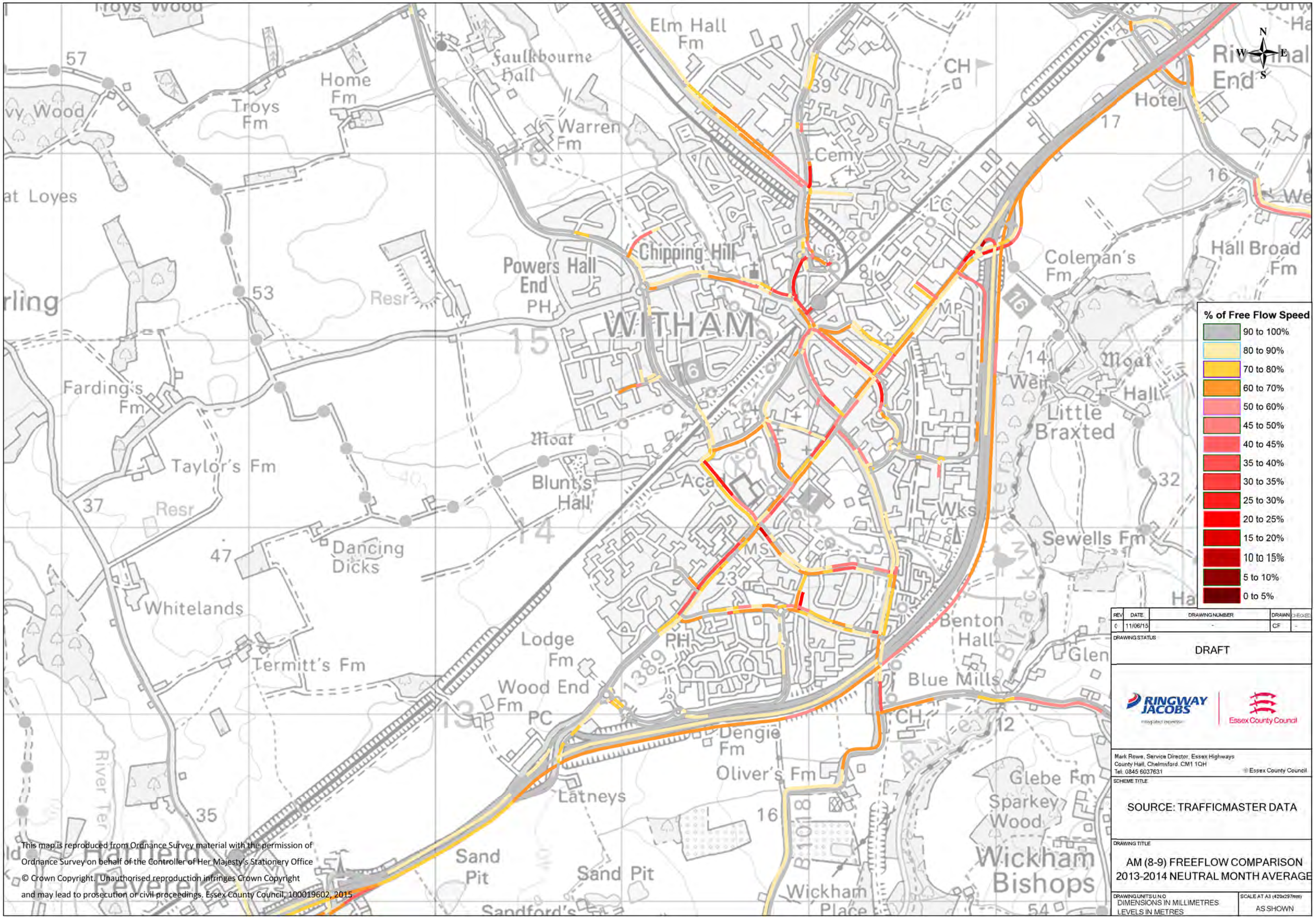
SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

PM (5-6) FREEFLOW COMPARISON
2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

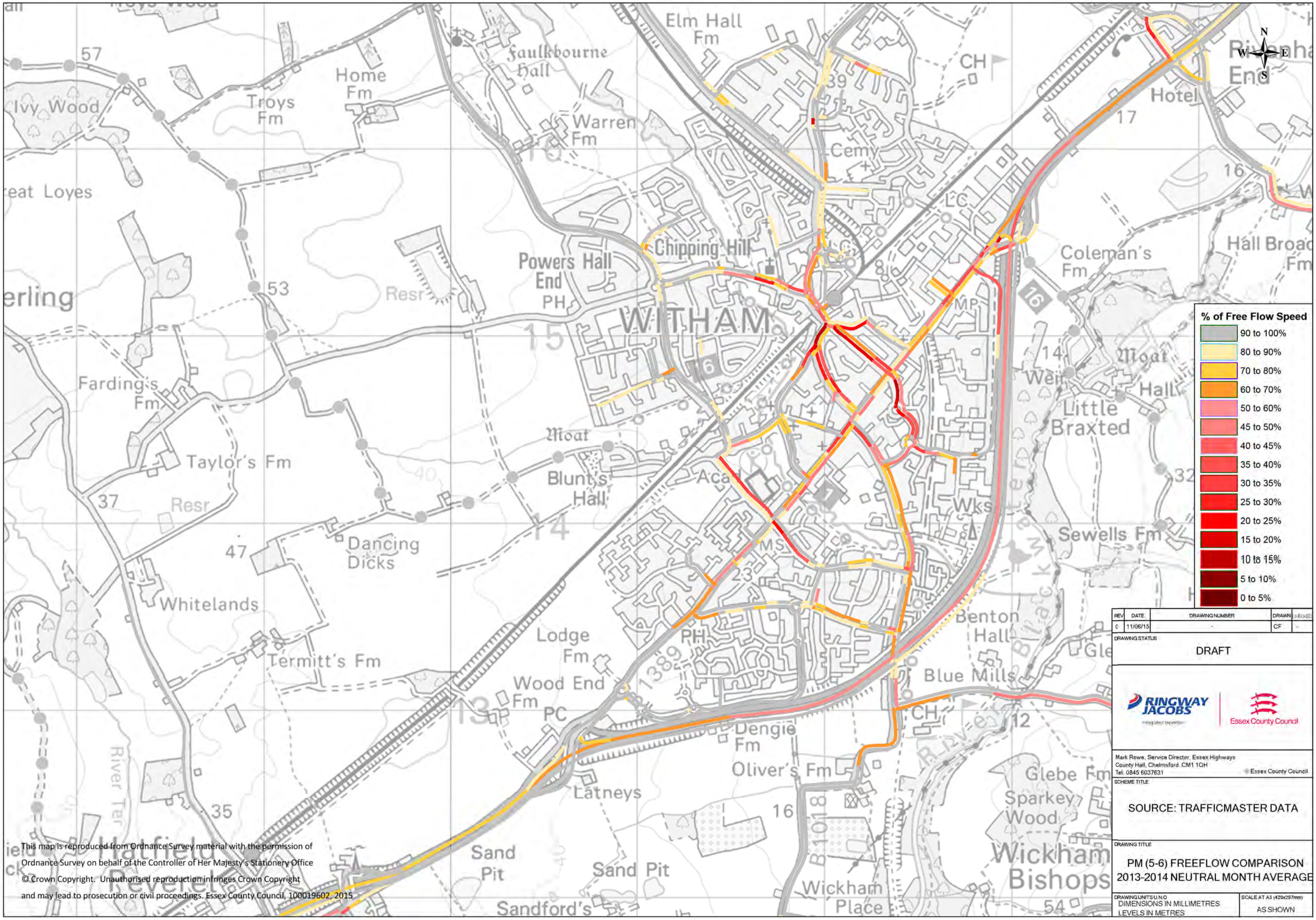
SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

AM (8-9) FREEFLOW COMPARISON
2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	11/06/15	-	CF	-

DRAWING STATUS

DRAFT

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

SOURCE: TRAFFICMASTER DATA

DRAWING TITLE

PM (5-6) FREEFLOW COMPARISON
2013-2014 NEUTRAL MONTH AVERAGE

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN

Appendix E:
Scenario Maps

HASA 293
HASA 289
HASA 295
HASA 513
GGHR 282
GGHR 307
GGHR 284
BOCN 137
BOCN 132
PANF CS
BRAW 154
BCBG149
GNBN264
BLAN 114
GRNO 260
SILV389
SILV388
FEER 233
KELV 337
Kelv 338
RIVE 366b
RIVE 366a
WITN 426
RIVE 361
RIVE 360
WITC 423
HATF 315
WIS9E
HATF 321

N
W
E
S

Legend

- Committed Site
- Residential Site
- Employment Site
- Mixed Site
- Country Park
- District Boundary

REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
3	30/11/15	B3553R0D43TP005	CF	TK

DRAWING STATUS

FINAL

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

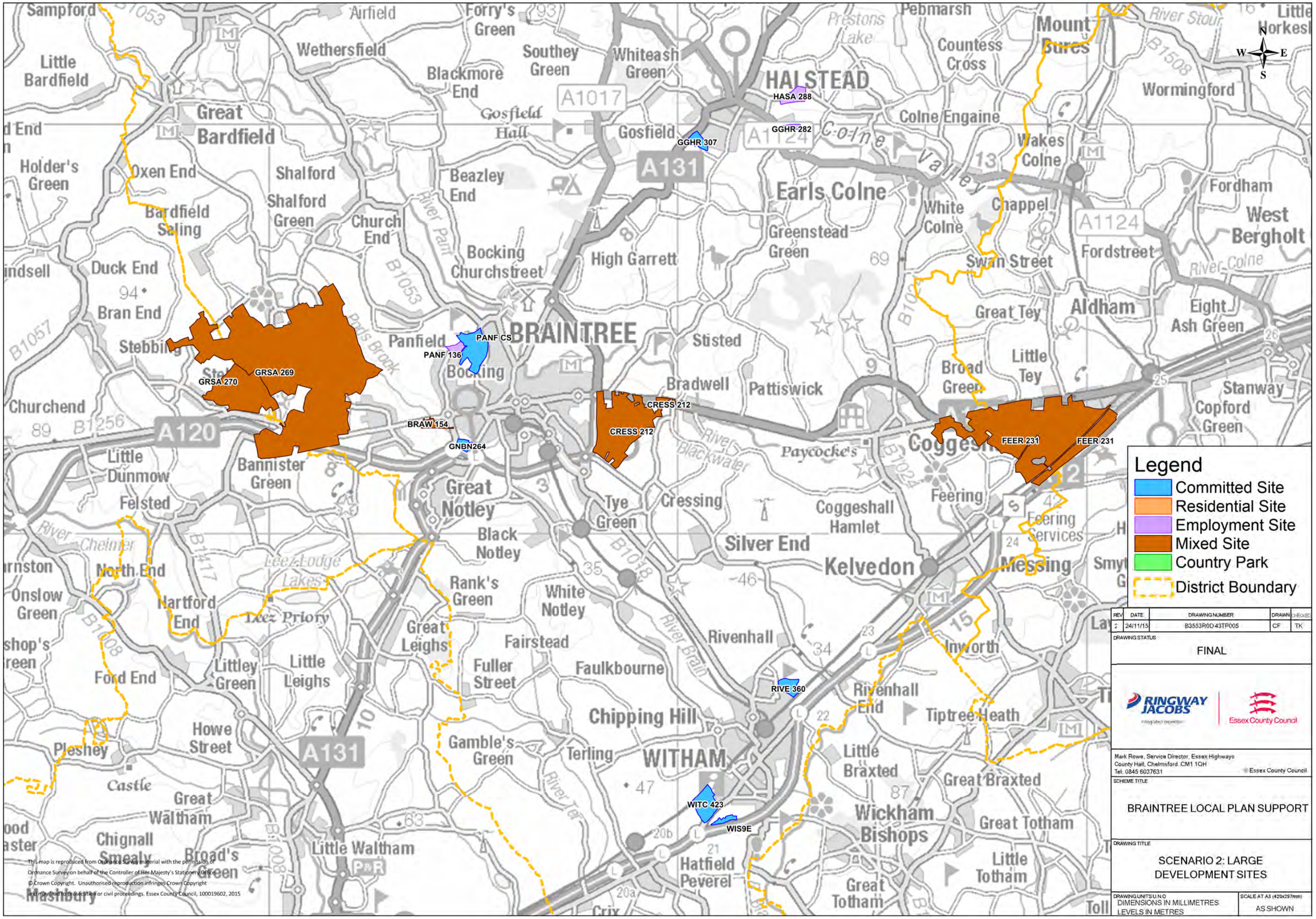
BRAINTREE LOCAL PLAN SUPPORT

DRAWING TITLE

SCENARIO 1: EXCLUDING LARGE DEVELOPMENT SITES

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
2	24/11/15	B3553R0D43TP005	CF	TK

DRAWING STATUS

FINAL

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford .CM1 1QH
Tel. 0845 6037631

SCHEME TITLE

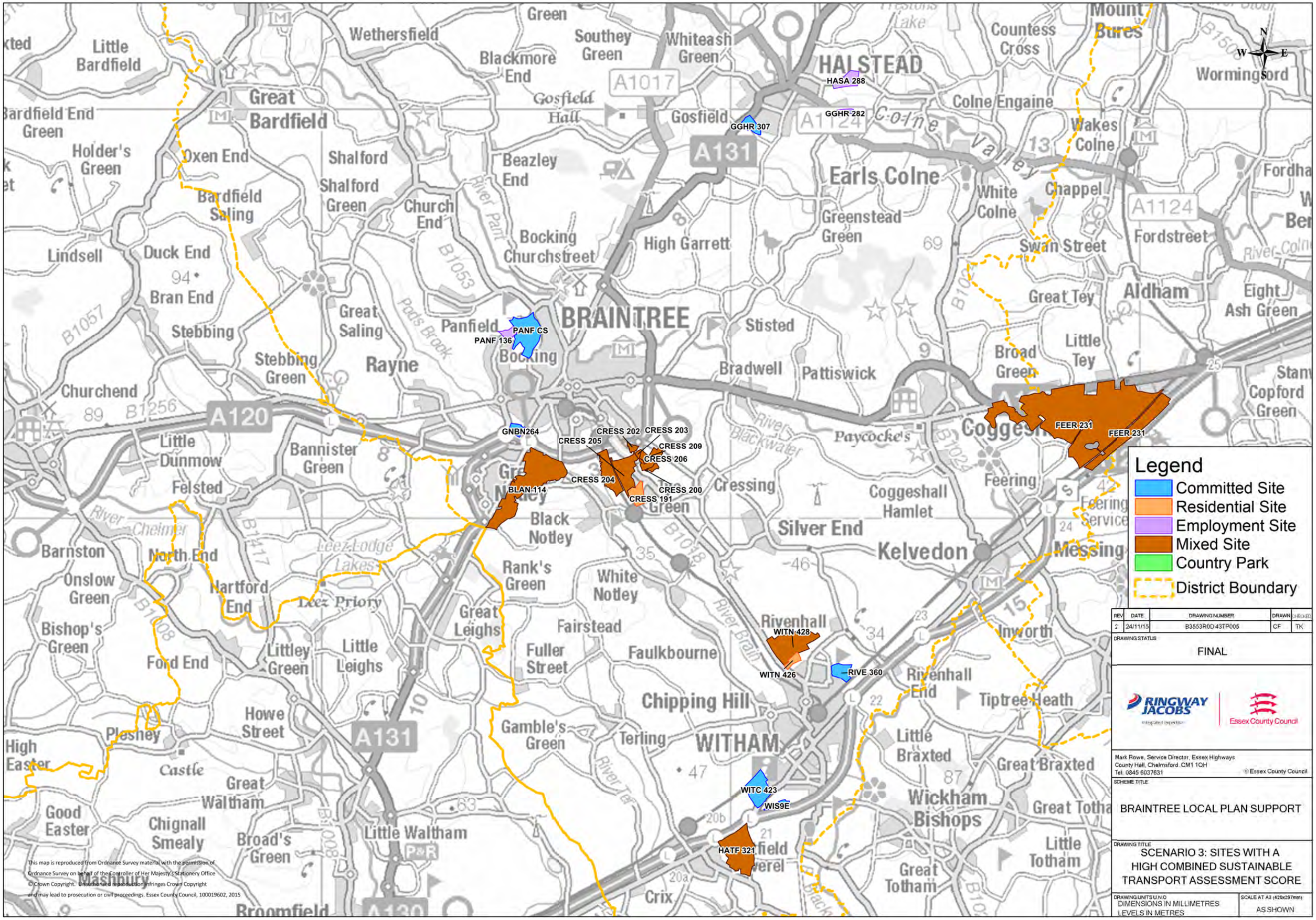
BRAINTREE LOCAL PLAN SUPPORT

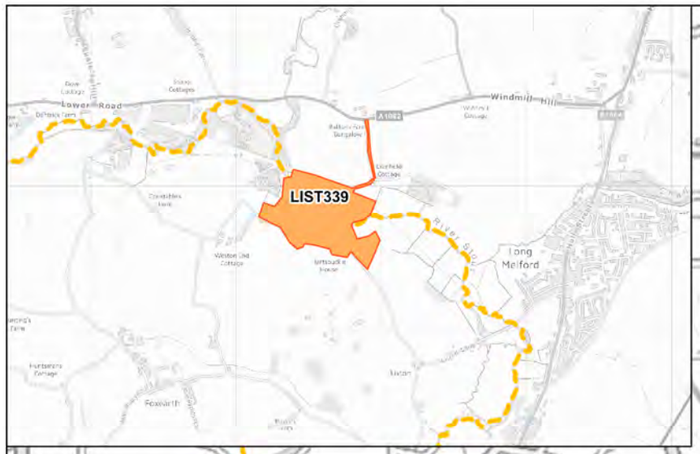
DRAWING TITLE

SCENARIO 2: LARGE DEVELOPMENT SITES

DRAWING UNITS U.N.O.
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN


HASA 288
GGHR 282
GGHR 307
PANF CS
PANF 136
GNBN264
CRESS 202
CRESS 203
CRESS 205
CRESS 209
CRESS 206
CRESS 204
CRESS 200
CRESS 191
BLAN 114
WITN 428
WITN 426
RIVE 360
WITC 423
WIS9E
HATF 321
FEER 231
FEER 231
Legend
Committed Site
Residential Site
Employment Site
Mixed Site
Country Park
District Boundary
REV
DATE
DRAWING NUMBER
DRAWN
CHECKED
24/11/15
B3553R0D43TP005
CF
TK
DRAWING STATUS
FINAL
RINGWAY JACOBS
integrated expertise
Essex County Council
Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631
© Essex County Council
SCHEME TITLE
BRAINTREE LOCAL PLAN SUPPORT
DRAWING TITLE
SCENARIO 3: SITES WITH A HIGH COMBINED SUSTAINABLE TRANSPORT ASSESSMENT SCORE
DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES
SCALE AT A3 (420x297mm)
AS SHOWN
This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Essex County Council, 100019602, 2015



HASA 293
HASA 289
HASA 295
HASA 513
GGHR 307
GGHR 284
GGHR 282
HATR 306
GRSA 269
GRSA 270
PANF CS
GNBN264
GRNO 260
SILV389
SILV388
FEER 231
FEER 231
FEER 230
WITN 426
RIVE 361
RIVE 360
WITC 423
WIS9E
HATF 321
HATF 317

Legend

- Committed Site
- Residential Site
- Mixed Site
- Employment Site
- District Boundary

REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
3	30/11/15	B3553R0D43TP005	CF	TK

DRAWING STATUS: FINAL

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE: BRAINTREE LOCAL PLAN SUPPORT

DRAWING TITLE: SCENARIO 8: SPREAD/RURAL SITES

DRAWING UNITS U.N.O: DIMENSIONS IN MILLIMETRES, LEVELS IN METRES

SCALE AT A3 (420x297mm): AS SHOWN

GGHR 307
BOCN 137
PANF CS
GRSA 269
GRSA 270
CRESS 212
CRESS 212
FEER 231
FEER 231
GNBN264
GRNO 260
RIVE 360
WITC 423
WIS9E
FEER 230

Legend

- Committed Site
- Residential Site
- Employment Site
- Mixed Site
- Country Park
- District Boundary

REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
3	30/11/15	B3553R0D43TP005	CF	TK

DRAWING STATUS

FINAL

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

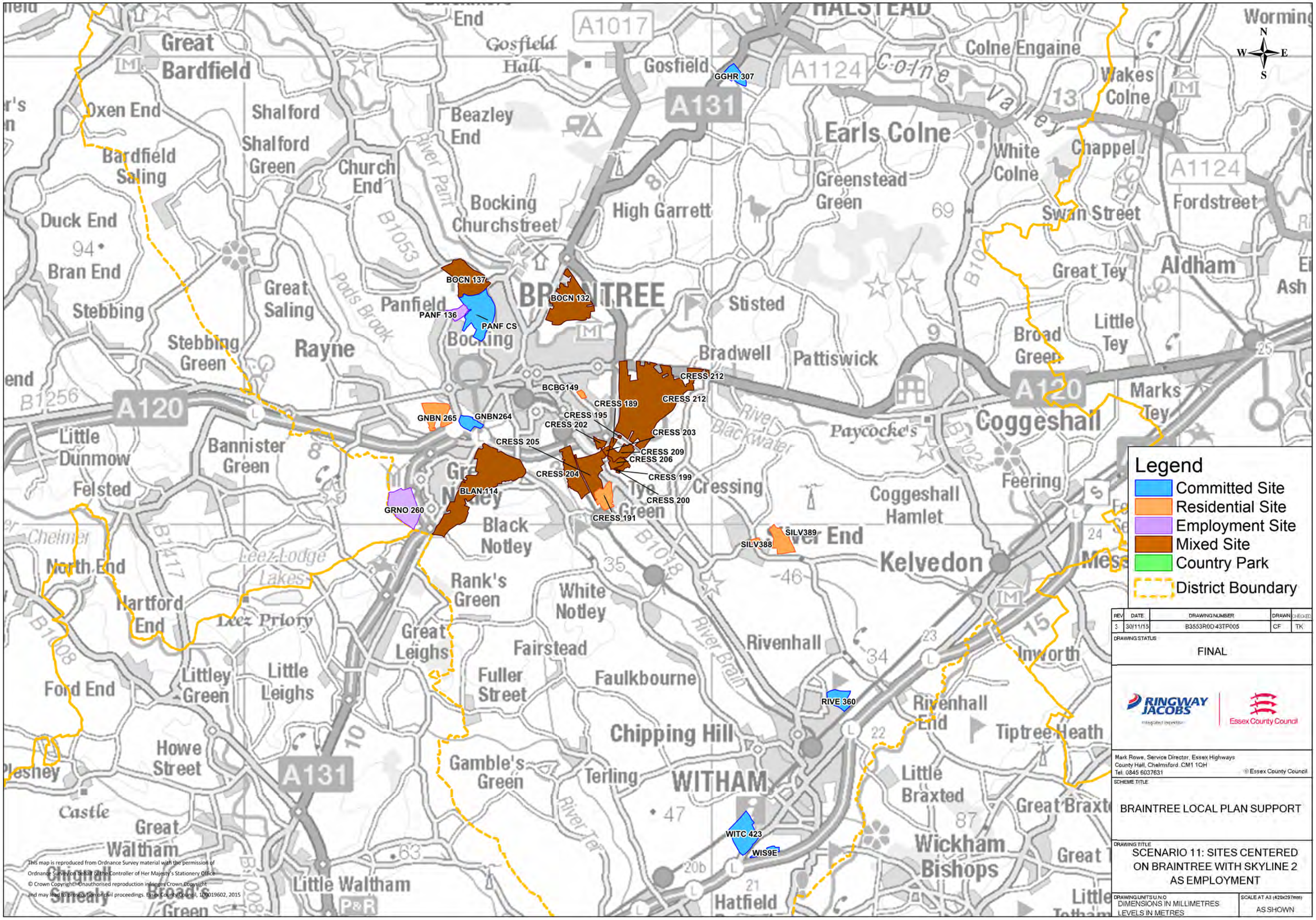
BRAINTREE LOCAL PLAN SUPPORT

DRAWING TITLE

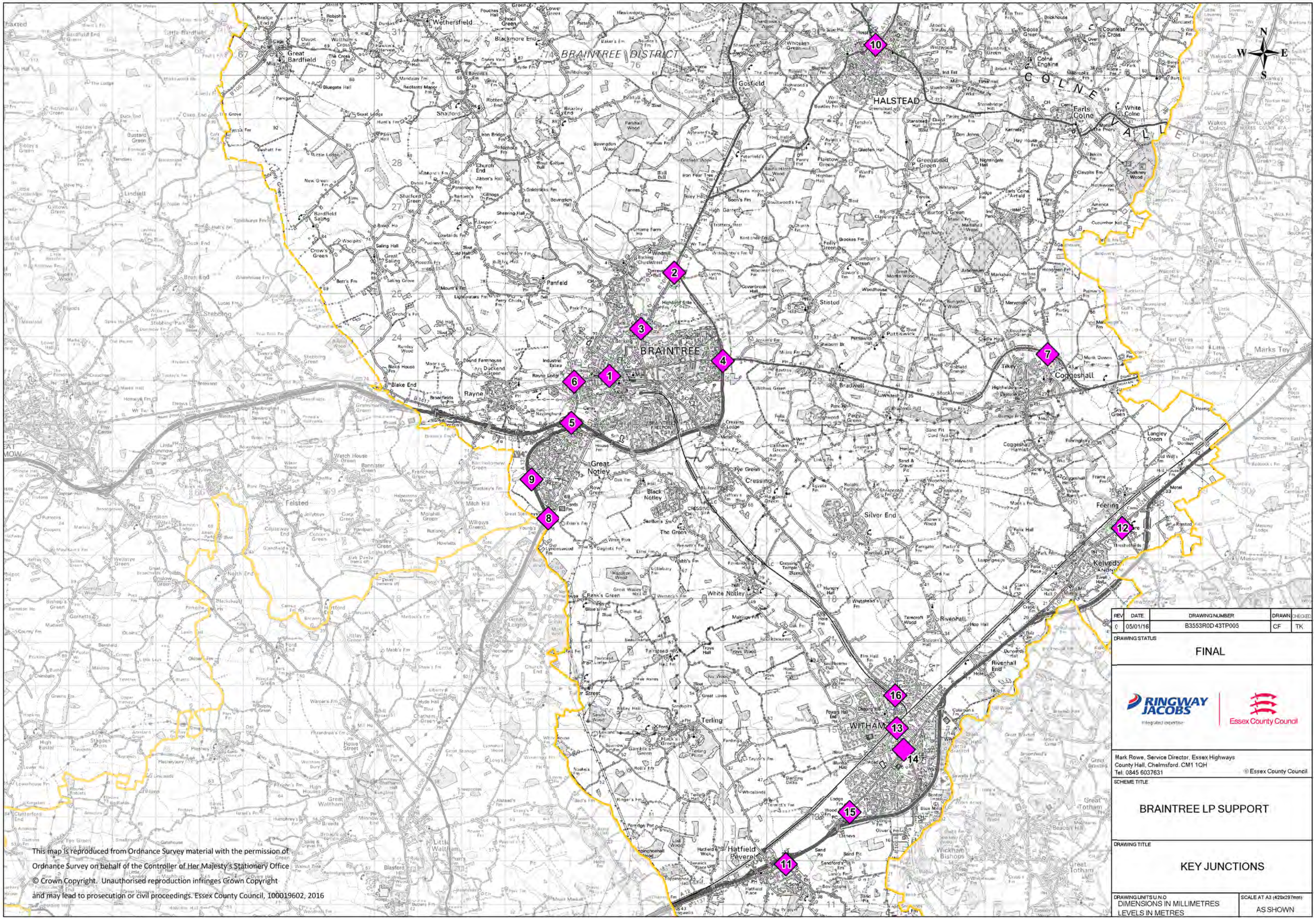
SCENARIO 9: LARGE DVELOPMENT SITES WITH SKYLINE 2 AS EMPLOYMENT

DRAWING UNITS U.N.O
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN



Appendix F: Key Junctions



REV	DATE	DRAWING NUMBER	DRAWN	CHECKED
0	05/01/16	B3553R0D43TP005	CF	TK

DRAWING STATUS

FINAL

RINGWAY JACOBS integrated expertise

Essex County Council

Mark Rowe, Service Director, Essex Highways
County Hall, Chelmsford. CM1 1QH
Tel: 0845 6037631

SCHEME TITLE

BRAINTREE LP SUPPORT

DRAWING TITLE

KEY JUNCTIONS

DRAWING UNITS U.N.O.
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297mm)
AS SHOWN

Appendix G:
Panfield Link

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

LEGEND

← INDICATIVE ACCESS

REV.	DETAILS	DRAWN	CHECKED	DATE
L	Viewport adjusted	HF	PW	21.09.15
K	Proposed footway included	HF	PW	16.09.15
J	Footpath stub removed from access off Panfield Lane.	HS	AS	03.08.15
I	Most north-western access added.	HS	AS	03.08.15
H	Turning area amendments, Adjusted crossing area facilities.	PJ	HS	27.07.15
G	Turning area amendments.	HS	AS	29.06.15
F	Turning area off Springwood Drive removed.	HS	AS	09.06.15
E	Springwood Drive alignment amended.	HS	AS	01.06.15
D	Layout Amendments.	HS	AS	11.03.15
C	Layout Amendments.	HS	AS	05.03.15
B	Layout Amendments.	HF	AS	28.07.14
A	Accesses relocated.	HF	AS	24.07.14

CLIENT:

Mersea Homes Ltd &
Hills Residential Ltd

PROJECT:

Braintree

DRAWING TITLE:

General Arrangement

SCALES:

1:1250 at A1

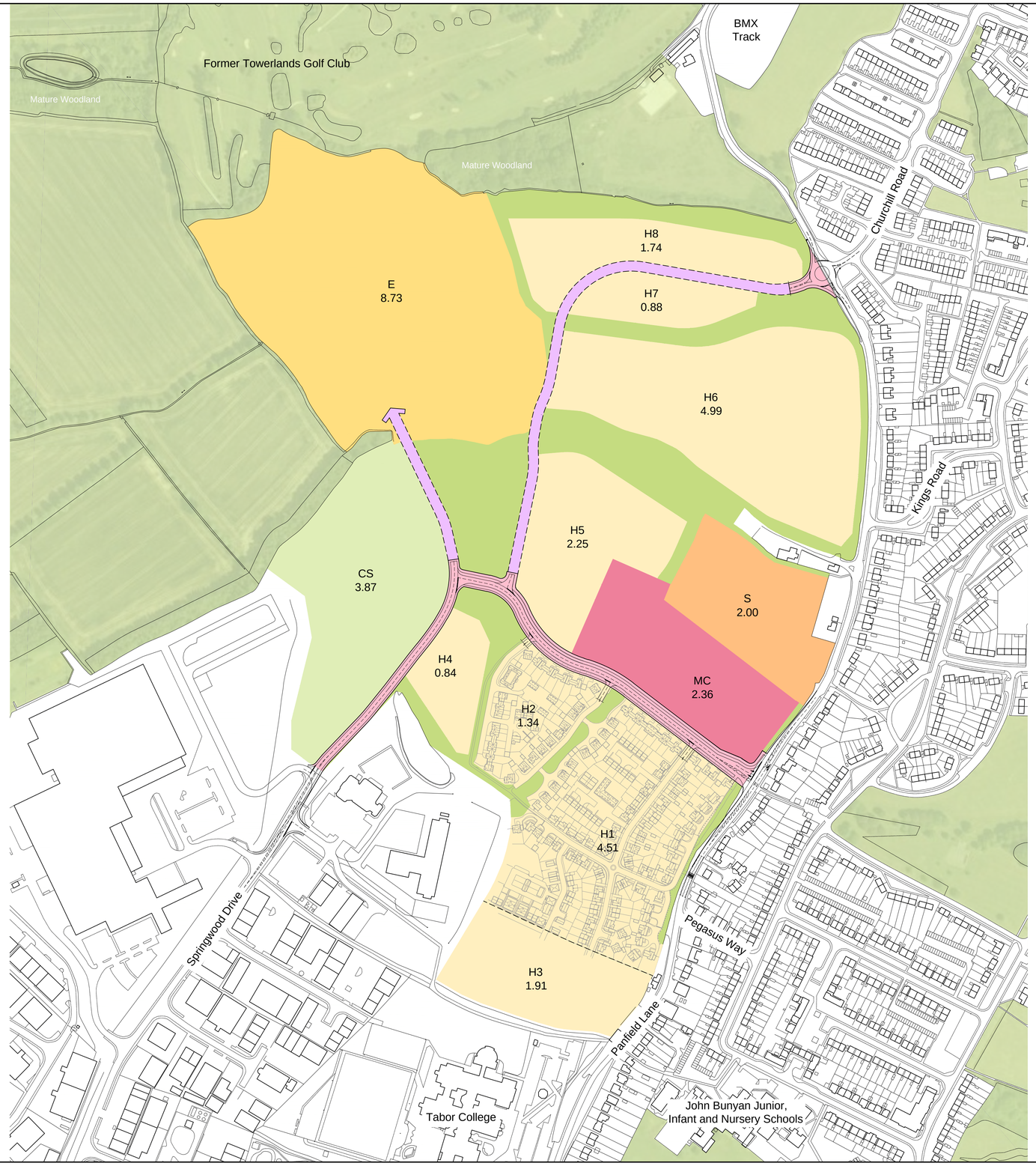
DRAWN: HS | CHECKED: AS | DATE: 21.07.14

vectos
transport planning specialists

3rd Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: VN30215-200

REVISION: L



N

Scale 1:2500 @ A1 / 1:5000 @ A3

0 50 100 150 200 250m

E	Employment	8.73ha
MC	Mixed Use Centre	2.36ha
H	Residential	18.46ha
GI	GI	5.88ha
S	School Land	2.00ha
CS	Community Sports Land	3.87ha

* In each case, the land use zones indicated may also include land for access, parking and servicing in connection with that part of the development, land for surface water drainage, other infrastructure required in connection with that part of the development, and incidental green space / open space uses (including play space in respect of residential and green infrastructure areas).

Spine Road

Phase 1 1.15ha

Future Phases(s) (Indicative Alignment)

Notes

All dimensions to be verified on site. Do not scale from this drawing.

Mersea Homes Ltd. and Hills Residential Ltd., Panfield Lane, Braintree

LAND USE PLAN - AREA SCHEDULE

1:2500 @ A1

24 September 2015

4957-L-25 rev M

masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby DE74 2RH

t: 01509 672772
f: 01509 674565
e: mail@fpcr.co.uk
w: www.fpcr.co.uk

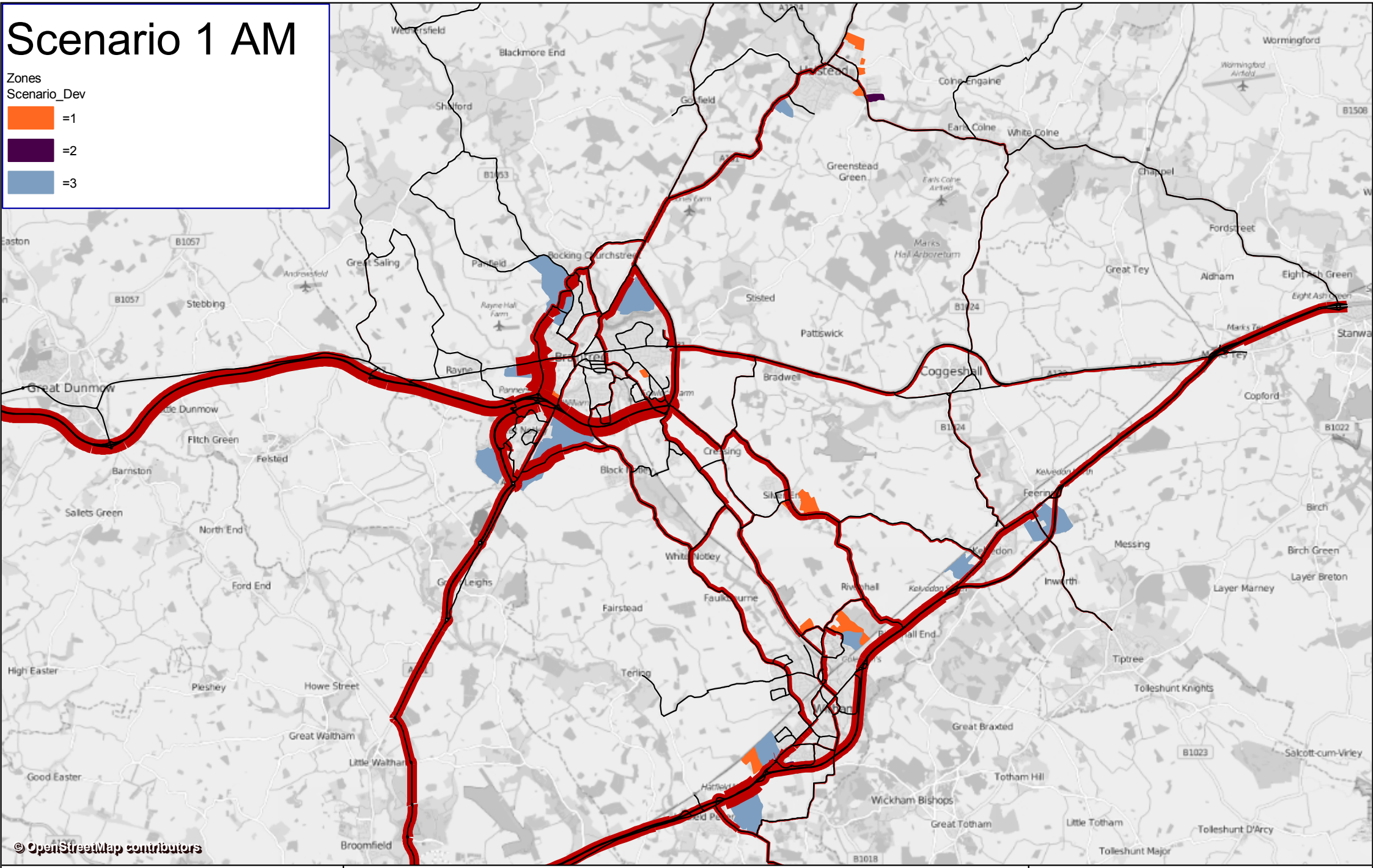
drawn JMG CAD file J:\4900\4957\LANDS\4957-L-25 rev - - Land Use Parameters Plan.dwg

Appendix H:
Background Growth Results

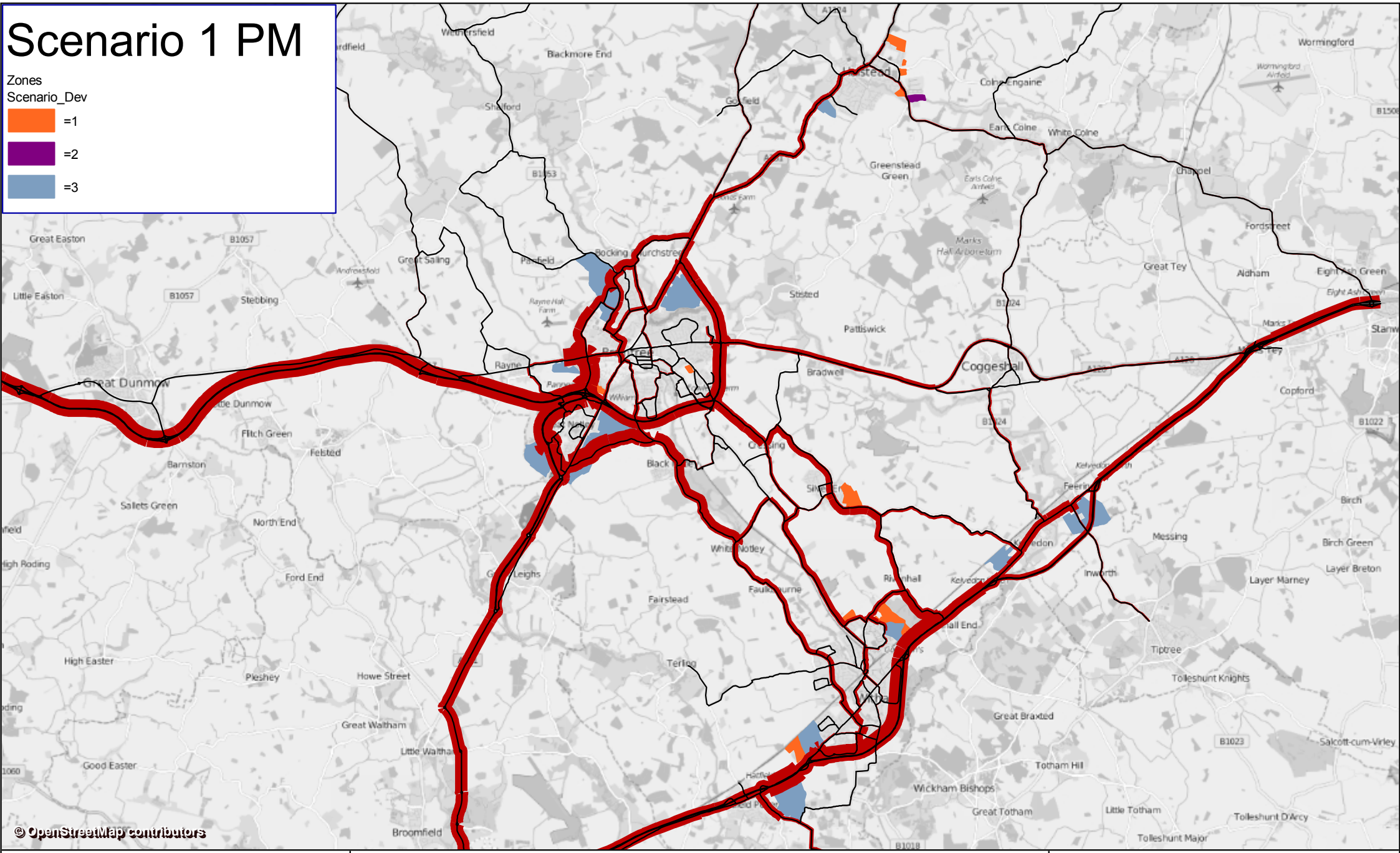
Appendix H - Background Growth

Junction Name	Junction Arm	Tempro Zone	Urban/ Rural	Road Type	2015 AM Base flow	2015 PM Base flow	Traffic Growth Factor AM	Traffic Growth Factor PM	2033 AM Base Flows	2033 PM Base Flows
A131 Eastern Halstead	A131 Head Street	22UC3	Urban	Principal	525	421	1.107883	1.122072	582	472
	A1124 Colchester Road	22UC3	Urban	Principal	501	554	1.107883	1.122072	555	622
	HE Link	22UC3	Urban	Principal	754	1001	1.107883	1.122072	835	1123
A131 Western Halstead	HW Link	22UC3	Urban	Principal	844	779	1.107883	1.122072	935	874
	Parsonage Street	22UC3	Urban	Minor	61	42	1.114909	1.129187	68	47
	A131 High Street	22UC3	Urban	Principal	631	818	1.107883	1.122072	699	918
	A1124 Hedingham Road	22UC3	Urban	Principal	261	365	1.107883	1.122072	289	410
A120 Coggeshall	B1024 Colne Road	22UC5	Rural	Minor	339	318	1.127514	1.141366	382	363
	CR A120 E	22UC5	Rural	Trunk	1123	889	1.151125	1.165267	1293	1036
	Colne Road	22UC5	Rural	Minor	204	201	1.127514	1.141366	230	229
	CR A120 W	22UC5	Rural	Trunk	916	1062	1.151125	1.165267	1054	1238
Rye Mill Lane Kelvedon	Rye Mill Lane	22UC4	Rural	Minor	38	17	1.120752	1.131692	42	19
	B1024 London Road	22UC4	Rural	Minor	667	577	1.120752	1.131692	748	653
	B1023	22UC4	Rural	Minor	448	470	1.120752	1.131692	502	532
	B1024	22UC4	Rural	Minor	487	441	1.120752	1.131692	545	499
Rickstones Road Northern Witham	RN Rickstones Road	22UC2	Urban	Minor	297	273	1.120413	1.135018	333	310
	RN Link	22UC2	Urban	Minor	767	976	1.120413	1.135018	859	1108
	RN Cressing Road	22UC2	Urban	Minor	725	509	1.120413	1.135018	812	578
Rickstones Road Southern Witham	RS Link	22UC2	Urban	Minor	1008	764	1.120413	1.135018	1129	867
	RS Cypress Road	22UC2	Urban	Minor	167	119	1.120413	1.135018	187	135
	RS B1018	22UC2	Urban	Minor	798	1096	1.120413	1.135018	894	1244
Chipping Hill Witham	Chipping Hill	22UC2	Urban	Minor	1193	975	1.120413	1.135018	1337	1107
	CH The Avenue	22UC2	Urban	Minor	475	606	1.120413	1.135018	532	688
	CH Collingwood Road	22UC2	Urban	Minor	430	425	1.120413	1.135018	482	482
High Street Witham	B1389 NE	22UC2	Urban	Minor	211	393	1.120413	1.135018	236	446
	Maldon Road	22UC2	Urban	Minor	242	238	1.120413	1.135018	271	270
	B1839 SW	22UC2	Urban	Minor	247	318	1.120413	1.135018	276	361
	HS Collingwood Road	22UC2	Urban	Minor	193	345	1.120413	1.135018	216	391
Gershwin Blvd Witham	B1839 Hatfield Road	22UC2	Urban	Minor	771	579	1.120413	1.135018	864	657
	Gershwin Blvd	22UC2	Urban	Minor	355	267	1.120413	1.135018	398	303
	B1389 SW	22UC2	Urban	Minor	731	1052	1.120413	1.135018	819	1194
	New Arm				0				0	0
The Street Hatfield Peverel	The Street E	22UC8	Rural	Minor	457	442	1.133066	1.146699	518	507
	B1019 Maldon Road	22UC8	Rural	Minor	646	598	1.133066	1.146699	732	686
	The Street W	22UC8	Rural	Minor	543	886	1.133066	1.146699	615	1016
Great Notley Southernmost junction	GN A131 N	22UC1	Urban	Principal	882	877	1.102793	1.114978	973	978
	GN London Road N	22UC1	Urban	Minor	803	486	1.109786	1.122048	891	545
	GN London Road S	22UC1	Urban	Minor	169	241	1.109786	1.122048	188	270
	GN A131 S	22UC1	Urban	Principal	756	1345	1.102793	1.114978	834	1500
Cuckoo Way Great Notley	CW A131 N	22UC1	Urban	Principal	847	970	1.102793	1.114978	934	1082
	Cuckoo Way	22UC1	Urban	Minor	522	531	1.109786	1.122048	579	596
	CW A131 S	22UC1	Urban	Principal	829	870	1.102793	1.114978	914	970
Panners Northern Braintree	PB N B1256	22UC1	Urban	Minor	649	710	1.109786	1.122048	721	797
	PB N A120 E	22UC0	Urban	Trunk	348	347	1.126082	1.14136	392	396
	PB Link N	22UC1	Urban	Principal	822	585	1.102793	1.114978	906	652
	PB A120 W	22UC1	Urban	Trunk	479	982	1.119157	1.131522	536	1112
Panners Southern Braintree	PB Link S	22UC1	Urban	Principal	784	1261	1.102793	1.114978	865	1406
	PB S A120 E	22UC1	Urban	Trunk	452	238	1.119157	1.131522	506	270
	PB S B1256	22UC1	Urban	Minor	669	452	1.109786	1.122048	743	507
	PB A131 S	22UC1	Urban	Principal	890	824	1.102793	1.114978	981	919
Springwood Drive Braintree	Springwood Drive	22UC1	Urban	Minor	254	683	1.109786	1.122048	282	766
	SW B1256 Rayne Road	22UC1	Urban	Minor	833	494	1.109786	1.122048	924	554
	SW Pods Brook Road	22UC1	Urban	Minor	883	611	1.109786	1.122048	980	686
	SW Rayne Road	22UC1	Urban	Minor	382	249	1.109786	1.122048	424	279
Pierrefitte Way Braintree	PW Aetheric Road	22UC1	Urban	Minor	923	480	1.109786	1.122048	1024	538
	PW B1256 E	22UC1	Urban	Minor	37	111	1.109786	1.122048	41	124
	PW B1256 Pierrefitte Way	22UC1	Urban	Minor	624	655	1.109786	1.122048	692	735
	PW B1256 Rayne Road	22UC1	Urban	Minor	524	760	1.109786	1.122048	582	853
Church Street Braintree	B1053 Church Street	22UC1	Urban	Minor	566	512	1.109786	1.122048	628	574
	Convent Hill	22UC1	Urban	Minor	730	442	1.109786	1.122048	810	496
	Bradford Street	22UC1	Urban	Minor	555	959	1.109786	1.122048	616	1076
Broad Road Braintree	BR A131 N	22UC1	Urban	Principal	1048	741	1.102793	1.114978	1156	826
	BR A131 S	22UC1	Urban	Principal	762	826	1.102793	1.114978	840	921
	Broad Road	22UC1	Urban	Minor	336	607	1.109786	1.122048	373	681
Marks Farm	MF A131 N	22UC1	Urban	Principal	762	573	1.102793	1.114978	840	639
	MF A120 E	22UC1	Urban	Trunk	2031	1409	1.119157	1.131522	2273	1595
	MF A120 S	22UC1	Urban	Trunk	2670	2272	1.119157	1.131522	2988	2571
	MF Coggeshall Road	22UC1	Urban	Minor	423	632	1.109786	1.122048	470	710

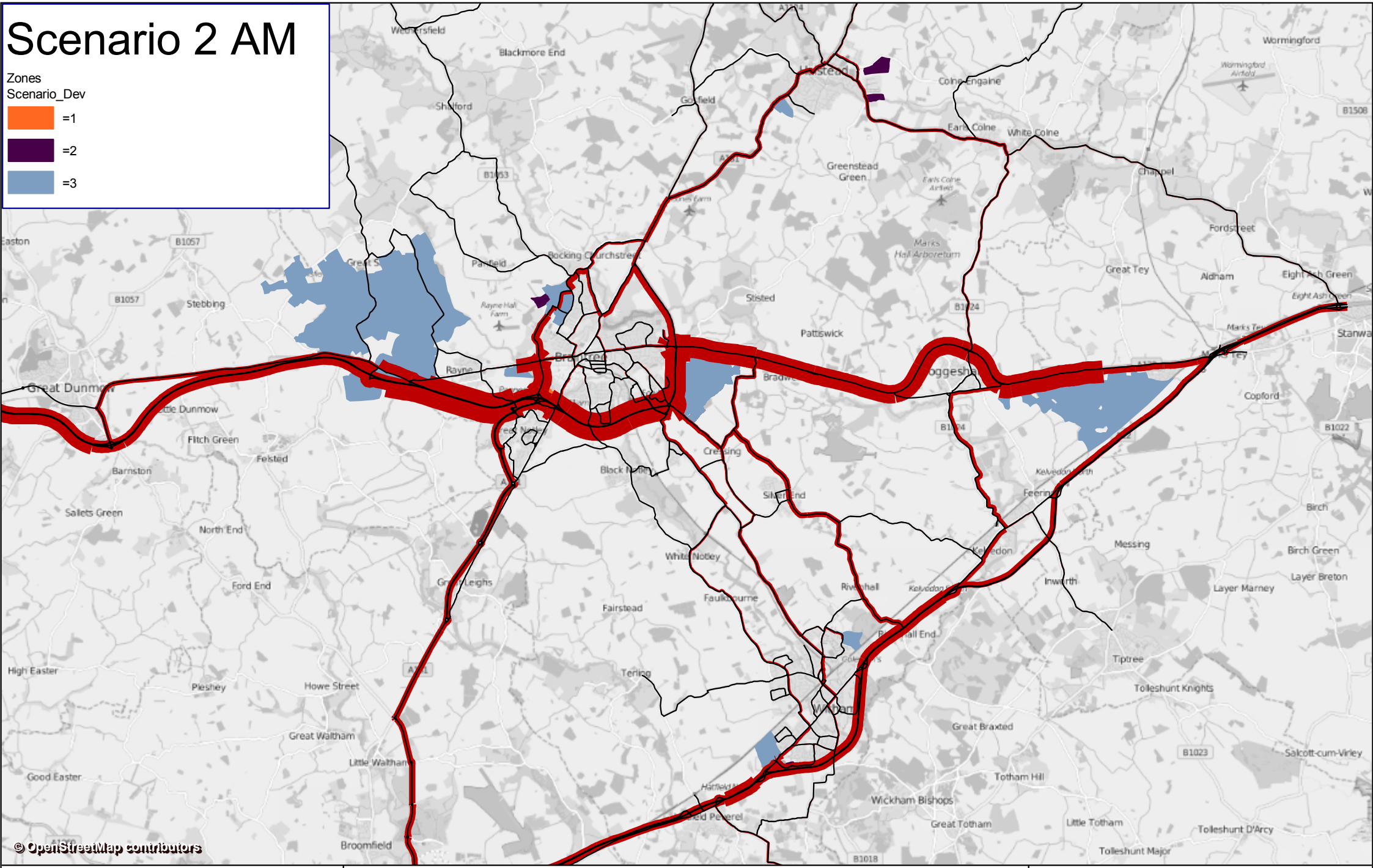
Appendix I: VISUM
Graphics



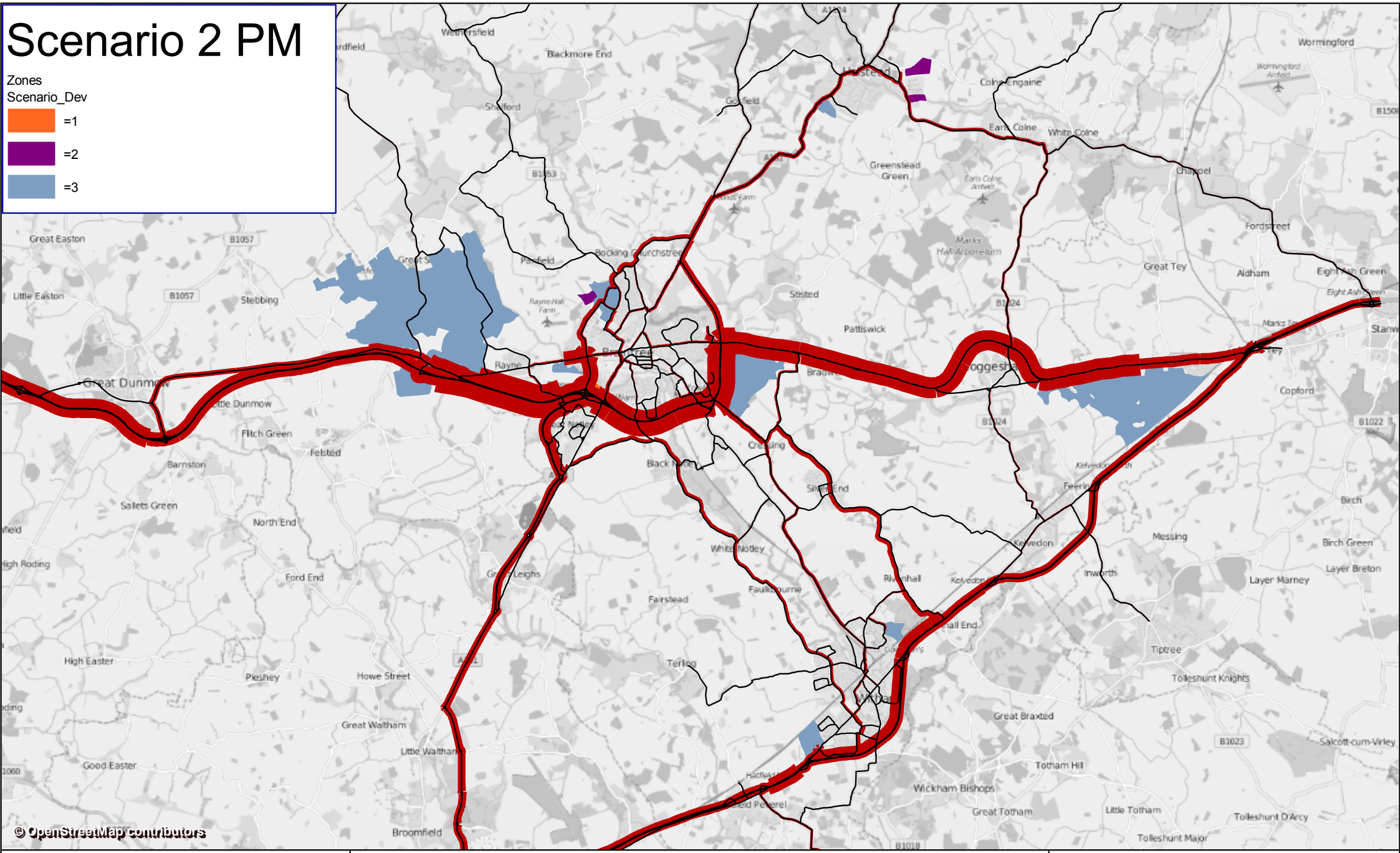
VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



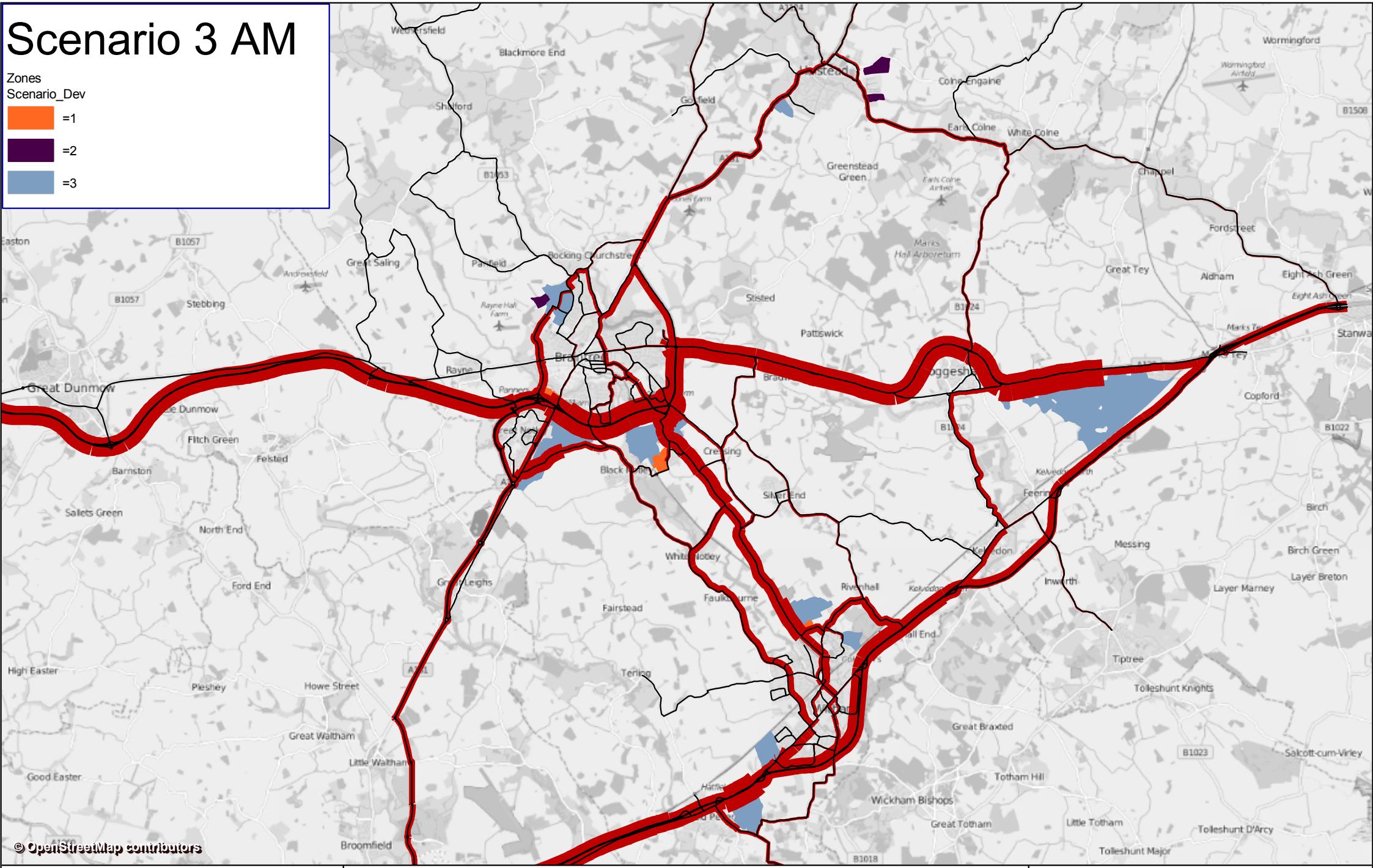
VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



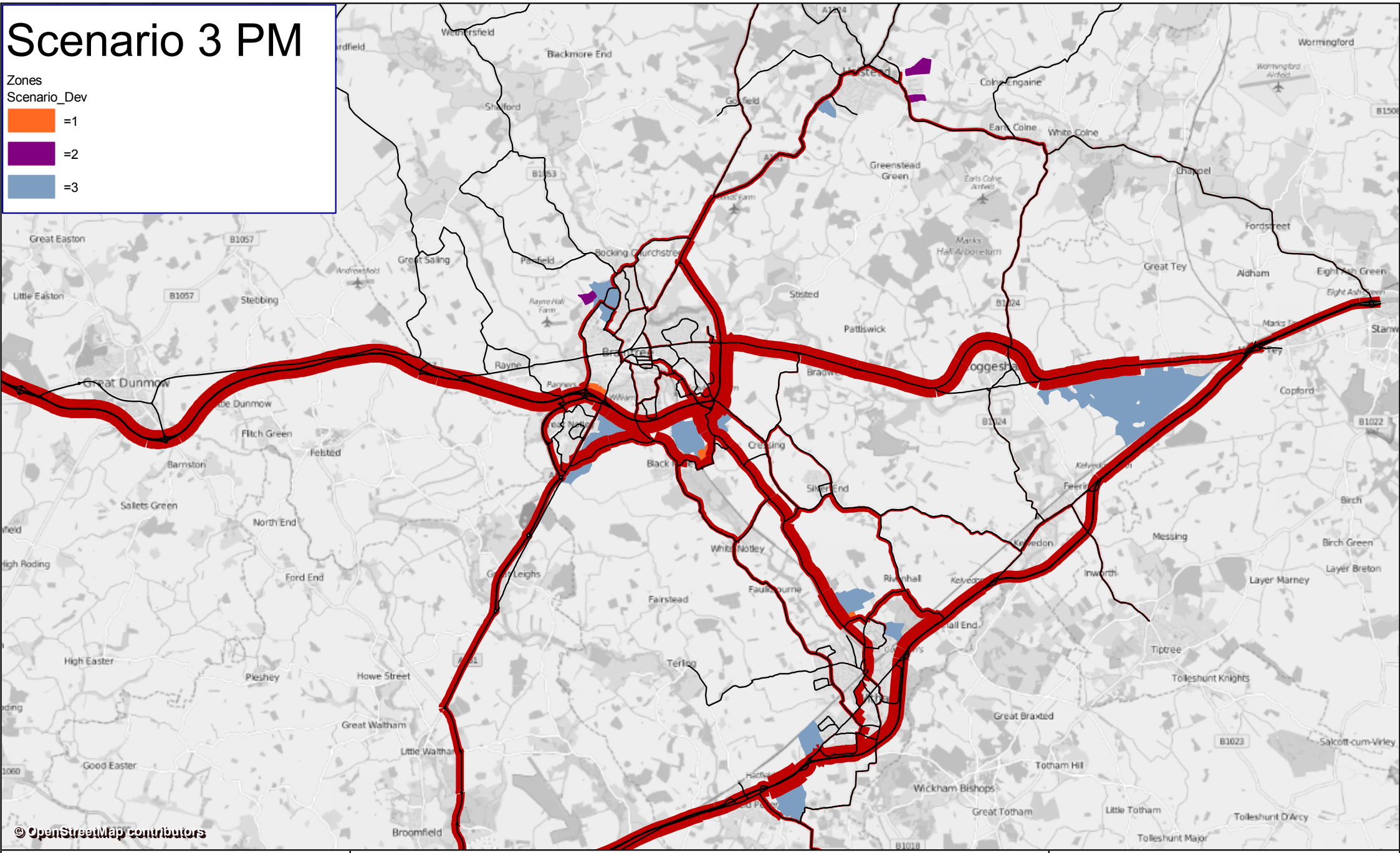
VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



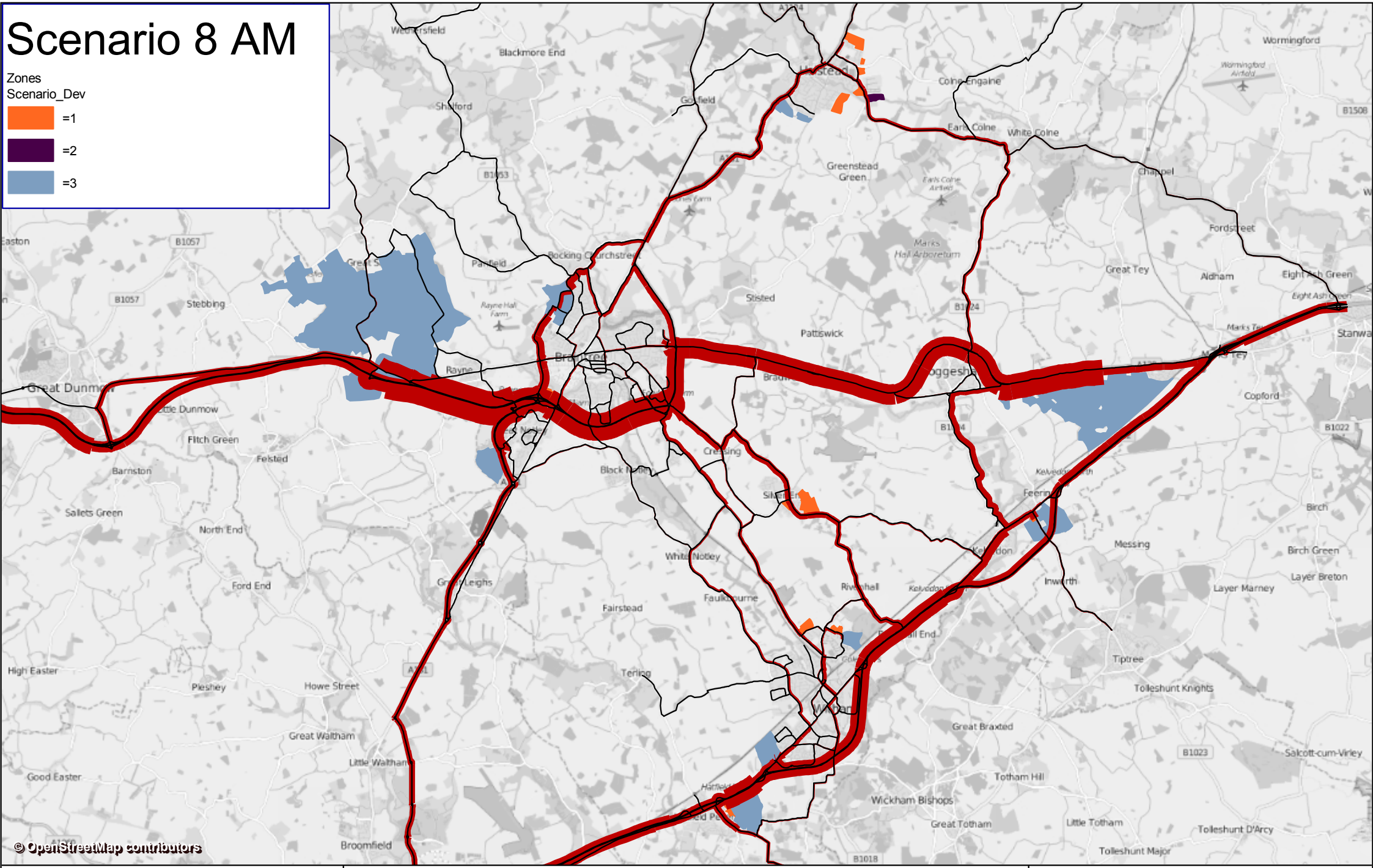
VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



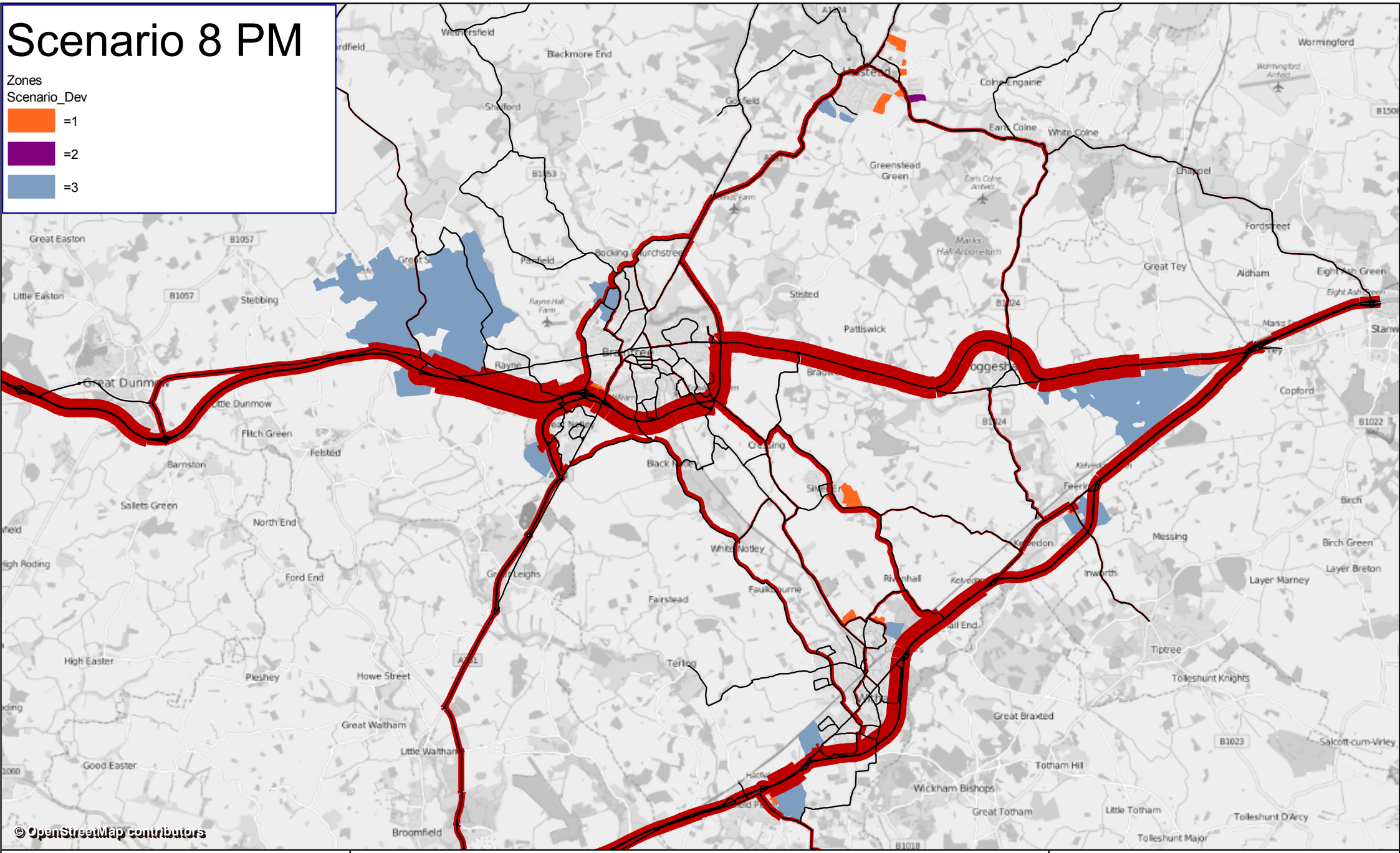
VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



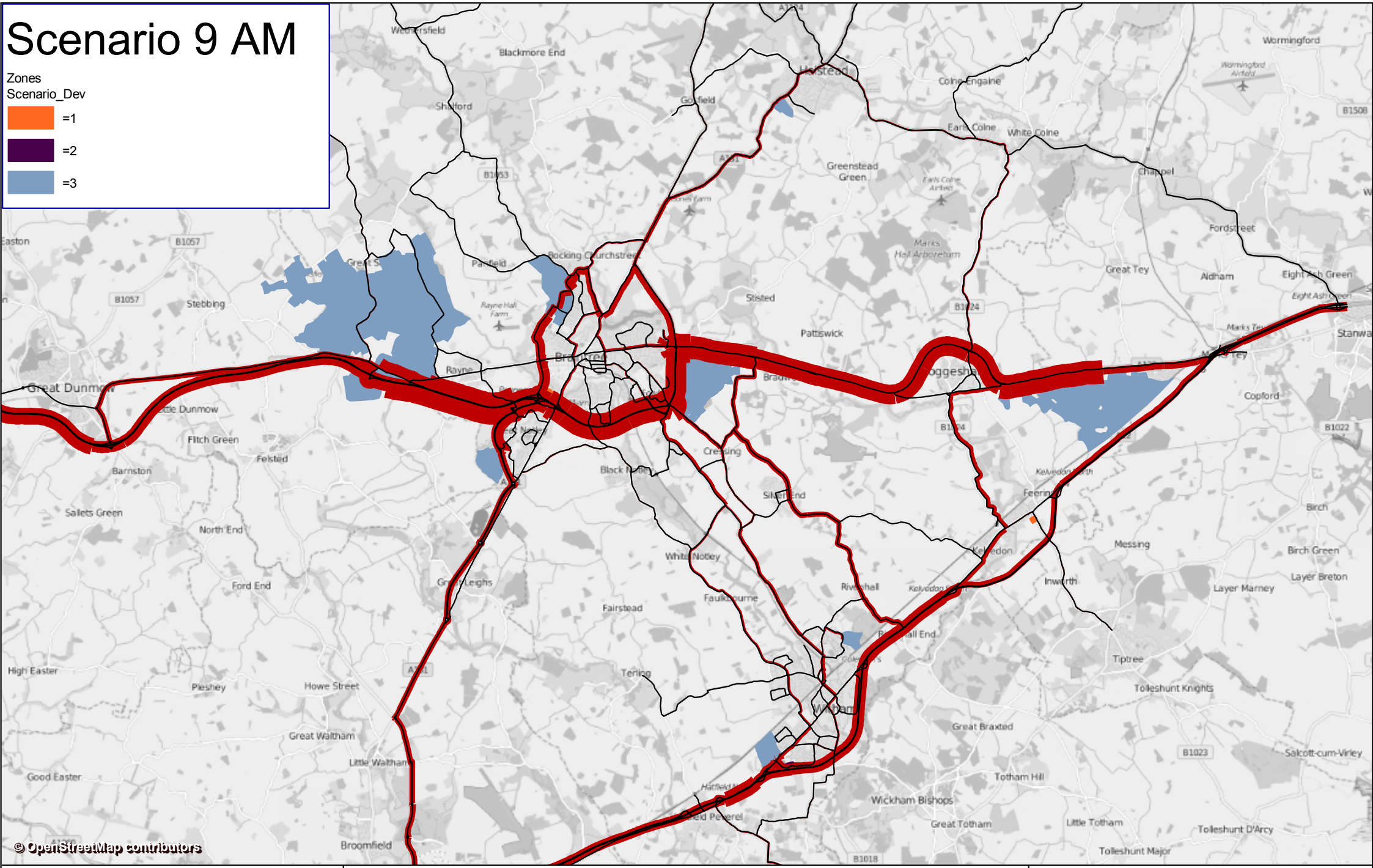
VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



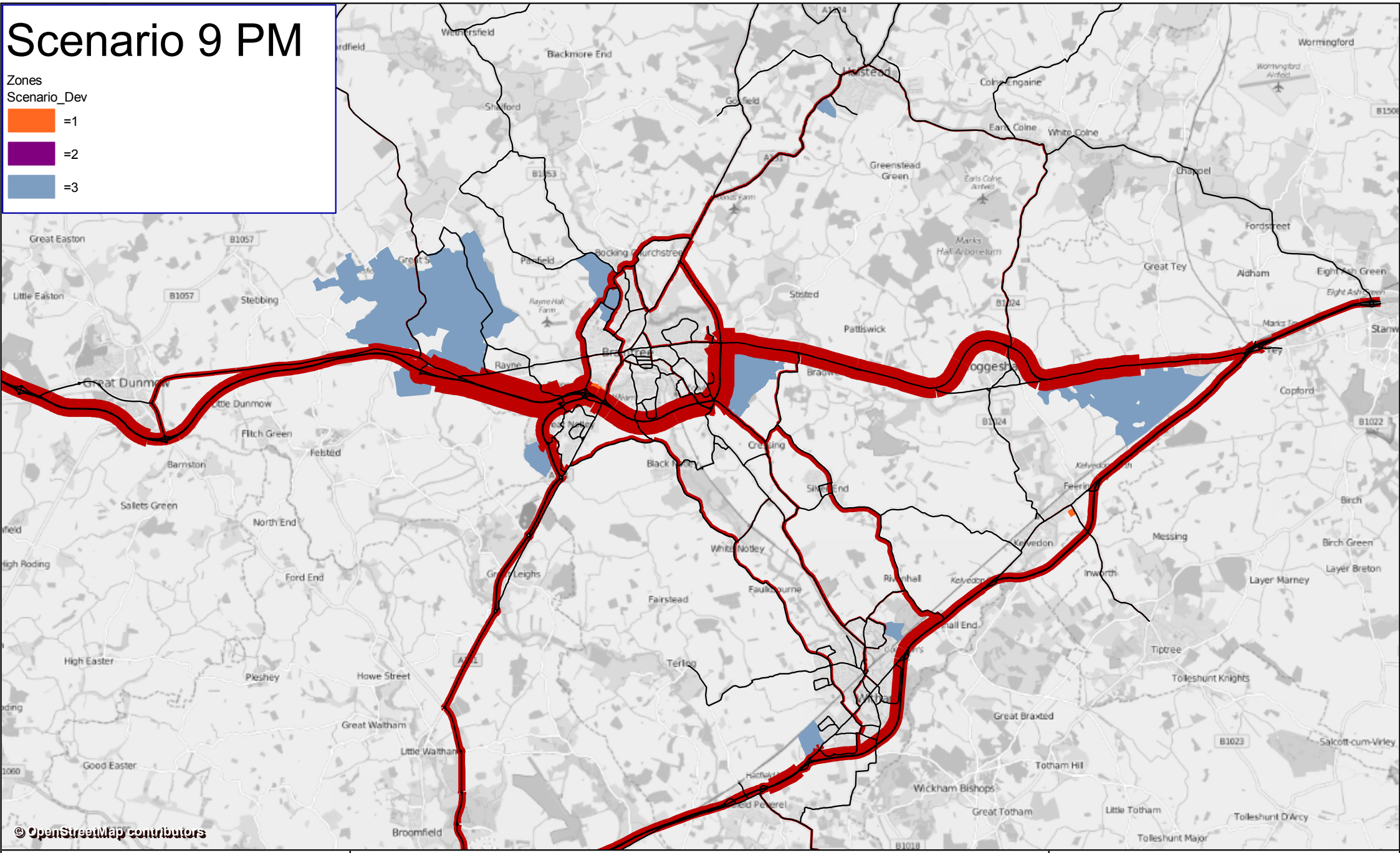
VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016

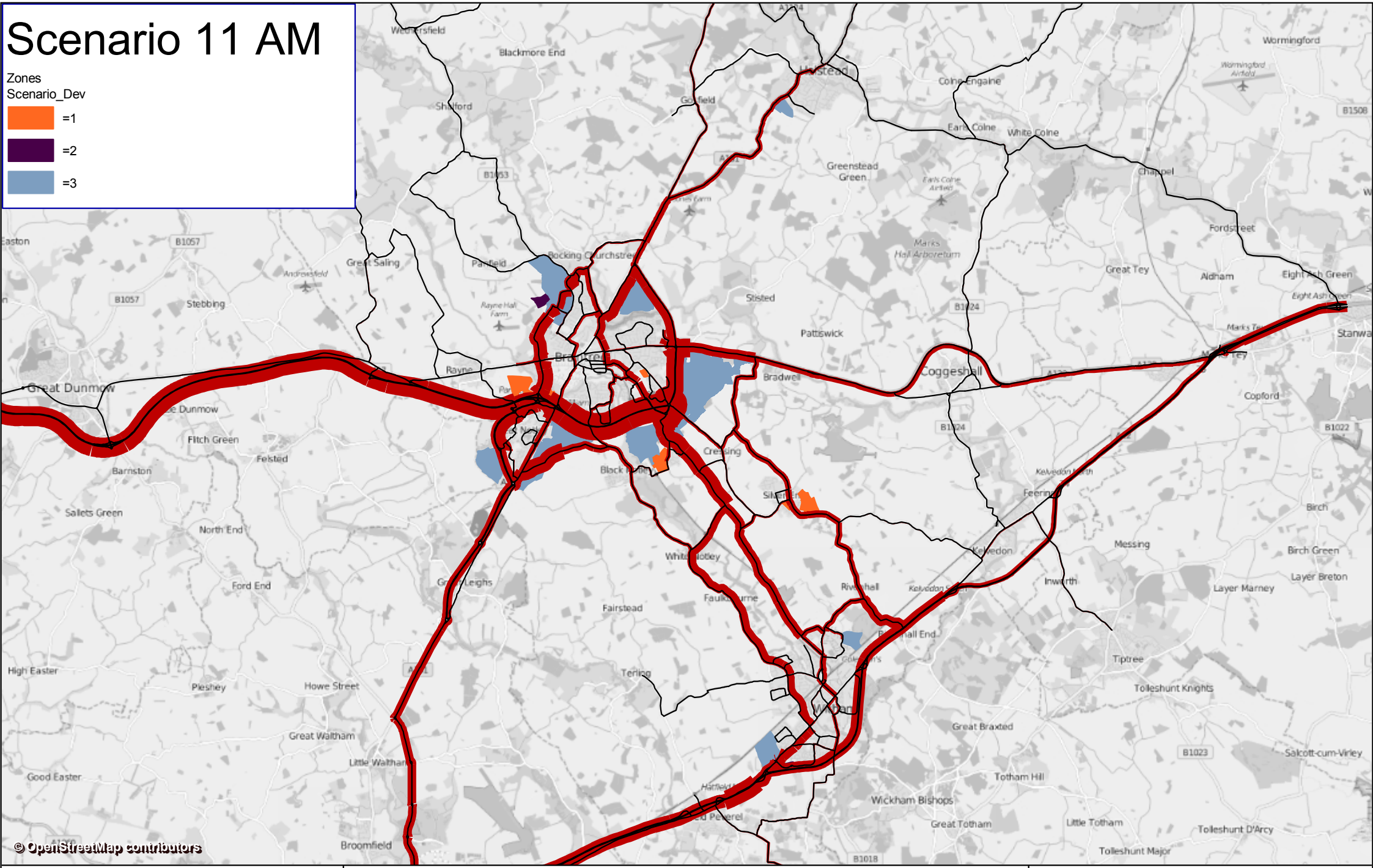


VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016

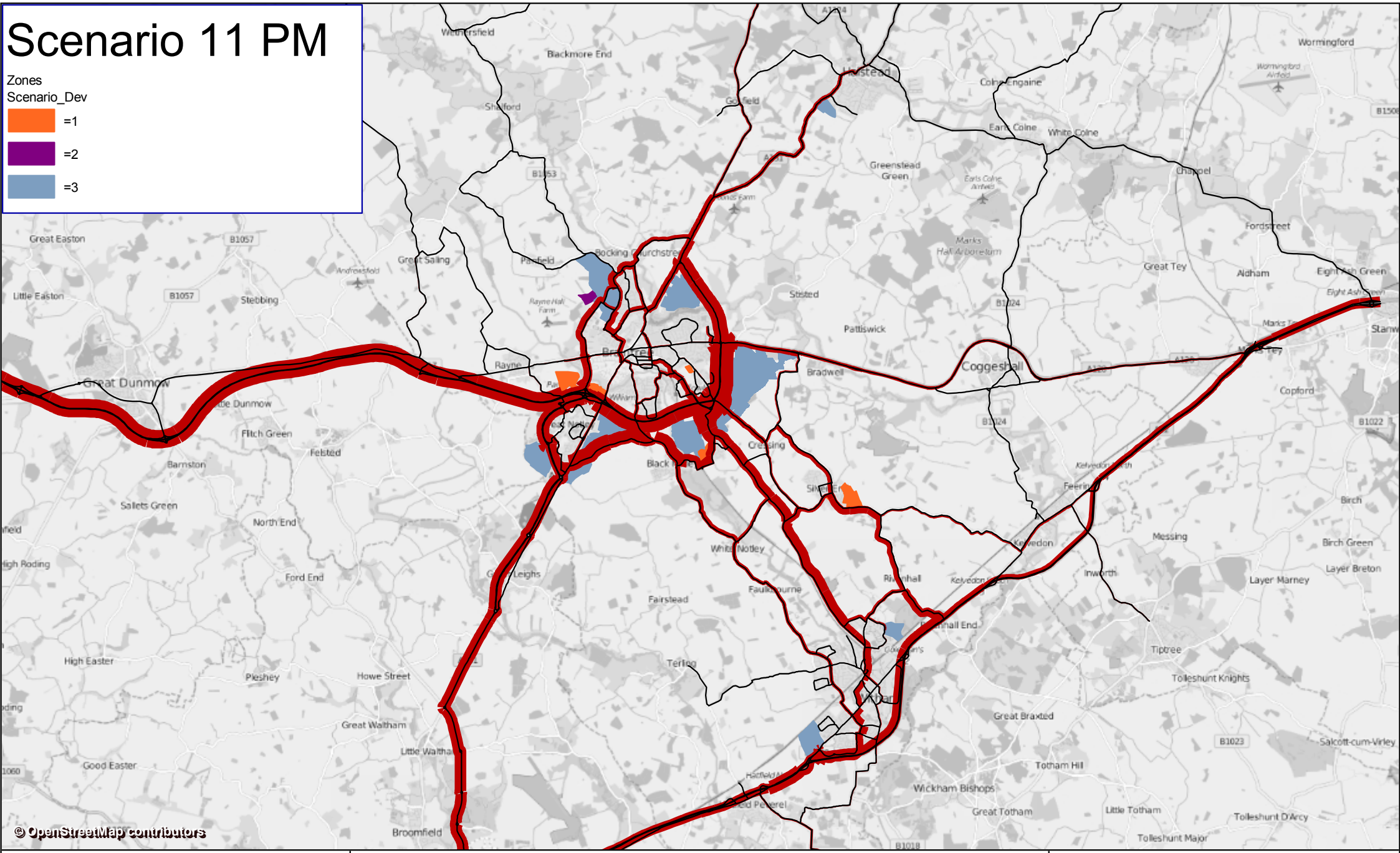
Scenario 11 AM

Zones
Scenario_Dev

- =1
- =2
- =3



VISUM 15.00 PTV AG	Braintree AM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016



VISUM 15.00 PTV AG	Braintree PM New Panf Link Cap Restrict.ver	erstellt am: 12.01.2016