Essex Highways

Basildon Local Plan

Sensitivity Test Modelling

December 2021

RINGWAY JACOBS | Essex County Council

Document Control Sheet

Report Title	**Basildon Local Plan: Sensitivity Test Modelling**
Project Number	B3553R9A
Status	Reviewed
Revision	Issue 4
Control Date	16/12/2021

Table of revisions

Original Version Produced	05/11/2021	Initial working draft	Issue 1
Reviewed	11/11/2021	Updated working draft	Issue 2
Reviewed	01/12/2021	Penultimate draft	Issue 3
Published	16/12/2021	Final	Issue 4

Distribution

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ECC	Ben Fryer	Electronic email

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Executive Summary

Basildon Borough Council's (BBC) Revised Publication Local Plan 2018 provides the planning framework for future growth and development within the Basildon Borough area up to and beyond 2034. Work undertaken in 2017 and 2018 assessed the levels of growth associated with the draft and final Publication Local Plan 2018. The purpose of this sensitivity test work was to re-assess the borough-wide impact of the modification to the Local Plan proposed by Basildon Borough Council as set out in the Additional Modifications Consultation on previous findings and conclusions – more particularly, previously identified traffic flows and highway mitigation.

This work was undertaken using the same approach set out in the THIA March 2018 report but with a number of key changes proposed for the Local Plan Growth scenario. The most significant changes include a focus on the increase in residential units in Basildon Town Centre, the removal of the Pound Lane A127 grade-separated junction from the 'Do Something' scenario to account for a change in committed and Local Plan schemes, and adjustments made to the residential trip rates, to account for a suitable level of mode shift as a result of potential sustainable travel impacts in the borough. The modelling methodology was two-tier in nature and involved a simple skeleton Visum model and spreadsheet-based modelling framework for the borough area generating flows for a set of as many as thirty-five Junctions9 and LINSIG local junction models, as listed in Table 1. Figure 1 shows the locations of the junctions.

Junction performance was tested for each existing junction layout and improved layout where junction mitigation was previously proposed in the THIA March 2018 report. Where required, updated junction mitigation was tested at concept level to identify potential improvements suitable for the new development traffic patterns. Junctions operating at or over a volume/capacity ratio (V/C) were generally considered to be exceeding capacity. However, marginal capacity exceedances with values between 1.00 and 1.10, were considered suitable to be mitigated by other interventions, such as more ambitious sustainable modal shift, peak spreading or increased homeworking, which should be considered prior to implementing costly highway improvements or overproviding highway capacity.

Overall, all but one of the junctions with mitigation measures operate at or under a maximum V/C of 1.10. The exception is W3 (A132 Runwell Road / Church End Lane). With the junction performing close to the 1.10 V/C threshold, there is potential for further background traffic reductions with more sustainable travel, and the proposed mitigation is considered a proportionate and acceptable solution to accommodate Local Plan demands.

The A132 between Ba4 and W5 was also investigated and dualling is recommended.

1 Introduction

Background

Basildon Borough Council's (BBC) Revised Publication Local Plan 2018 provides the planning framework for future growth and development within the Basildon Borough area up to and beyond 2034. Work undertaken in 2017 and 2018 assessed the levels of growth associated with the draft and final Publication Local Plan 2018. This work is documented in the following reports:

- Basildon Local Plan, Part 1 – Draft Local Plan Transport & Highway Impact Assessment (THIA), July 2017
- Basildon Local Plan, Part 2 – Publication Local Plan THIA, March 2018
- Basildon Local Plan, Part 2 – THIA Addendum, August 2018
- Basildon Local Plan Publication THIA – Pound Lane / Cranfield Park Road Junction Addendum, October 2019

Scope of Work

The purpose of this sensitivity test work is to re-assess the borough-wide impact of the modification to the Local Plan proposed by Basildon Borough Council as set out in the Additional Modifications Consultation on previous findings and conclusions – more particularly, previously identified traffic flows and highway mitigation.

This work has been undertaken using the same approach set out in the THIA March 2018 report (as set out in further detail below) but with the following changes proposed for the Local Plan Growth scenario:

- An increase in residential units in Basildon Town Centre (from approximately 3,000 units to 5,000 units).
- Further adjustments to larger residential sites across the borough (50 units or more) to account for any modifications proposed to the strategic sites since the THIA March 2018 assessment.
- Adjustments made to the Do Minimum (DM) and Do Something (DS) highway network assumptions (including the removal of the Pound Lane A127 grade-separated junction) to account for a change in committed and Local Plan schemes.
- Adjustments to the residential trip rates, to account for a suitable level of mode shift as a result of potential sustainable travel impacts in the borough.

This work does not incorporate any changes in Local Plan development post August 2021.

Report Structure

The remainder of this report is set out as follows:

- Related Studies – provides a summary of related studies and concurrent Local Plan assessments.
- Sensitivity Modelling Scenarios – sets out the highway, development and adjusted trip rate assumptions included within the sensitivity test scenario modelled.
- Sustainable Transport Interventions – sets out the appraisal of sustainable transport interventions identified across the borough.
- Sensitivity Modelling Results – sets out the results for each of the junctions modelled and the identified mitigation measures tested.
- Cross Boundary Impacts – sets out the potential cross-boundary impacts of the sensitivity test scenario modelled at a number of locations across the borough.
- Summary – provides a summary of the results and conclusions of the sensitivity test modelling.

2 Related Studies

THIA Assessments

As noted above, this sensitivity test assessment has been undertaken using the same approach set out in the THIA March 2018 assessment (hereafter referred to simply as the THIA March 2018 assessment or THIA March 2018 report). The THIA March 2018 assessment is to be distinguished from the THIA Addendum (August 2018) which was more narrowly focused on minor changes to the Publication Local Plan.

The THIA March 2018 report included an updated modelling methodology relative to that previously followed in 2017, and tested the overarching package of highway measures required to help mitigate the traffic impact associated with expected Local Plan growth. The updated modelling methodology was two-tier in nature and involved a simple skeleton Visum model and spreadsheet-based modelling framework for the borough area generating flows for a set of as many as thirty-five Junctions9 and LINSIG local junction models, as listed in Table 1. Figure 1 shows the locations of the junctions.

The spreadsheet element of the modelling framework generated the future traffic growth, vehicle trip generation and distribution. The Visum model was used to assign development-only traffic across the network. The assigned future development flows were then combined with background traffic growth from the spreadsheet model and assessed in individual junction models for each scenario. It is important to note that the model outputs did not fully account for detailed considerations including traffic interactions, dynamic re-assignment and individual driver behaviour.

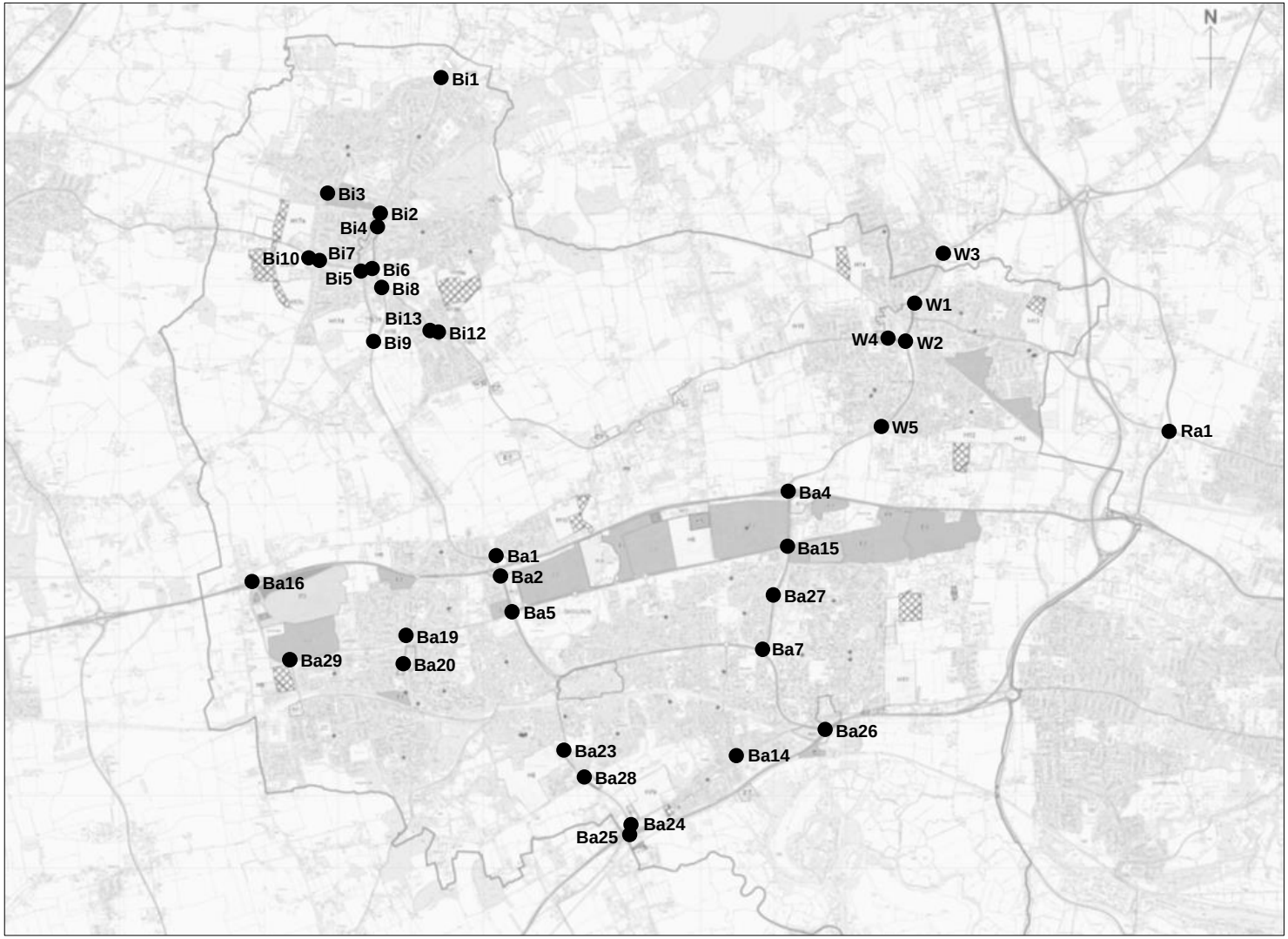
The model provided an appraisal of traffic problems across the core BBC geographical area including vehicle demand, junction performance and stretches of road likely to be operating above their theoretical capacity, highlighting locations where some form of mitigation is likely to be required to reduce the traffic impact of forecast development. The modelling approach was informed by accepted modelling principles (e.g., DfT/WebTAG) and was deemed reasonable in scale and ‘fit for purpose’ by Essex Highways in consultation with Essex County Council (ECC) and BBC to assess the highway network within the Borough under the proposed development scenarios.

Table 1: Local Junction Model Locations

ID	Location	Junction Type
Basildon		
Ba1	A127 / A176 Noak Bridge Interchange North	Standard Roundabout
Ba2	A127 / A176 Noak Bridge Interchange South	Standard Roundabout
Ba4	A127/A132 Nevendon Interchange Junction	Signal Roundabout
Ba5	Cranes Farm Road / A176 Upper Mayne / St. Nicholas Lane	Standard Roundabout
Ba7	Broadmayne / South Mayne / Ashlyns	Standard Roundabout
Ba14	B1464 London Road / High Road / Clay Hill Road	Mini Roundabout
Ba15	Cranes Farm Road / A132 East Mayne	Standard Roundabout
Ba16	A127 / B148 West Mayne (Dunton) Interchange	Large Roundabout
Ba19	High Road / West Mayne / St. Nicholas Lane	Standard Roundabout
Ba20	High Road / Somerset Road / Laindon Link	Standard Roundabout
Ba23	A176 Nether Mayne / Hospital Access	Signal Roundabout
Ba24	A13/A176 Five Bells Interchange North	Standard Roundabout
Ba25	A13/A176 Five Bells Interchange South	Standard Roundabout
Ba26	A13/A132 Pitsea Interchange	Large Roundabout
Ba27	A132 East Mayne / Whitmore Way / Felmores	Standard Roundabout
Ba28*	A176 Nether Mayne / Dry Street	Signal (4-arm)
Ba29	B148 West Mayne / Mandeville Way	Standard Roundabout
Billericay		
Bi1	B1007 Stock Road / Queens Park Avenue / Potash Road	Standard Roundabout
Bi2	B1007 Stock Road / Radford Way	Mini Roundabout
Bi3	Mountnessing Road / Perry Street / Radford Way	Standard Roundabout
Bi4	B1007 High Street / Norsey Road / Western Road	Signal (4-arm)
Bi5	A129 London Road / High Street / Sun Street	Standard Roundabout
Bi6	A129 Sun Street / Chapel Street	Standard Roundabout
Bi7	A129 London Road / Tye Common Road / Western Road	Signal (4-arm)
Bi8	A129 Southend Road / A176	Standard Roundabout
Bi9	A176 / Kennel Lane / Laindon Road	Standard Roundabout
Bi10	A129 London Road / Mountnessing Road	Priority (3-arm)
Bi12	A129 Southend Rd / Outwood Common Road	Priority (3-arm)
Bi13	A129 Southend Rd / Hickstars Lane	Priority (3-arm)
Wickford		
W1	A132 Runwell Road / A132 / Runwell Road	Standard Roundabout
W2	A132 Golden Jubilee Way / Radwinter Avenue / A129 London Road	Standard Roundabout
W3	A132 Runwell Road / Church End Lane	Priority (3-arm)
W4	A129 London Road / Nevendon Road / High Street	Signal (4-arm)
W5	A132 / Cranfield Park Road / Nevendon Road	Standard Roundabout
Rochford		
Ra1	A1245 Chelmsford Road / A129 London Road	Standard Roundabout

** It should be noted that Ba28 has been tested as a signal 4-arm junction as the existing layout for this sensitivity test. The signalised 4-arm layout was tested as junction mitigation in the THIA March 2018 report (with priority 3-arm as existing), but signalised 3-arm was subsequently delivered in the field. The 4th arm will be added once development to the east of the A176 is delivered.*

Figure 1: Junction Locations



A separate addendum was subsequently produced in October 2019, called 'Basildon Local Plan, Publication Local Plan Transport & Highway Impact Assessment – Pound Lane / Cranfield Park Road Junction Addendum', which explored the impact of the Local Plan on the highway network with and without the proposed A127 grade-separated junction at Pound Lane / Cranfield Park Road. This also provided an assessment of alternative mitigation in 2025 and 2034 without the A127 grade-separated junction.

The modelling approach for the October 2019 addendum was consistent with the THIA March 2018 assessment and used the same development numbers. However, the study area focused on the local and primary road network around the A127 grade-separated junction, covering Wickford, East Basildon, North Benfleet and Bowers Gifford. Eleven junctions were considered for further capacity appraisal, with alternative mitigation measures proposed at five junctions which operated over-capacity without the A127 grade-separated junction. These comprise of Ba7, Ba15, W1, W3 and Ba30. Analysis also suggested that Pound Lane would not need upgrading within the Local Plan period without a grade-separated junction on the A127 from a capacity perspective. Furthermore, the existing left turn out of Pound Lane into the A127 (accommodating the south-to-west movement) will accommodate local traffic flow growth within the Local Plan. Optimisation of the signal timings at the junction of Pound Lane and B1464 London Road will enable the junction to operate within capacity by 2034.

Ba30 – Sadlers Farm Roundabout – was not assessed for mitigation in the earlier THIA March 2018 work because it was subject to a design study to investigate early options for improvements, with no preferred scheme determined. The 2019 Addendum work considered one example capacity improvement at the roundabout to demonstrate that the junction might reasonably accommodate Local Plan traffic without the delivery of the A127 grade-separated junction. Because a separate package of improvement measures is being considered at the roundabout separate to Local Plan mitigation it has not been taken through for further modelling as part of this sensitivity test assessment.

Following publication in 2019, BBC's Revised Publication Local Plan has been subject to Additional Proposed Modifications, which are due for public consultation in early 2022. In order to consider the additional modifications to the submitted Local Plan, additional evidence base work is being undertaken to inform any potential changes. It includes the preparation of updated transport modelling for the whole borough.

The 2019 Pound Lane Addendum work (amongst other studies as set out below under 'Wider Studies') has been referred to throughout the progress of this sensitivity test assessment in order to utilise any findings or solutions presented previously. This ensures the work is suitably aligned and also avoids unnecessary duplication of work or the proposal of different solutions.

It should be noted that while the 2019 Pound Lane Addendum work explored traffic impacts associated without the Pound Lane A127 grade-separated junction it focussed on

a much more contained study area. This sensitivity work, therefore, while also testing the impact without the Pound Lane A127 grade-separated junction, compares its results with the borough-wide THIA March 2018 assessment, which considered impacts across the wider area of Basildon, Billericay and Wickford.

Concurrent Local Plan Assessments

A separate Vissim modelling exercise has been undertaken using the Basildon Town Centre VISSIM Model (BTCVM) to test the impact of proposed revisions to the highway network in Basildon Town Centre. The town centre improvements tested in the modelling include the downgrading of key links and changes effected to junctions (Southernhay and Great Oaks) and the removal of vehicular traffic from Little Oaks. While there is overlap with the sensitivity modelling, the BTCVM provides a more detailed assessment across a much smaller study area, generating detailed modelling outputs such as network statistics, journey times, congestion heat maps and video files.

A separate strategic modelling exercise has been undertaken, using the Enhanced Essex Countywide Strategic Model (EECSM) in order to assess the concept of a link road in South West Billericay, testing the function of both a development only access (with limited through traffic) or a more strategic full link road (for through traffic and development access). While there is overlap with the sensitivity modelling, the EECSM provides a more appropriate tool than the previous THIA March 2018 spreadsheet-based approach, and provides a more robust assessment of the scheme and better understanding of the need for infrastructure.

It should be noted that the sensitivity test assessment has excluded modelling of the junction which joins the Billericay Link Road (A176 / Kennel Lane / Laindon Road junction), on the assumption that this would be upgraded to accommodate the Billericay Link Road and designed with sufficient capacity to accommodate forecast growth.

The EECSM has only recently become available, and also doesn't provide a like-for-like assessment to the THIA March 2018 assessment. Therefore, this model was not used for this sensitivity test assessment.

Wider Studies

In addition to the 2017-2019 THIA assessments and concurrent work as noted above, the following wider studies were also considered when undertaking this assessment. Documents recording these studies were reviewed to ensure any work would be progressed from an aligned baseline, and any previous findings of relevance could be built upon in a consistent and coherent approach for the additional tests.

Mitigation scheme appraisals -

- Basildon Local Plan Examination Support: Review of earlier THIA Modelling (January 2020)
- Basildon Local Plan Examination Support: Review of Church End Lane / A132 Junction – W3 (October 2020)

This sensitivity test takes into account the proposed mitigation schemes tested previously at the relevant locations, with particular regard to the findings related to capacity and junction performance improvements, safety improvements, and feasibility constraints within the junction surroundings.

Air Quality assessments -

- Air Quality Review (May 2020)

This sensitivity test takes into account the findings set out in the Air Quality Review, which provides an assessment on whether air quality is adequately considered within the Local Plan with regards to the potential impact of development and the robustness of the policies to take account of the significance of air quality issues. This study acknowledges the impact of sustainable transport options and proposed highway network schemes which have the potential to lead to improvements in air quality at specific congestion hotspots.

Mode shift assessments -

- Basildon Local Plan Examination Support: Assessing Implications of Mode Shift (January 2020)

This sensitivity test takes into account the proposed assessment with regards to mode shift, and the potential magnitude this change has on future traffic levels. The study has been used as a starting point for shaping the approach set out below with regards to the mode shift trip rate adjustments to account for sustainable transport interventions within the borough.

Engineering reports -

- Basildon Local Plan: Pound Lane, Bowers Gifford, Technical Note (May 2021)
- Basildon Local Plan: A127 Junction with Cranfield Park Road, Nevendon, Technical Note (May 2021)
- Basildon Local Plan: Frithwood Lane, Billericay, Outline Design Options, Technical Note (September 2020)

This sensitivity test acknowledges but does not incorporate the conclusions or recommendations of these engineering reports which focus on potential improvements

required in the vicinity of the Pound Lane junction or to support the proposed Local Plan development sites for reasons other than capacity (e.g., safety-related improvements).

Other Studies

In addition to the studies specified above, there are a number of other studies that outline additional infrastructure requirements for the borough They should be consulted in addition to those listed above, in order to obtain an all-round view.

3 Sensitivity Modelling Scenarios

Local Plan Growth

Table 2 below provides a summary of the Local Plan growth agreed for inclusion in the sensitivity test assessment. As set out below, a total of 21,216 residential units were included across the borough (a noticeable increase from the total of 18,283 residential units included within the THIA March 2018 assessment). A total of 346,581 sqm of employment (including retail and commercial) and a capacity of 6,195 pupils within education (primary and secondary schools) were also included, as included in the THIA March 2018 assessment.

Table 2: Sensitivity Test Local Plan Growth

Location	Residential	Employment	Education
Basildon Town Centre	5,000	326,410	3,990
Basildon (wider borough)	8,130		
Billericay	3,642	6,649	840
Wickford	4,445	13,522	1,365
Total	**21,216**	**346,581**	**6,195**

As noted above, the key focal point of this sensitivity test is to test the impact of an increased number of residential units within Basildon Town Centre (assuming the most likely distribution of units across the Town Centre; any variation on the assumed distribution will have little to no impact on the wider highway network modelling work), with approximately 5,000 units now proposed within the Local Plan period. This comprises both forecast development sites and completed development sites that have been built since 2014. These sites are listed in Table 3 below.

Table 3: Basildon Town Centre Indicative Residential Development Sites

Development	Units	Build Phase
A – Car Park 14	109	Forecast
B – Time Square	219	Forecast
C – Car Park 11	27	Forecast
D – Car Park 12	109	Forecast
E – Trafford House	105	Forecast
F – Land at Market Square	269	Forecast
G – Town Centre North aka Former M&S site	293	Forecast
H – Church Walk House	44	Forecast
I – Acorn House Great Oaks	17	Forecast
J – East Walk and Southernhay	86	Forecast
K – Great Oaks (Fire, Police, Clinic) 2 locations	301	Forecast
L – QD/ Post Office & Car Park 2 Two locations	286	Forecast
M – Great Oaks (former Carphone warehouse)	173	Forecast
N – Former Toys r us	416	Forecast
O – Eastgate	1,532	Forecast
P – Former Youth Centre	11	Forecast
Youth Centre, Long Lynderswood	20	Completed
Northgate House, High Pavement	87	Completed
Kelting House, Southernhay	51	Completed

Development	Units	Build Phase
Acorn House, Great Oaks	9	Completed
Acorn House, Great Oaks	53	Completed
Trafford House, Station Way	384	Completed
The Icon, Southernhay	6	Completed
Phase 1B Westside North, Broadmayne	100	Completed
Basildon Westside North, (Gloucester Park) Phase 1A	84	Completed
Essex Ford, Cherrydown	208	Completed
Total	**5,001**	

Appendix A contains a breakdown of the revised residential Local Plan development, as well as a figure showing the spatial distribution of the housing, economic and retail Local Plan development.

Highway Network Assumptions

Table 4 below provides a summary of the highway network assumptions agreed for inclusion in the sensitivity test assessment. This includes the 'Do Minimum' (DM) which comprises the existing network with committed only schemes expected to be completed by 2034 (as known at the time of undertaking the assessment), and the 'Do Something' (DS), which also includes the highway schemes that have emerged out of the Local Plan assessment work. The additional schemes included in the DS scenario include:

- Link Road parallel to Burnt Mills Road
- West Mayne Link Road
- Billericay Link Road
- Southern Laindon Road, Billericay, two-way implementation

Table 4: Highway Network Assumptions

Highway Network Assumptions	Scenario	
	DM	DS
Additional northbound lane on A176 Nethermayne between Hospital Roundabout and Roundacre	Yes	Yes
Basildon Hospital access improvements	Yes	Yes
Additional lane on the A127 Nevendon Roundabout circulatory carriageway	Yes	Yes
A130 northbound widening to three lanes between Rettendon and Howe Green (A12 interchange)	Yes	Yes
Fairglen Interchange improvements (short term)	Yes	Yes
Link Road parallel to Burnt Mills Road	No	Yes
West Mayne Link Road	No	Yes
Billericay Link Road	No	Yes
Southern Laindon Road, Billericay two-way implementation	No	Yes
Basildon Town Centre Masterplan (2012) improvements (including: a new busgate on Southern Hay Road, two-way traffic operations on the northernmost section of Clay Hill Road, Station Way and Cherrydown East from one lane to two lanes and Cherrydown East reversed one-way direction)	Yes	Yes
Basildon Town Centre Regeneration (including: Great Oaks downgraded to one lane, Little Oaks and Link Way to be pedestrianised, Ghyllgrove bus gate to be open for traffic making a left turn on to the A1235, updates to junctions along Southern Hay)	Yes	Yes
The Tyefields to Pound Lane active travel link (i.e., for buses, cyclists and pedestrians)	NA*	

** The modelling accounted for bus and active modes through reduced vehicular trip rates rather than at the network assignment level.*

The most significant adjustment made to the highway network assumptions in comparison to the THIA March 2018 assessment are the following:

- The current Fairglen Interchange scheme has been included in both the DM and DS scenarios to recognise that it is a committed scheme (this scheme was only included in the DS scenario in the THIA March 2018 assessment).
- The Pound Lane grade-separated junction has been excluded from both the DM and DS scenarios in order to identify the borough-wide impacts of the Local Plan without this mitigation scheme in place (this scheme was only included in the DS scenario in the THIA March 2018 assessment).

4 Sustainable Transport Interventions

Introduction

The THIA March 2018 assessment included a section entitled 'Sustainable Transport Infrastructure Appraisal'. It comprised a desktop qualitative appraisal of sustainable transport interventions identified to help accommodate the growth in person trips projected in the borough by 2034.

This sensitivity test assumed the sustainable transport interventions addressed in the THIA March 2018 assessment with the following amendment and additions:

- East Basildon Active Travel Link: Active travel link for public transport and active travel only associated with new development to the west of Pound Lane (H11: 650 new homes and a community hub for education and leisure facilities, SD3 Bowers Gifford and North Benfleet Neighbourhood Plan area: 1,350 new homes) carrying new and/or diverted bus services between Pound Lane and Tyefields.
- Cycling Improvements: The Basildon Local Cycling and Walking Infrastructure Plan Plus (LCWIP+) 2021 (approved in July 2021) identifies several cycle route improvements across key destinations in Basildon Borough. In addition to the infrastructure improvements identified within the LCWIP+ something might be done to improve pedestrian and cycle connectivity over the A127 between its interchanges with the A176 and A132 in addition to the existing bridge just to the east of the A127/A176 Pipps Hill interchange (connecting Noak Bridge to the north of the A127 with Miles Gray Road to the south of the A127). Bridges at Pipps Hill Road North and Waterfront Walk and/or Gardiners Lane North and South would offer safer and quieter routes into northern and central Basildon to and from the north than those currently offered by the A176 and A132 corridors.

Vehicle Trip Rate Reduction Potentials

The THIA March 2018 report referenced a study undertaken in 2016 concerning mode shift potentials (undertaken to inform Local Plan assessments within Essex) which demonstrated that it is reasonable to assume that a higher proportion of trips will be made by sustainable modes where good sustainable transport is provided. Accordingly, a reduction in trip rates was applied in this assessment to future development depending on where development sites are located and their proximity to public transport. Further details follow below. Because background traffic flows remain unchanged outturn flows are considered over-estimates.

Mode Shift Trip Rate Adjustments

The THIA March 2018 assessment assumed a set of trip rates for different land uses that differed by development location where relevant. A study undertaken in January 2020 (Basildon Local Plan Examination Support: Assessing Implications of Mode Shift) proposed and then tested an approach to mode shift -related trip rate adjustments assuming changes in the definition of each development's location.

An almost identical approach was followed in this work. The differences were as follows:

- No changes were effected to employment-related trip ends simply because of the general location of new employment uses and a desire to not double-count trip reductions.
- The trip rates for residential developments located in Edge of Town Centre circumstances were simply reduced by 25% rather than accorded Town Centre status.
- The adjustment of the PM peak departure trip rate for suburban residential to eliminate an unexpected and illogical increase (rather than decrease) in trips within Wickford more particularly.

Town Centre rates were retained 'as is' simply because they are already 'competitively low' when compared to locations with good onward rail and other sustainable travel connections.

The mode shift trip rates adjustments used are as shown in Table 5 below. Appendix B provides the actual trip rates used in the assessment.

Table 5: Mode Shift Residential Trip Rate Adjustments

Current Rates	New Rates
Town Centre	Town Centre
Edge of Town Centre	75% current Edge of Town Centre rates
Suburban Area	Edge of Town Centre
Edge of Town	Suburban Area
Neighbourhood Centre	Neighbourhood Centre

Application of the above rate changes reduced residential trip-making by approximately 20% in the AM peak hour and approximately 17% in the PM peak hour. Overall, total trip-making (i.e., residential and employment) reduce by approximately 14% in the AM peak hour and approximately 12% in the PM peak hour.

5 Sensitivity Modelling Results

The identified traffic growth, modelling results and mitigation proposals for the sensitivity test scenario are presented in further detail below.

Junction Traffic Growth

Table 6 below sets out the total traffic flows expected at each local junction for the Local Plan sensitivity test growth scenario. The table also presents the impact of the sensitivity test Local Plan development in comparison to the background traffic volumes (forecast growth to 2034 only).

Table 6: 2034 Local Plan Growth Traffic Flows (#) and Comparison to 2034 Background Traffic Flows (%)

ID	Existing Junction	Total Junction Flows (#)		Change from Background Flows (%)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Basildon					
Ba1	Standard Roundabout	4,379	4,959	10%	14%
Ba2	Standard Roundabout	4,674	4,943	11%	12%
Ba4	Signal Roundabout	5,403	5,168	11%	17%
Ba5	Standard Roundabout	5,072	4,940	12%	12%
Ba7	Standard Roundabout	4,945	5,017	15%	22%
Ba14	Mini Roundabout	1,799	2,369	7%	10%
Ba15	Standard Roundabout	5,113	5,422	8%	11%
Ba16	Large Roundabout	3,856	3,821	30%	31%
Ba19	Standard Roundabout	2,875	2,895	10%	8%
Ba20	Standard Roundabout	1,736	2,030	8%	9%
Ba23	Signal Roundabout	3,522	3,416	12%	8%
Ba24	Standard Roundabout	3,970	4,278	13%	9%
Ba25	Standard Roundabout	2,955	2,785	15%	3%
Ba26	Large Roundabout	4,871	5,247	16%	21%
Ba27	Standard Roundabout	4,026	4,157	13%	20%
Ba28	Signal (4-arm)	2,493	2,810	17%	8%
Ba29	Standard Roundabout	3,224	3,291	14%	12%
Billericay					
Bi1	Standard Roundabout	2,706	2,681	3%	4%
Bi2	Mini Roundabout	1,584	1,482	1%	1%
Bi3	Standard Roundabout	2,677	2,720	4%	5%
Bi4	Signal (4-arm)	1,591	1,734	4%	1%
Bi5	Standard Roundabout	1,621	1,488	3%	4%
Bi6	Standard Roundabout	831	1,197	1%	4%
Bi7	Signal (4-arm)	1,574	985	13%	11%
Bi8	Standard Roundabout	1,080	1,975	1%	2%
Bi9	Standard Roundabout	1,670	1,241	2%	3%
Bi10	Priority (3-arm)	2,121	1,584	10%	8%
Bi12	Priority (3-arm)	1,588	1,591	6%	5%
Bi13	Priority (3-arm)	1,030	989	3%	2%
Wickford					
W1	Standard Roundabout	3,195	3,455	9%	13%
W2	Standard Roundabout	4,177	4,636	11%	14%

ID	Existing Junction	Total Junction Flows (#)		Change from Background Flows (%)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
W3	Priority (3-arm)	2,315	2,713	10%	17%
W4	Signal (4-arm)	2,674	2,993	12%	28%
W5	Standard Roundabout	3,453	3,193	15%	20%
Rochford					
Ra1	Standard Roundabout	3,976	4,391	-1%	1%

Table 6 above shows an average increase of 10-15% in flows within the Basildon and Wickford areas, while Billericay has a much lower average increase of 4-5% in flows. That said, there are certain areas that are subject to a much greater level of growth at particular junction locations, including Ba16 (increase of 30-31% in both peak hours), Bi7 (increase of 11-13% across the AM and PM peak hours) and W4 and W5 which show an increase in flows of 28% and 20% respectively in the PM peak hour.

Junction Model Results

Background

Table 8 below presents the junction modelling results for the sensitivity test scenario outlined above. They show weekday morning and afternoon peak hour saturation levels for the worst operating arm or movement at the thirty-five junctions, presented as the volume to capacity ratio (V/C) for each junction. Detailed analysis indicates that the worst arm or movements always involve significant (rather than insignificant) flows of traffic.

The saturation levels are categorised on a coloured system identified as red, amber, yellow or green with respect to the V/C ranges indicated in Table 7 below. Junctions with a maximum V/C at or over 1.00 on at least one or more arms for any or both peak hours are generally considered to be exceeding capacity and some form of physical (or operational mitigation) is usually needed. However, marginal capacity exceedances with values between 1.00 and 1.10, could be mitigated by other interventions, such as more ambitious sustainable modal shift, peak spreading or increased homeworking, which should be considered prior to implementing costly highway improvements or overproviding highway capacity. V/Cs of between 1.00 and 1.10 could simply be addressed, in many instances, by background traffic reductions due to assumed sustainable travel interventions. Sustainable travel shifts have only been applied to Local Plan traffic in this assessment.

Table 7: Junction Assessment Categorisation Ranges

Colour		V/C (RFC, DoS)
	Green denotes a junction with all approaches operating with a V/C ratio of under 0.85 - which suggests that the junction has sufficient spare capacity	<0.85
	Yellow indicates a junction with one or more approaches operating with a V/C ratio of between 0.85 and 1.00 - which suggests that the junction is nearing or at capacity	0.85-1.00
	Amber denotes a junction where one or more approaches is operating with a V/C ratio of between 1.00 and 1.15 – junction is operating just over capacity	1.00-1.15
	Red indicates a junction with one or more approaches operating with a V/C ratio of 1.15 or over – junction is operating significantly over capacity	>1.15
	Some red-coded junctions are denoted by an 'X', where an approach is so far over capacity a V/C cannot be realistically calculated	X

THIA March 2018 Assessment Comparison

It should be reiterated that the modelling results assume traffic demands generated using the same techniques and methodology as set out in the THIA March 2018 report. When undertaking a comparison to the previous THIA March 2018 results, the sensitivity scenario also assumes different broader highway assumptions, as well as Local Plan development numbers – more particularly, no proposed grade-separated junction where Pound Lane intersects with the A127 and additional circulation changes within Basildon Town Centre. The sensitivity test Local Plan scenario also assumes significantly different development assumptions from those in the THIA March 2018 assessment, particularly within Basildon Town Centre, where there is greater development, and Billericay, where there is slightly less development.

Furthermore, previously assumed local junction mitigation isn't necessarily suited to the new development traffic patterns, which are reflected in the results below. Indeed, in some instances, the proposed improvements show a worsening in junction performance in comparison to the existing junction layout.

Where required, updated junction mitigation has been tested at concept level to identify potential improvements suitable for the new development traffic patterns (to be followed up with detailed designs as planning progresses) including the sustainable mode shift assumptions discussed previously. Background traffic flows have not been adjusted for sustainable mode shift impacts and therefore offer some realistic scope for further traffic flow reductions.

Junction Model Assessment

The junction model results for the sensitivity test Local Plan scenario (with revised development numbers and associated sustainable trip rate adjustments) are presented in Table 8 below. The results are set out for the following junction layouts:

- No mitigation – the existing junction layout
- Previous mitigation – the junction mitigation previously proposed as part of the THIA March 2018 assessment
- Updated mitigation – the updated junction mitigation proposed as part of this sensitivity test assessment

Appendix C, which contains a table of extended modelling results, presents the THIA March 2018 results in addition to the sensitivity test results.

Table 8: Junction Model Results (V/C)

ID	Sensitivity Test 2034 Local Plan Scenario* No Junction Mitigation		Sensitivity Test 2034 Local Plan Scenario* THIA March 2018 Mitigation		Sensitivity Test 2034 Local Plan Scenario* Updated Mitigation	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Basildon						
Ba1	1.10	1.29	1.06	1.24	0.83	0.89
Ba2	0.76	0.82				
Ba4	0.96	0.93				
Ba5	1.64	1.04	1.19	0.91	1.01	0.80
Ba7	1.47	1.10			0.97	1.09
Ba14	1.14	1.43	1.40	2.49	0.43	0.72
Ba15	1.16	1.01			1.08	1.01
Ba16	0.83	0.92				
Ba19	0.95	0.86				
Ba20	0.43	0.56				
Ba23	0.95	0.95				
Ba24	0.86	1.45	2.44	1.27	0.79	0.84
Ba25	0.68	0.67	0.64	0.61		
Ba26	1.51	1.88	0.82	1.01		
Ba27	0.94	0.94				
Ba28	0.84	0.97				
Ba29	1.09	0.80				
Billericay						
Bi1	1.04	1.13			0.90	0.95
Bi2	0.79	0.70				
Bi3	0.85	0.97				
Bi4	0.73	0.71	0.52	0.63		
Bi5	0.69	0.66	1.02	0.97		
Bi6	0.40	0.65				
Bi7	0.83	0.49				
Bi8	0.46	1.06				
Bi9	0.56	0.53				
Bi10	0.76	0.30				
Bi12	1.02	0.79				

ID	Sensitivity Test 2034 Local Plan Scenario* No Junction Mitigation		Sensitivity Test 2034 Local Plan Scenario* THIA March 2018 Mitigation		Sensitivity Test 2034 Local Plan Scenario* Updated Mitigation	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Bi13	0.59	0.62	0.84	0.84		
Wickford						
W1	1.39	1.46			0.99	1.01
W2	1.17	1.31	1.20	1.39	0.93	0.95
W3	X	X			0.82	1.11
W4	1.12	0.99	0.92	0.75		
W5	0.82	0.98				
Rochford						
Ra1	0.79	1.07	0.79	0.86		

** With revised development numbers and associated sustainable trip rate adjustments.*

As shown in Table 8 above, one junction in the Billericay area (Bi1), seven junctions within the Basildon area (Ba1, Ba5, Ba7, Ba14, Ba15, Ba24, Ba26) and four junctions within the Wickford area (W1, W2, W3, W4) are significantly impacted by the proposed growth, and are operating with a V/C at or above 1.10 for the sensitivity test scenario, without mitigation. For the identified junction within Billericay, there is only an issue in the PM peak period where the junction operates with a V/C below 1.15 but over 1.10. For the identified junctions within Basildon, and Wickford, all but one junction (W4) operate significantly over capacity (i.e., with a V/C in excess of 1.15) in at least one peak period.

When the sensitivity test scenario was run with the previous THIA March 2018 assessment junction mitigation, a total of five junctions still operate significantly over capacity (i.e., with a V/C in excess of 1.15). The remaining seven junctions operate within sufficient (or mitigatable) capacity (i.e., with a V/C well below 1.10).

This required the sensitivity test scenario to be run with updated junction mitigation where the THIA March 2018 mitigation was proven inadequate. A total of ten junctions were proposed to either be mitigated with revised or additional mitigation junction improvements compared to that of the THIA March 2018. Three mitigation proposals from the THIA March 2018 assessment are proposed for potential removal as they are not needed for capacity reasons. However, it is possible that general traffic management or urban realm considerations argue for retaining the proposed mitigation scheme at one of the three junctions.

Table 9 below presents a summary of the junction model results for the final layouts whether they remain as existing or are improved through proposed mitigation.

Table 9: Final Junction Model Results (V/C) – Summary

ID	Final Junction Model Results	
	AM Peak Hour	PM Peak Hour
Basildon		
Ba1	0.83	0.89
Ba2	0.76	0.82
Ba4	0.96	0.93
Ba5	1.01	0.80
Ba7	0.97	1.09
Ba14	0.43	0.72
Ba15	1.08	1.01
Ba16	0.83	0.92
Ba19	0.95	0.86
Ba20	0.43	0.56
Ba23	0.95	0.95
Ba24	0.79	0.84
Ba25	0.64	0.61
Ba26	0.82	1.01
Ba27	0.94	0.94
Ba28	0.84	0.97
Ba29	1.09	0.80
Billericay		
Bi1	0.90	0.95
Bi2	0.79	0.70
Bi3	0.85	0.97
Bi4	0.73	0.71
Bi5	0.69	0.66
Bi6	0.40	0.65
Bi7	0.83	0.49
Bi8	0.46	1.06
Bi9	0.56	0.53
Bi10	0.76	0.30
Bi12	1.02	0.79
Bi13	0.59	0.62
Wickford		
W1	0.99	1.01
W2	0.93	0.95
W3	0.82	1.11
W4	0.92	0.75
W5	0.82	0.98
Rochford		
Ra1	0.79	0.86

Identified Mitigation Needs

The proposed mitigation was divided into the categories shown in Table 10 below to set out the level of 'action' required for each junction relative to the THIA March 2018.

Table 10: Proposed Mitigation Categories

Action Relative THIA March 2018	Description
Unchanged	No mitigation required
Remove	No mitigation required – previous THIA March 2018 mitigation measures proposed to be removed
Retain	Mitigation measures required – to be retained as the previous THIA March 2018 mitigation measures proposed
Revise	Mitigation measures required – revisions required to the previous THIA March 2018 mitigation measures proposed
Add	Mitigation measures required – additional mitigation required where this was not included in the previous THIA March 2018 mitigation measures proposed

Table 11 below presents the total list of junctions with their associated 'actions' and details of the proposed junction mitigation where relevant. Appendix D provides concept-level plans and sketches of the mitigation, while Appendix E provides the high-level cost estimates of the mitigation.

A132 Nevendon Road

The merge immediately southwest of junction W5 – Darby Digger Roundabout – wasn't accounted for in the local modelling. Inspection of 2014 and 2034 forecast flows on the A132 between junctions Ba4 and W5 confirmed that existing capacity issues associated with the westbound merge immediately southwest of junction W5 in the morning peak hour (blocking back into and undermining the operation of Darby Digger Roundabout) will worsen by 2034. There is likely to be a similar issue with the eastbound merge to the northeast of Ba4 as well in the afternoon peak hour. Accordingly, the dualling of the A132 between Ba4 and W5 probably ought to be considered to provide sufficient capacity into the future. Part of the dualling in each direction could incorporate bus lanes.

*Table 11: Proposed Mitigation Details**

ID	Existing Junction Layout	Proposed Action Relative Mitigation Proposed in THIA March 2018	THIA March 2018 Mitigation	Updated Mitigation
Basildon				
Ba1	Standard Roundabout	Revise	Signalisation at 3 of the 4 approaches (excluding the A176 Noak Hill Road) with peak time signals and road widening at the approaches on South Wash Road and A176 Upper Mayne, with the circulatory carriageway increasing from 2 lanes to 3 lanes.	Signalisation of all approaches and adjacent circulating lanes plus 3 lanes on circulatory carriageway and all approaches excluding the western arm and a 2 lane exit on the northern arm.
Ba2	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba4	Signal Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba5	Standard Roundabout	Revise	Road widening tested on St Nicholas Lane lengthening the existing two-lane approach, with the relocation of the staggered pedestrian crossing further back along the approach arm, and the removal of cross-hatching on the carriageway approach.	Signalisation of the western and southern approaches and adjacent circulating lanes.
Ba7	Standard Roundabout	Add	No mitigation previously proposed.	Widen South Mayne approach to 3 lane entry and provide 3 lane circulatory carriageway between South Mayne and Broadmayne arms (as set out in the Pound Lane Addendum, 2019).
Ba14	Mini Roundabout	Revise	Convert to a 3-arm signalised junction, with dual lane approaches proposed on each arm, with the controlled pedestrian crossings on each arm, to be run as an all-red pedestrian stage.	Convert to a standard roundabout with two lanes on all approaches (as proposed for the proposed signalised junction tested in the previous mitigation).
Ba15	Standard Roundabout	Add	No mitigation previously proposed.	Widen 3 lane East Mayne southern approach to 3.5m per lane (as set out in the Pound Lane Addendum, 2019).
Ba16	Large Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba19	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba20	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba23	Signal Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba24	Standard Roundabout	Revise	Partial signalisation (with peak time signals) on the A13 eastbound off slip and A176 Upper Mayne approaches, with a dedicated uncontrolled filter lane to bypass the proposed A13 off slip. Relocation of the pedestrian crossing on the A13 off slip (20m back from the junction) to the new signal stop line as an uncontrolled crossing to accommodate the filter lane.	Signalisation of the northern approach and adjacent circulating lanes, with two lane exit on the northern and eastern arms and three lane approach on the northern arm.
Ba25	Standard Roundabout	Retain	Convert to signalised roundabout, with a signal-controlled approach on the A13 exit only, and the closure of the northern section of roundabout circulatory carriageway to create a 'teardrop' design.	To retain previous mitigation proposed (as detailed in adjacent column).
Ba26	Large Roundabout	Retain	Convert to signalised roundabout, with all arms and their respective	To retain previous mitigation proposed (as detailed in adjacent

ID	Existing Junction Layout	Proposed Action Relative Mitigation Proposed in THIA March 2018	THIA March 2018 Mitigation	Updated Mitigation
			sections of the circulatory carriageway to be signal controlled at peak times. An uncontrolled crossing point is proposed on the westbound A13 off slip and improved lane markings should be investigated on the circulatory carriageway adjacent to A132 South Mayne.	column).
Ba27	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Ba28	Signal (4-arm)	Unchanged	The mitigation scheme previous proposed has now been completed, and therefore has been tested as the existing layout instead.	No new mitigation proposed.
Ba29	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Billericay				
Bi1	Standard Roundabout	Add	No mitigation previously proposed.	Convert to signalised crossroads.
Bi2	Mini Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi3	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi4	Signal (4-arm)	Remove	Implementation of an eastbound one-way restriction on Norsey Road for approximately 250m from the junction up to Highland Grove. Former westbound traffic on Norsey Road will be able to reroute via St Andrews Drive and Stock Road to the west. Road widening on Western Road is also proposed, extending the 2-lane approach from approximately 10m to 35m in length.	No new mitigation proposed. Previously proposed mitigation may still be warranted from an urban realm and traffic management perspective.
Bi5	Standard Roundabout	Remove	Convert to a 4-arm signalised junction (with optimised signal timings), incorporating all turning movements permitted under the existing layout, with two lanes on the approaches/exits for the A129 London Road east-west movements.	No new mitigation proposed.
Bi6	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi7	Signal (4-arm)	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi8	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi9	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi10	Priority (3-arm)	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi12	Priority (3-arm)	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Bi13	Priority (3-arm)	Remove	Signalisation of the 3-arm priority junction, with the addition of a controlled pedestrian crossing at each arm to be run as an all-red pedestrian stage (to replace existing zebra crossings).	No new mitigation proposed.

ID	Existing Junction Layout	Proposed Action Relative Mitigation Proposed in THIA March 2018	THIA March 2018 Mitigation	Updated Mitigation
Wickford				
W1	Standard Roundabout	Add	No mitigation previously proposed.	Part-time signalisation of A132 Golden Jubilee Way (as set out in the Pound Lane Addendum, 2019)**
W2	Standard Roundabout	Revise	Minor alterations to widen the existing two-lane northern approach on A132 Golden Jubilee Way to provide a third left turn only lane and reduce the central island to provide a straighter alignment across the junction and increased circulatory capacity.	Signalisation of the southern approach and adjacent circulating lanes.
W3	Priority (3-arm)	Add	No mitigation previously proposed.	Convert to signalised junction with a short lane for right turn movements from Runwell Road (northeast) to Church End Lane (northwest). Signal phasing to allow left turn out of Church End Lane to run with right turn movement from Runwell Road (north) to Church End Lane. ***
W4	Signal (4-arm)	Retain	Minor alterations to include widening the eastbound A129 London road to lengthen the two-lane approach, the westbound A129 London Road approach has ahead manoeuvre moved from left lane to right lane and the pedestrian island has been reduced to improve alignment.	To retain previous mitigation proposed (as detailed in adjacent column).
W5	Standard Roundabout	Unchanged	No mitigation previously proposed.	No new mitigation proposed.
Rochford				
Ra1	Standard Roundabout	Retain	A dedicated north to east filter lane from A1245 Chelmsford Road to A129 London Road east, with improved road markings, a third lane on A1245 Chelmsford Road south and extension of the two-lane approach A129 London Road west.	To retain previous mitigation proposed (as detailed in adjacent column).

** This sensitivity test acknowledges but does not incorporate the conclusions or recommendations of engineering reports which focus on potential improvements required in the vicinity of the Pound Lane junction or to support the proposed Local Plan development sites for reasons other than capacity (e.g., safety-related improvements). Furthermore, because a separate package of improvement measures is being considered at Ba30 – Sadlers Farm Roundabout – separate to Local Plan mitigation it has not been taken through for further modelling as part of this sensitivity test assessment.*

*** For junction W1, an alternative scheme was reviewed (also provided in the Pound Lane Addendum), which proposed the redesign of the existing roundabout to provide space for a filter lane accommodating movements from Runwell Road south to north. This scheme was considered to provide longer-term capacity improvement compared with part-time signalisation of the roundabout, but was shown to be significantly more expensive without yielding additional capacity benefits.*

**** The 2019 Pound Lane Addendum work tested a mini roundabout at this junction. While an improvement over the existing junction, a mini-roundabout still operated markedly over capacity without the A127 grade-separated junction improvements. The October 2020 review of the same junction noted that a mini roundabout also disadvantages flows along the A132. The proposed signalisation will allow A132 movements to be protected but will still operate well over capacity, raising questions over the practicality of implementing signalisation. As the October 2020 review of the junction notes, greater emphasis needs to be placed on the impact of improved sustainable transport links and peak spreading on flows through the junction.*

Mitigation Summary

The THIA March 2018 assessment proposed mitigation at twelve out of a total of thirty-five junctions. The new modelling suggests mitigation at fourteen out of a total of thirty-five junctions would be appropriate for the revised sensitivity test scenario growth and distribution, as summarised below. The following summarises the findings relative to the THIA March 2018 findings. Figure 2 illustrates the below.

Remove (i.e., relative THIA March 2018)

- The mitigation proposed in the THIA March 2018 assessment at two junctions – Bi5 and Bi13 – is no longer required from a capacity perspective.
- The mitigation proposed in the THIA March 2018 assessment at one junction – Bi4 – is not, as then, necessary from a capacity perspective. However, it may be retained for broader traffic circulation and urban realm considerations.

Retain

- The mitigation proposed in the THIA March 2018 assessment at four junctions – Ba25, Ba26, W4 and Ra1 – is retained as was previously proposed, with no further changes required.

Revise

- The mitigation proposed in the THIA March 2018 assessment at five junctions – Ba1, Ba5, Ba14, Ba24 and W2 – needs revision.

Add

- New mitigation is proposed at five junctions – Ba7, Ba15, Bi1, W1 and W3 – where mitigation was not previously proposed in the THIA March 2018 assessment.

Unchanged

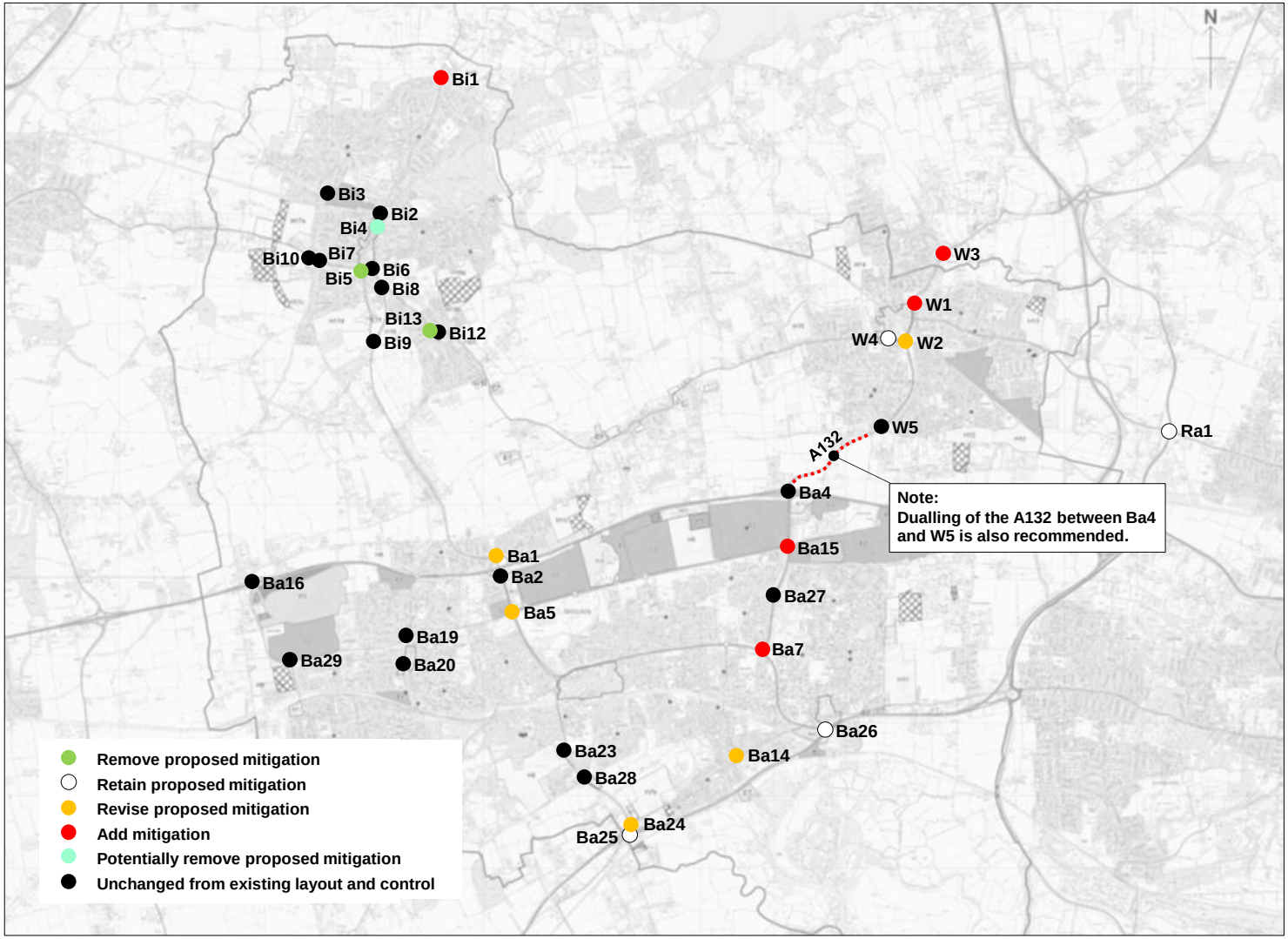
- No mitigation is required at the remaining eighteen junctions, as was also concluded in the previous THIA March 2018 assessment.

A132 Nevendon Road

The dualling of the A132 between Ba4 and W5 should also be considered in addition to the above junction improvements to provide sufficient capacity into the future. Part of the dualling in each direction could incorporate complementary bus lanes to further promote sustainable transport options.

It should be reiterated that this sensitivity test specifically assesses junction capacity and does not incorporate the conclusions or recommendations of other engineering reports, which focus on other potential design improvements, e.g., safety at locations in the vicinity of the Pound Lane junction or general support for the proposed Local Plan development sites.

Figure 2: Local Junction Mitigation Conclusions



Conclusions and recommendations

The conclusions of the sensitivity test modelling include the following:

- **11 junctions** – Ba2, Ba20, Ba27, Bi2, Bi4, Bi5, Bi6, Bi7, Bi9, Bi10 & Bi13 – present no concerns in terms of forecast traffic impacts. No improvement of existing layouts is required.
- The proposed junction mitigation at **8 junctions** – Ba1, Ba14, Ba24, Ba25, Bi1, W2, W4 & Ra1 – resolves the new forecast traffic impacts.
- The existing layouts at **7 junctions** – Ba4, Ba16, Ba19, Ba23, Ba28 (improved since 2018), Bi3 & W5 – acceptably cope with forecast traffic impacts.
- A reduction in background traffic due to travel changes in favour of more sustainable travel options is expected to mitigate forecast traffic impacts at **5 junctions** – Ba5, Ba26, Ba29, Bi12 & W1 – so that they operate within capacity. Mitigation is proposed at junctions Ba5, Ba26 and W1.
- A reduction in background traffic due to travel changes in favour of more sustainable travel options should mitigate forecast traffic impacts at **3 junctions** – Ba7, Ba15 & Bi8. Mitigation is proposed at junctions Ba7 and Ba15.
- There is an outstanding issue at **1 junction** – W3 – which operates at a V/C above 1.10 with proposed mitigation.
- The **dualling** of the A132 between Ba4 and W5 should be considered to provide sufficient capacity into the future. Part of the dualling in each direction could incorporate bus lanes.

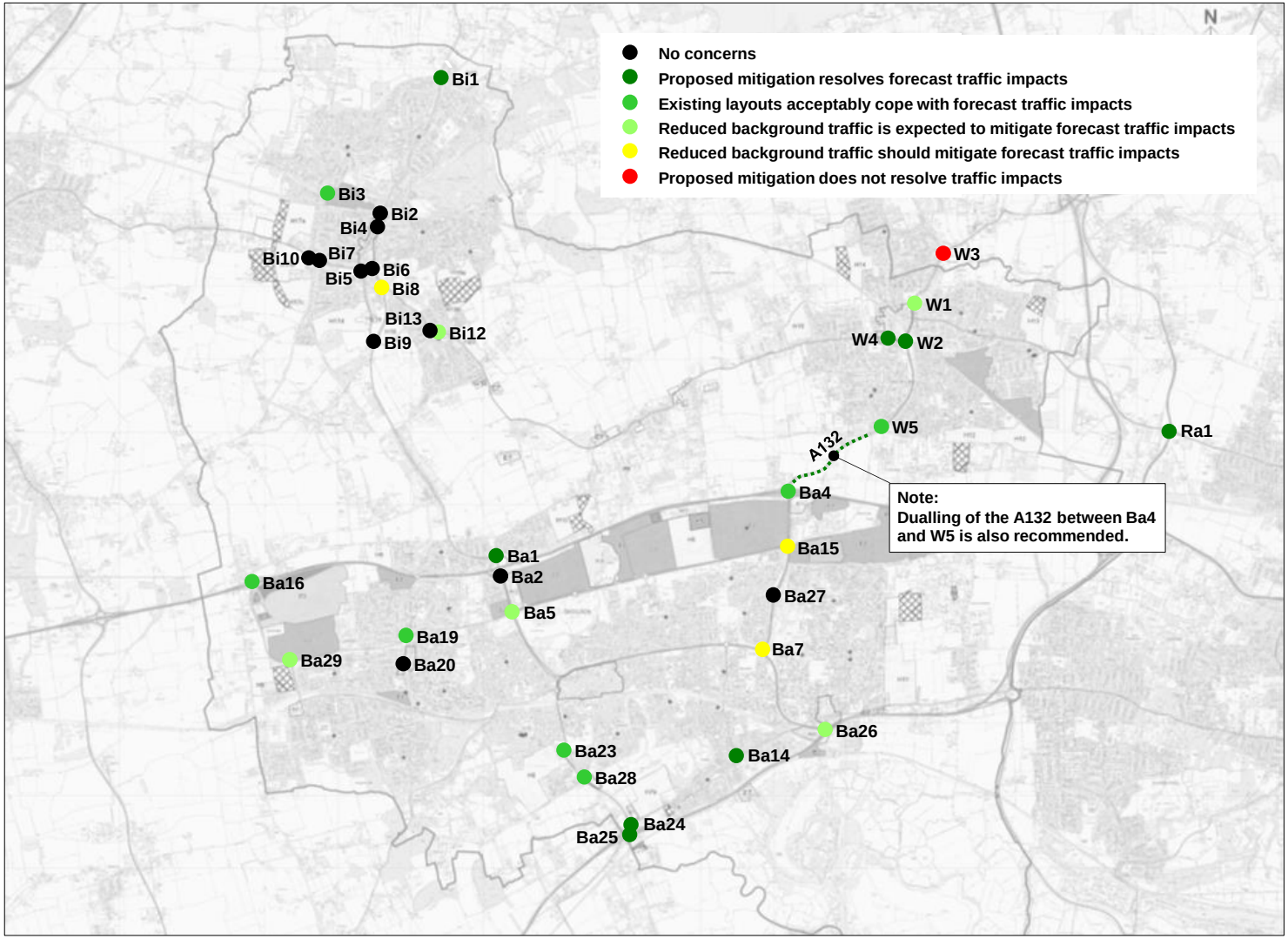
Overall, all but one of the junctions with mitigation measures operate at or under a maximum V/C of 1.10. The exception is junction W3 (A132 Runwell Road / Church End Lane).

While V/Cs greater than 1.00 reflect over-capacity conditions, the mitigation measures result in significant improvements in junction performance. Furthermore, reductions in background traffic flows as a result of sustainable mode shift impacts offer scope for reduced saturation levels operating nearer or even below V/Cs of 1.00.

Mitigation solutions previously proposed at the W3 junction in related studies have been reviewed in detail. The mitigation proposed in this sensitivity test is considered the most effective mitigation that could realistically be provided given local constraints. However, since the junction performs quite close to the 1.10 V/C threshold and there is potential for further background traffic reductions with more sustainable travel, the proposed mitigation is considered a proportionate and acceptable solution to accommodate Local Plan demands (see note below Table 11 for more information on previous findings).

These conclusions and recommendations are illustrated in Figure 3.

Figure 3: Local Junction Performance



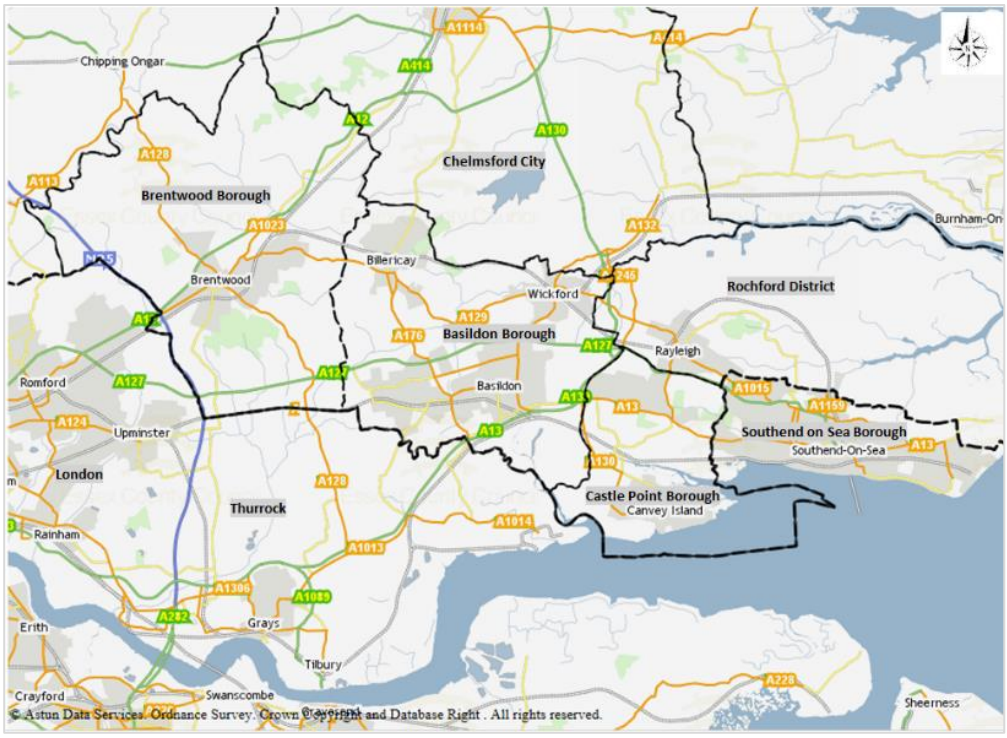
6 Cross-Boundary Impacts

Introduction

The previous sections of this report focus on the internal impacts of the revised Local Plan development within the Basildon Borough. This section provides a high-level review of the forecast cross-boundary trips and effects generated by the revised Local Plan with surrounding boroughs, districts and unitary authorities.

Figure 4 below shows the neighbouring borough, districts and unitary authorities.

Figure 4: Basildon's Neighbouring Boroughs & Districts



The appraisal of cross-boundary impacts focused on the following four highway links and neighbouring local authorities:

- B1007 in Stock – Chelmsford County Council
- A130 – Chelmsford City Council
- A127 – Brentwood Borough Council, Southend Unitary Authority & Rochford District Council

- A13 – Thurrock Unitary Authority, Southend Unitary Authority & Castle Point District Council

Cross-boundary impacts on these highway links were determined using the 2034 revised Local Plan growth scenario development assignments (from the VISUM network model) and the DfT traffic counts assembled for the THIA March 2018 assessment. The trip generation methodology and application of TEMPro background growth rates account for an element of trip generation/attraction to and from areas outside of the Borough. External impacts are therefore partially accounted for.

Identified Impacts

Potential cross-boundary impacts of the revised Local Plan growth at each of the network locations assessed are shown in Table 12 below.

Table 12: Cross Boundary Traffic Flows and Percentage Increases

Location	2034 Background Growth Two-Way Flows		2034 Final Growth Two-Way Flows		Flow Increase Over 2034 Background Flows (%)			
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour	
B1007 Chelmsford	1,684	1,722	1,732	1,809	+48	2.9%	+87	5.1%
A130 Chelmsford	3,609	3,604	4,023	4,085	+414	11.5%	+481	13.3%
A127 Brentwood	5,726	5,698	6,582	6,613	+856	14.9%	+915	16.1%
A13 Thurrock	5,381	5,401	6,139	6,298	+758	14.1%	+897	16.6%

The results show significant increases in traffic with Local Plan growth above 2034 background flows along the A130 corridor towards Chelmsford, the A127 corridor towards Brentwood, and the A13 corridor towards Thurrock, in both percentage increase and absolute flow change. The increases in traffic on the B1007 towards Chelmsford are relatively modest.

Three of the four traffic flow increases more-or-less compare with the THIA March 2018 assessment. However, the traffic flow increase on the A127 corridor towards Brentwood is substantially reduced compared to the THIA March 2018 assessment (where the flow increases were 24% and 25% in the AM and PM peak hours respectively).

Table 12 only summarises the outcomes of the modelling work developed to support the Basildon Revised Publication Local Plan.

7 Summary

Section 5 of the report presents the modelling results and conclusions of the sensitivity test modelling.

For convenience, the conclusions are re-iterated below:

- **11 junctions** – Ba2, Ba20, Ba27, Bi2, Bi4, Bi5, Bi6, Bi7, Bi9, Bi10 & Bi13 – present no concerns in terms of forecast traffic impacts. No improvement of existing layouts is required.
- The proposed junction mitigation at **8 junctions** – Ba1, Ba14, Ba24, Ba25, Bi1, W2, W4 & Ra1 – resolves the new forecast traffic impacts.
- The existing layouts at **7 junctions** – Ba4, Ba16, Ba19, Ba23, Ba28 (improved since 2018), Bi3 & W5 – acceptably cope with forecast traffic impacts.
- A reduction in background traffic due to travel changes in favour of more sustainable travel options is expected to mitigate forecast traffic impacts at **5 junctions** – Ba5, Ba26, Ba29, Bi12 & W1 – so that they operate within capacity. Mitigation is proposed at junctions Ba5, Ba26 and W1.
- A reduction in background traffic due to travel changes in favour of more sustainable travel options should mitigate forecast traffic impacts at **3 junctions** – Ba7, Ba15 & Bi8. Mitigation is proposed at junctions Ba7 and Ba15.
- There is an outstanding issue at **1 junction** – W3 – which operates at a V/C above 1.10 with proposed mitigation.
- The **dualling** of the A132 between Ba4 and W5 should be considered to provide sufficient capacity into the future. Part of the dualling in each direction could incorporate bus lanes.

Overall, all but one of the junctions with mitigation measures operate at or under a maximum V/C of 1.10. The exception is junction W3 (A132 Runwell Road / Church End Lane).

Mitigation solutions previously proposed at the W3 junction in related studies have been reviewed in detail. The mitigation proposed in this sensitivity test is considered the most effective mitigation that can realistically be provided given local constraints. However, since the junction performs quite close to the 1.10 V/C threshold and there is potential for further background traffic reductions with more sustainable travel, the proposed mitigation is considered a proportionate and acceptable solution to accommodate Local Plan demands.

While V/Cs greater than 1.00 reflect over-capacity conditions, the mitigation measures result in significant improvements in junction performance. Furthermore, reductions in background traffic flows as a result of sustainable mode shift impacts offer scope for reduced saturation levels operating nearer or even below V/Cs of 1.00.

Appendices

Appendix A: Development Summary

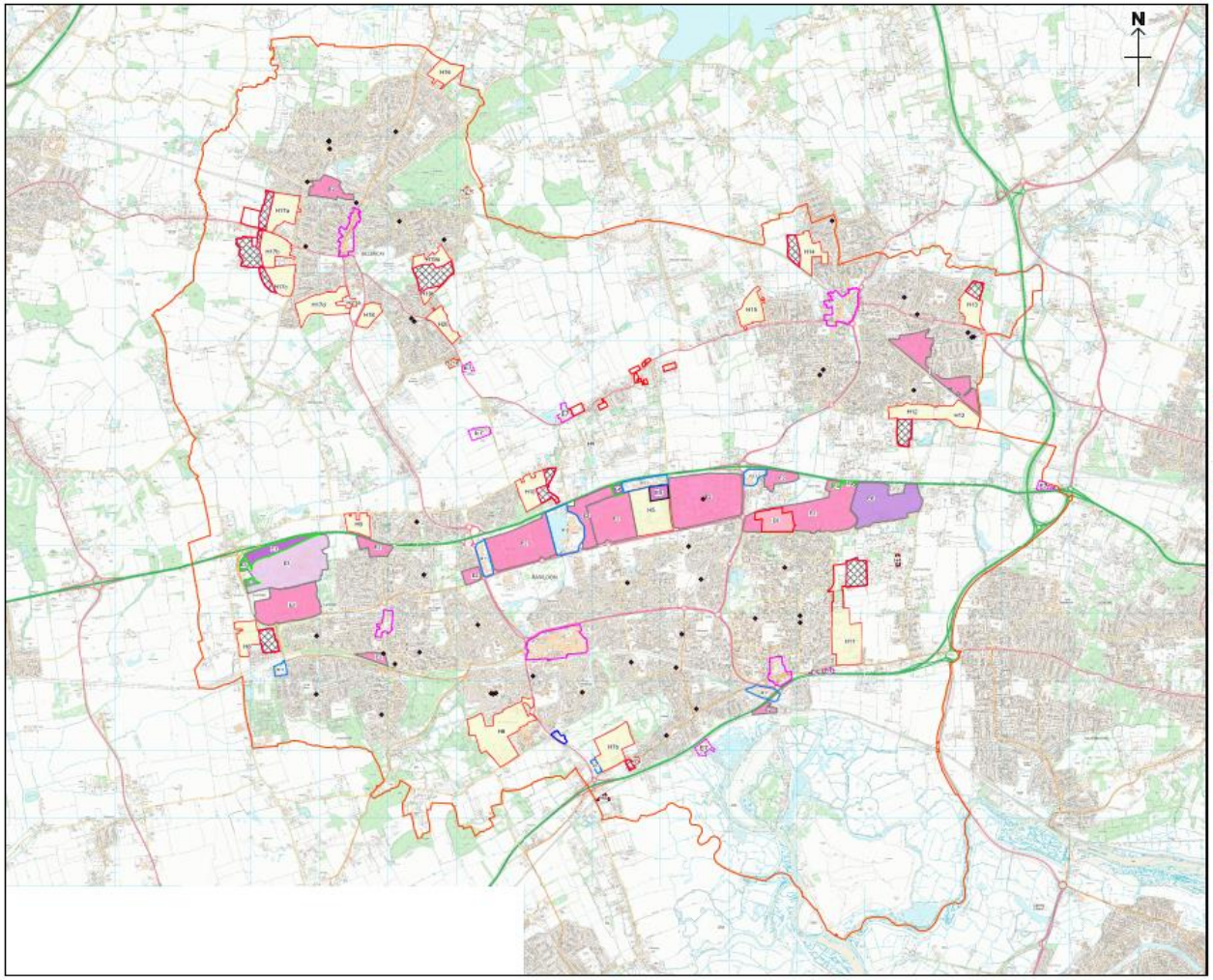
Site Ref	Address:	Town	Site Housing Yield:
SS0064	Land east of Pound Lane, Laindon	Basildon	20
SS0063	Land on corner of Pound Lane and Arterial Road, Laindon	Basildon	9
SS0069	Open Space and garages at rear of 1-53 Paprills, 318-334 Great Gregorie and 156-184 The Knares, Lee Chapel South	Basildon	20
SS0076	Land North of Nethermayne, South of 35 Toucan Way, including car park and outbuildings at Basildon Golf Course	Basildon	13
SS0087	Open Space and garages at rear of 2-12 Priors Close, 94-114 Pinmill and 442-510 Long Riding, Barstable	Basildon	8
SS0090	Basildon Integrated Support Service (Lincewood County Infants School Annexe) High Road, Langdon Hills	Basildon	16
SS0096	Land at corner of Mandeville Way and West Mayne/North of 75-92 Menzies Avenue, Laindon	Basildon	15
SS0105	Ashleigh Centre & Fryerns Library, Whitmore Way	Basildon	35
SS0107	Land at Long Riding, north of Napier Close, Barstable	Basildon	89
SS0108	Open Space opposite 113-151 Church Road and South of Fairhouse County Primary School, Vange	Basildon	55
SS0118	Open Space, North of 59-67 Bardfield and adjacent to 37-45 Bardfield, Vange, Basildon	Basildon	12
SS0120	Open Space at rear of 26-54 Dencourt Crescent and rear of 34-54 The Greensted, Barstable, Basildon	Basildon	16
SS0122	Open Space between 5-25 and 83 Meredene and 37-59 Stagden Cross, Barstable, Basildon	Basildon	16
SS0139	Open Space to the rear of 22-30 The Fold and opposite 24-30 Honeypot Lane, Fryerns	Basildon	5
SS0147	Land at Parklands, rear of 5-29 Parkside, Northlands	Basildon	10
SS0182	Land adjacent to the south side of Cranes Farm Road, Basildon, from Ghyllgrove to the field of Pendle Drive/ Pendle Close	Basildon	39
SS0691	Land at Menzies Avenue and Fraser Close, Basildon SS15 6SX	Basildon	26
SS0678	Pound Lane Central, Basildon SS15 4EX	Basildon	4
SS0693	Pounders Hall, Pound Lane, Basildon SS15 5SP	Basildon	28
SS0685	Garages at Woolmer Green, Basildon SS15 5LL	Basildon	8
SS0696	Garages located at Great Knightleys and Swan Close, Basildon SS15 5GE	Basildon	7
SS0697	Garages located at Little Lullaway, Basildon SS15 5JH	Basildon	7
SS0698	Garages to the south of 13 Falstones, Basildon SS15 5BU	Basildon	6
SS0699	Garages to the north of 84 Falstones, Basildon SS15 5BX	Basildon	5
SS0700	Garages to the north of 108 Falstones, Basildon SS15 5DF	Basildon	10
SS0701	Garages to the north of 86 Paprills, Basildon SS16 5QX	Basildon	10
SS0705	Garages to the south of 11 Culverdown, Basildon SS14 2AL	Basildon	7
SS0689	St Chad's Church, Clay Hill Road, Basildon	Basildon	28
SS0680	Glenmere, Basildon SS16 4QR	Basildon	7
SS0681	Littlethorpe, Basildon SS16 4LH	Basildon	13
SS0695	Garages located at Downey Close, Basildon SS14 2NF	Basildon	6
SS0706	Garages to the north of 87 Nether Priors, Basildon SS14 1LS	Basildon	7
SS0710	Land at Fairlop Gardens, Basildon	Basildon	10
SS0679	Rayside, Basildon SS14 1NB	Basildon	7
SS0684	Swan Mead Centre, Church Road, Basildon SS16 4AG	Basildon	15
SS0707	Garages to the west of 85 Great Mistley, Basildon SS16 4BE	Basildon	10
SS0690	Bower Lane, Basildon SS14 3PQ	Basildon	5
SS0694	Land west of Burnt Mills Road and east of East Mayne, Basildon SS13 1RF	Basildon	20
SS0692	Littlebury Green, Basildon SS13 1RF	Basildon	21
SS0708	East of Northlands Park, Basildon	Basildon	24
SS0682	Pitsea Housing Office/The Place, Northlands Pavement, Basildon SS13 3DU	Basildon	26
SS0683	Land east of Paslowes, Basildon SS16 4LS	Basildon	9
SS0704	Garages north and west of 1 Cadogan Terrace, Basildon SS13 2BD	Basildon	11
n/a	Crooked Brook	Basildon	5
n/a	Bells Hill Road / Hawkesbury Bush Lane	Basildon	3
n/a	Bells Hill Road / Leonard Road	Basildon	2
n/a	Stormont Way Infill area	Basildon	-
n/a	Northlands Infill area	Basildon	3
n/a	North Benfleet Infill area	Basildon	34
BAS/0045/12	Leighton Dunton Road Laindon	Basildon	1
BAS/0137/15	82A Railway Approach, Laindon, Essex	Basildon	3
BAS/0952/13	Winifred, Windsor Road, Bowers Gifford, North Benfleet	Basildon	1
BAS/1376/11	Land To The Rear Of 83, Pound Lane, Laindon, Basildon	basildon	3
BAS/0048/13	The Old Rectory, Church RoadBowers Gifford, BasildonSS13 2HG	Basildon	- 1
BAS/0063/12	25 Brackendale Avenue, Pitsea	Basildon	1
BAS/0090/13	2 The Mead, Laindon, Basildon	Basildon	1
BAS/0395/15	Land Adjacent To 124 Chesterford GreenBasildon	Basildon	1
BAS/0523/09	7 Tenterfields, Pitsea.	Basildon	4
BAS/0998/12	Adj 1 Clay Hill Road, Basildon.	Basildon	2
BAS/1065/12	Land South of Felmores, Northlands Park, Basildon.	Basildon	25
BAS/1239/12	49A Kirby Road, Basildon.	Basildon	2
BAS/1370/11	Land At Russell Close Laindon	Basildon	6
BAS/0778/13	Land To The Rear Of 83 Pound Lane Laindon	Basildon	3
BAS/0689/16	Land between Bramley & Longdene, Dunton Road, Basildon	Basildon	1
BAS/0052/14	61 Kings Road, Laindon, Basildon	Basildon	1
BAS/0658/13	29 Osier Drive, Basildon	Basildon	1
BAS/0227/15	Black Horse House, Bentalls, Basildon	Basildon	28
BAS/0315/14	75 Whitmore Way, Basildon	Basildon	1
BAS/1169/13	Land adjacent 271 Whitmore Way, Basildon	Basildon	1
BAS/1238/12	311 Church Road, Basildon	Basildon	3
BAS/0312/14	93 Pound Lane, Laindon, Basildon	Basildon	1
BAS/0869/10	Ashtons, High Road, Laindon	Basildon	4
BAS/0560/12	Dunton Hall, Church Road, Dunton	Basildon	1
BAS/0731/16	90 Railway Approach, Laindon	Basildon	4
BAS/0273/14	41 Bedford Road, Laindon	Basildon	1
BAS/0401/14	14 Basildon Drive, Basildon	Basildon	1
BAS/1108/13	Land at Fallowfield, Grays Avenue, Langdon Hills, Basildon	Basildon	2
BAS/0513/14	57 Russetts, Langdon Hills, Basildon	Basildon	1
BAS/0474/13	Land north of Tesco, Mandeville Way	Basildon	20
BAS/0411/14	Land west of High Warren, Lee Chapel Lane, Langdon Hills	Basildon	4
BAS/0012/07/REM	125 & 129 Gt Berry Lane, Basildon	Basildon	2
BAS/1490/15	Nevendon Hall Nevendon RoadBasildonEssexSS13 1BX	Basildon	1
BAS/1053/13	Land at The Triangle, Basildon	Basildon	5
BAS/1119/13	Land at Falstones, Laindon	Basildon	5
BAS/0643/00	40 Trindehay	Basildon	3
BAS/1213/04	Marsh Farmhouse, Marsh Farm, Brickfield Road, Basildon	Basildon	1
BAS/1454/16	Site of 70-77 Bockingham Green, Basildon	Basildon	6
BAS/0923/14	67 Great Ranton, Pitsea	Basildon	1
BAS/1196/14	15 Plumleys, Pitsea	Basildon	1
BAS/0601/14	1 Plumleys Pitsea	Basildon	1
BAS/1313/14	299 Pound Lane, Pitsea	Basildon	1
BAS/0728/01	221 Pound Lane	Basildon	1
BAS/0516/14	15 Delhi Road, Basildon	Basildon	1
BAS/0039/15	3 Rectory Road, Pitsea	Basildon	1
BAS/0492/13	Tudor Chambers, Station Lane, Pitsea	Basildon	4
BAS/0784/11	218 Pound Lane, Bowers Gifford	Basildon	4
BAS/1382/14	11 East Square, Basildon	Basildon	10
BAS/0098/13	The Dental Surgery, 11 Southview Road, Vange	Basildon	4
BAS/0152/13	3 St Teresa's Close, Basildon	Basildon	5
BAS/1576/15	Land to the east of 24 St Teresa's Close, Basildon	Basildon	2
BAS/0083/13	533 Clay Hill Road, Basildon	Basildon	2
BAS/0819/15	14 Quendon RoadBasildonEssexSS14 3PD	Basildon	4
BAS/1116/15	Garages South Of No. 70Victoria RoadLaindonEssex	Basildon	4
BAS/1179/15	22 Roberts RoadLaindonBasildonSS15 6AY	Basildon	10
BAS/1454/15	95 Pound LaneLaindonEssexSS15 5SP	Basildon	1
BAS/0657/16	35 Somerset RoadLaindonBasildonSS15 6PE	Basildon	1
BAS/1066/16	CatherineCromer AvenueLaindonEssexSS15 6HU	Basildon	2
BAS/1070/15	185 Great Berry LaneLangdon HillsBasildonSS16 6BS	Basildon	1
BAS/1134/16	Youth CentreLong LynderswoodBasildonEssexSS15 5AU	Basildon	20
BAS/1754/16	9 The GladeKingswoodBasildonEssexSS16 5JE	Basildon	1
BAS/0611/15	Northgate House High Pavement Basildon Essex SS14 1EA	Basildon	87
BAS/0031/16	The Icon SouthernhayBasildonEssexSS14 1FG	Basildon	6
BAS/1022/16	Land Adjacent ToDengayneBasildonEssex	Basildon	5

Site Ref	Address:	Town	Site Housing Yield:
BAS/1318/16	Eastgate Business CentreSouthernhayBasildonEssexSS14 1EB	Basildon	2
BAS/0062/15	210 Clay Hill RoadBasildonEssexSS16 4AA	Basildon	2
BAS/0742/16	9 Kelly Road, Bowers Gifford	Basildon	1
BAS/1321/16	43 High Road NorthLaindonEssexSS15 4DH	Basildon	3
BAS/0239/17	42 Pound Lane CentralLaindonBasildon	Basildon	5
BAS/0189/15	Formerly Tower RadioHigh RoadVangeEssexSS16 4TG	Basildon	10
BAS/0464/15	55 Edinburgh WayPitseaBasildonSS13 3RL	Basildon	1
BAS/1180/15	166 Rectory RoadPitseaEssexSS13 2AN	Basildon	2
BAS/1414/15	Junction Of Pound LaneOsborne RoadBowers GiffordBasildonEssex	Basildon	1
BAS/1051/15	302 Noak Hill RoadLaindonBasildonEssexSS15 4DE	Basildon	3
SS0168	Open Space, Community Hall and garages, r/o 3-83 Langham Crescent, Great Burstead	Billericay	15
SS0020	Land adjacent to 26 The Mount, Billericay	Billericay	15
SS0189	Maitland Lodge, Southend Road, Great Burstead	Billericay	28
SS0387	Land south of 115 Laindon Road, Billericay	Billericay	20
n/a	Green Lane, Little Burstead	Billericay	4
n/a	Broomhills Chase, Little Burstead	Billericay	6
SS0221	Land adjacent to Copper Beeches, Orchard Avenue	Billericay	2
SS0223	Land south of Ramsden Park Road	Billericay	7
SS0481	Adjacent Cassetta, Land East of Orchard Avenue, Ramsden Bellhouse	Billericay	2
SS0222	Land adjacent to Sliverwood Lodge, Orchard Avenue, Ramsden BellHouse	Billericay	1
SS0482	Land along the end of Orchard Avenue, Ramsden Bellhouse	Billericay	2
SS0634	Land at Church Road, south of Lorna Doone, Ramsden Bellhouse, Billericay	Billericay	6
SS0531	Land east of Church Road, Ramsden Bellhouse	Billericay	16
SS0599	Land at Ramsden Park Farm	Billericay	3
SS0505	Rear of Barnsfield	Billericay	12
SS0606	Land north of London Road (west of Bean End Cottage)	Billericay	12
SS0662	Land north of Southend Road, Crays Hill	Billericay	16
SS0319	Land between London Road and Corner Road, Crays Hill	Billericay	10
SS0320	Land opposite South Lodge, Approach Road, Crays Hill	Billericay	2
SS0321	Land east of South Lodge, Approach Road, Crays Hill	Billericay	7
SS0605	Land east of Corner Road	Billericay	2
SS0607	Land north of London Road (east of Annawest)	Billericay	3
SS0192	Land rear of, and including, Ravenscroft and Saremma, Gardiners Lane North, Crays Hill	Billericay	4
SS0456	Land at South Lodge, Southlands Road, Crays Hill	Billericay	5
SS0608	Land north of London Road (east of Hughendon)	Billericay	8
n/a	Crays Hill Infill Area	Billericay	23
BAS/0016/13	Rear of 69 High Street Billericay Essex CM12 9AU	Billericay	5
BAS/0236/17	14 Bromfelde Road, Crays Hill, Billericay	Billericay	1
BAS/0961/13	Land Adjacent To Whites Bridge Cottage, Crays Hill, Billericay	Billericay	2
BAS/0224/12	1 Chapel Street, Billericay.	Billericay	3
BAS/0362/12	70 Norsey Road, Billericay.	Billericay	2
BAS/0640/11	Land at Uplands, Chantry Way, Billericay, CM11 2AP	Billericay	4
BAS/0911/12	52 Chapel Street, Billericay.	Billericay	2
BAS/1087/11	Chestnuts Service Garage Crays Hill, Billericay	Billericay	3
BAS/0046/11	Elizabeth Cottages, 4 High Street, Billericay.	Billericay	3
BAS/0080/15	20B High Street Billericay	Billericay	1
BAS/0486/16	428 Outwood Common Road	Billericay	1
BAS/0704/12	Walman Huse, St Ediths Court, Billericay	Billericay	20
BAS/0014/13	62 Chestnut Avenue, Billericay	Billericay	1
BAS/0680/14	16 Hillside Road, Billericay	Billericay	3
BAS/0708/14	112 Norsey Road, Billericay	Billericay	1
BAS/0934/14	Land at Britannia Close, Billericay	Billericay	6
BAS/0111/14	17 Potash Road, Billericay	Billericay	1
BAS/1004/13	103 Norsey Road, Billericay	Billericay	1
BAS/1225/13	Link House, 1st & 2nd Floor, 56-70 High Street Billericay	Billericay	10
BAS/1132/13	Unit 1 King George's Court, High Street, Billericay	Billericay	3
BAS/0224/14	Rear of 195 & 197 Mountnessing Road, Billericay	Billericay	1
BAS/0468/15	1A Lake Avenue, Billericay	Billericay	3
BAS/0300/14	27 Tylers Avenue, Billericay	Billericay	1
BAS/1122/14	5 Stock Road, Billericay	Billericay	5
BAS/0223/14	The Anchorage, Buckwyns Chase, Billericay	Billericay	1
BAS/0117/14	1 Station Court, Radford Way, Billericay	Billericay	6
BAS/0750/15	Adj 1 Fairview, Billericay	Billericay	1
BAS/0168/15	Noak Hill Golf Course, 187 Noak Hill Road, Billericay	Billericay	3
BAS/0702/98	47 Laindon Road	Billericay	1
BAS/0843/13	1 Frithwood Lane, Billericay	Billericay	1
BAS/0456/15	120 Grange Road, Billericay	Billericay	1
BAS/0243/14	12 Patricia Gardens, Billericay	Billericay	6
BAS/0611/14	69 Church Street, Billericay	Billericay	1
BAS/0648/13	16 The Avenue, Billericay	Billericay	1
BAS/0582/15	58 Laindon Road, Billericay	Billericay	5
BAS/1057/13	17 West Park Crescent, Billericay	Billericay	1
BAS/1291/14	181 Noak Hill Road, Billericay	Billericay	1
BAS/1114/13	Gobians Farm, 120 Church Street, Billericay	Billericay	3
BAS/1260/13	Elm Cottage, Laindon Common Road, Little Burstead	Billericay	1
BAS/1495/14	Willows Barn, Clock House Road, Little Burstead	Billericay	1
BAS/1067/14	Land rear of Moby Dick, Church Road, Ramsden Bellhouse, Billericay	Billericay	1
BAS/0106/13	All Saints Church & Community Centre, Crays Hill, Billericay	Billericay	2
BAS/0645/15	Unit 2 King George's Court High Street Billericay Essex CM12 9BY	Billericay	2
BAS/1059/15	273 Perry StreetBillericayEssexCM12 0QP	Billericay	1
BAS/0949/15	Ballacraine Crays Hill RoadBillericayEssexCM11 2YR	Billericay	1
BAS/0356/16	Sudburys FarmSudburys Farm RoadLittle BursteadBillericayEssexCM12 9SP	Billericay	1
BAS/0914/14	47 Crown RoadBillericayEssex	Billericay	1
BAS/0188/15	204 Norsey Road Billericay Essex CM11 1DB	Billericay	1
BAS/0731/15	21 Cavell Road Billericay Essex CM11 2HR	Billericay	5
BAS/1066/15	14 Chapel Street Billericay Essex CM12 9LU	Billericay	2
BAS/1572/15	43 Crown Road Billericay Essex CM11 2AD	Billericay	1
BAS/0005/16	78 High StreetBillericayEssexCM12 9BT	Billericay	5
BAS/0086/15	16 Orchard Avenue Billericay Essex CM12 0SB	Billericay	1
BAS/0781/15	234 Perry StreetBillericayEssexCM12 0QN	Billericay	1
BAS/0948/15	Oak Lodge Buckwyns ChaseBillericayEssexCM12 0TN	Billericay	1
BAS/0971/15	9 Stock RoadBillericayEssexCM12 0AD	Billericay	4
BAS/0712/16	Independant HouseRadford Business CentreRadford WayBillericayEssexCM12 0BZ	Billericay	9
BAS/1546/16	The Jays13 Norsey View DriveBillericayEssexCM12 0QR	Billericay	1
BAS/1784/16	Land At The Junction Of Stock Road &Radford WayBillericayEssex	Billericay	2
BAS/0388/16	2 The Spinney Billericay Essex CM12 0AU	Billericay	1
BAS/0465/15	2 Sun StreetBillericayEssexCM12 9LN	Billericay	13
BAS/0846/15	46 Rosslyn RoadBillericayEssexCM12 9JN	Billericay	1
BAS/0961/15	30 Frithwood LaneBillericayEssexCM12 9PJ	Billericay	1
BAS/0980/15	StrathmoreTye Common RoadBillericay	Billericay	1
BAS/1024/15	Raybourne Cottage Rectory RoadBillericayEssexCM12 9UA	Billericay	2
BAS/1228/15	10A Grange RoadBillericayEssexCM11 2RB	Billericay	2
BAS/1226/16	1 Roman WayBillericayEssex	Billericay	- 15
BAS/1705/16	239 Noak Hill RoadBillericayEssexCM12 9UN	Billericay	2
BAS/0134/17	101 Laindon RoadBillericayEssexCM12 9LG	Billericay	2
BAS/1111/16	16 Scrub RiseBillericayEssexCM12 9PG	Billericay	2
BAS/1166/16	St Margarets FarmBotney Hill RoadBillericayEssexCM12 9SJ	Billericay	3
BAS/0586/16	44 Mons AvenueBillericayEssexCM11 2HQ	Billericay	3
BAS/1336/14	The Ridings, Dunton Road, Billericay	Billericay	1
SS0035	Wickford market between Market Road and Woodlands Road, Wickford	Wickford	35
SS0166	Land adjacent to Nevendon Rd (A132), east of Sutcliffe Close, to north of Champion Close	Wickford	20
SS0177	Land at 157-167 Nevendon Road, Wickford	Wickford	19
SS0206	Wickford Memorial Park community hall and car park, Rettendon View	Wickford	11
SS0677	Cedar Avenue, Wickford	Wickford	7
SS0036	Land at Market Avenue and market Road	Wickford	13
SS0034	Wickford Car Park, rear of High Street and Lady gate Centre	Wickford	90

Site Ref	Address:	Town	Site Housing Yield:
SS0437	Land at Junction of Meadow Way and Hovefield Avenue, Basildon	Basildon	40
SS0438	Land at Novedene, Hovefield Hovefield Avenue, Basildon	Basildon	25
SS0279	Auckland, Hovefields Avenue, Wickford	Wickford	15
SS0280	Sunnydene Farm, Hovefields Avenue, Wickford	Wickford	80
SS0344	Lynview and Land West of Lyndale, Hovefields Drive, Wickford	Wickford	25
SS0277	Lyndale, Hovefields Drive, Wickford	Wickford	30
SS0345	Hawthorns, Hovefields Drive, Wickford	Wickford	30
SS0278	Redlands, Hovefields Drive, Wickford	Wickford	105
SS0248	Land at Faircroft, Hovefields Drive, Wickford	Wickford	25
SS0250	Grangehurst, Honiley Avenue	Basildon	10
SS0247	Land adjacent to Honiley, Honiley Avenue, Wickford	Wickford	20
SS0500	Land off Honiley Avenue, Wickford	Wickford	95
n/a	Newhouse Farm Infill Area	Wickford	22
n/a	Ramsden View Road Infill Area	Wickford	7
n/a	Fairmead	Wickford	15
n/a	Wickford Lawns Plotland Infill Area, Shotgate	Wickford	3
BAS/1028/15	2A Willowdale Centre, High Street Wickford, Essex, SS12 0RA	Wickford	7
BAS/0665/13	61 Station Avenue, Wickford, Essex	Wickford	6
BAS/0261/11	Play Area, Wethersfield Way, Shotgate, Wickford	Wickford	2
BAS/1310/11	29 Victoria Avenue, Wickford, Essex	Wickford	1
BAS/0056/12	Whitehouse Parade 285 - 291 London Road Wickford	Wickford	6
BAS/0338/12	14-16 The Broadway, Wickford.	Wickford	1
BAS/0740/12	119 London Road Wickford	Wickford	2
BAS/0978/14	Bubbles Station Road Wickford	Wickford	1
BAS/0859/12	13 Cedar Avenue Wickford	Wickford	1
BAS/1084/11	Site to the rear of 1 Compton Terrace Wickford, SS11 8QE	Wickford	1
BAS/0244/06	Madley Lodge, 304 London Road, Wickford	Wickford	8
BAS/2171/79/D1	Land off Elizabeth Drive, Wickford	Wickford	1
BAS/0734/14	18 Wick Drive, Wickford	Wickford	1
BAS/0443/14	Irvon Cottage, Irvon Hill Road, Wickford	Wickford	8
BAS/0782/13	7 Alma Close, wickford	Wickford	1
BAS/0864/13	Land adjacent 3 Friern Gardens, Wickford	Wickford	1
BAS/0493/13	64 London Road, Wickford	Wickford	8
BAS/0876/14	Gibraltar House, Gibraltar Walk, Wickford	Wickford	17
BAS/0004/07	Land south of Southend Road, Wickford	Wickford	50
BAS/0387/14	Bakers Court, Hodgson Way, Wickford	Wickford	2
BAS/0481/10	Land north of Station Avenue, Wickford	Wickford	7
BAS/0791/15	Land adjacent to No. 41 Alicia Avenue, Wickford	Wickford	1
BAS/0329/13	1 Middle Mead, Wickford	Wickford	1
BAS/0372/13	1 Bruce Grove, Shotgate, wickford	Wickford	49
BAS/0382/11	Albion Snooker Club, 23-25 The Broadway, Wickford	Wickford	6
BAS/0524/11	The Old Bank, 2-8 The Broadway, Wickford	Wickford	10
BAS/1153/13	31-33 The Broadway, Wickford	Wickford	3
BAS/0727/14	Lyons Butchers, 324 Southend Road, Wickford	Wickford	- 1
BAS/0443/03	North Twinstead	Wickford	2
BAS/0443/13	Land north of Twinstead Road, Wickford	Wickford	7
BAS/1310/15	Riverview London RoadWickfordEssexSS12 0FE	Wickford	5
BAS/1124/16	70 London RoadWickfordEssexSS12 0AN	Wickford	1
BAS/1448/16	65 Elder AvenueWickfordEssexSS12 0LP	Wickford	1
BAS/1459/16	7 - 8 Willowdale CentreHigh StreetWickfordEssexSS12 0RA	Wickford	6
BAS/1756/16	Garage BlockMarket AvenueWickfordEssex	Wickford	5
BAS/1800/16	2 Nevendon RoadWickfordEssexSS12 0QG	Wickford	1
BAS/0549/15	185 Swan LaneWickfordEssexSS11 7DJ	Wickford	1
BAS/0921/15	Broadway House1 - 7 The BroadwayWickfordEssex	Wickford	16
BAS/1098/15	Rettendon Gardens Garages Rettendon GardensWickfordEssexSS11 7ES	Wickford	3
BAS/0139/16	15 Jersey GardensWickfordEssexSS11 7AG	Wickford	3
BAS/0348/16	Diamond (Mechanical & Electrical) Engineering Services, Elm Court Southend RoadWickfordEssexSS11 8DU	Wickford	8
BAS/1234/16	39 Southend RoadWickfordEssexSS11 8BA	Wickford	2
BAS/1694/16	8 Fanton WalkShotgateWickfordEssexSS11 8QT	Wickford	1
BAS/1320/15	Land West OfRadwinter AvenueWickfordEssexSS12 9SH	Wickford	24
BAS/0330/16	Great Broomfields Cranfield Park RoadWickfordEssexSS12 9EP	Wickford	1
BAS/0279/16	Land Adjacent 83 Grange AvenueWickfordEssexSS12 0LY	Wickford	2
BAS/0672/16	15 Castledon RoadWickfordEssexSS12 0EF	Wickford	1
BAS/0554/15	Barn Farm, Cranfield Park Road, Wickford	Wickford	3
n/a	Wickford Town Centre	Wickford	15
n/a	Various Sites GB Infill	Borough Wide	15
n/a	Various Sites Windfall (Wickford TC)	Borough Wide	960
n/a	A - Car Park 14	Basildon	109
n/a	B - Time Square	Basildon	219
n/a	C - Car Park 11	Basildon	27
n/a	D - Car Park 12	Basildon	109
n/a	E - Trafford House	Basildon	105
n/a	F - Land at Market Square	Basildon	269
n/a	G - Town Centre North aka Former M&S site	Basildon	293
n/a	H - Church Walk House	Basildon	44
n/a	I - Acron House Great Oaks	Basildon	17
n/a	J - East Walk and Southernhay	Basildon	86
n/a	K - Great Oaks (Fire, Police, Clinic) 2 locations	Basildon	301
n/a	L - QD/ Post Office & Car Park 2 Two locations	Basildon	286
n/a	M - Great Oaks (former Carphone warehouse)	Basildon	173
n/a	N - Former Toys r us	Basildon	416
n/a	O - Eastgate	Basildon	1,532
n/a	P - Former Youth Centre	Basildon	11
n/a	Craylands Estate & former Fryerns School, Craylands, Basildon	Basildon	535
n/a	2011 - P/S/Seded by BAS/0294/10 - 10/00294 (24126) x 4	Basildon	75
n/a	1 - 29 Lower Southend Road, Wickford.	Wickford	111
n/a	North Twinstead	Wickford	65
n/a	The Wick, Phase 2, Wickford	Wickford	20
n/a	The Wick, Phase 2, Meadows	Wickford	111
n/a	Phase 111, The Wick, Wickford	Wickford	145
n/a	3 - 31 Runwell Road Wickford Essex SS11 7HG	Wickford	84
n/a	Laindon Shopping Centre	Basildon	224
n/a	East Basildon	Basildon	650
n/a	H15:Land North of London Road, Wickford	Wickford	300
n/a	H5:Land West of Gardiners Lane South, Basildon	Basildon	790
n/a	Land North of Dry Street, Basildon	Basildon	725
n/a	H20:Land East of Southend Road, Great Burstead and South Green	Billericay	190
n/a	H19:Land East of Greens Farm Lane, Billericay	Billericay	400
n/a	H18:Land South of Windmill Heights, Great Burstead and South Green	Billericay	200
n/a	H16: Land North of Potash Road, Billericay	Billericay	255
n/a	H14:Land East and South of Barn Hall, Wickford	Wickford	540
n/a	H13:Land North of Southend Road, Shotgate	Wickford	280
n/a	H10:Land East of Noak Bridge, Wash Road, Basildon	Basildon	400
n/a	H9:Land West of Steeple View, Dunton Road, Laindon	Basildon	245
n/a	H8: West of Basildon	Basildon	300
n/a	H12: Land South of Wickford	Wickford	1,100
n/a	H7: Land North of London Road, Vange	Basildon	615
n/a	H17: South West Billericay	Billericay	1,700
n/a	SD3 Neighbourhood Plans	Basildon	1,389
16/01134/FULL	Youth Centre, Long Lynderswood, BasildonEssex, SS15 5AU	Basildon	20
15/00611/PACU	Northgate House, High Pavement, Basildon, Essex, SS14 1EA	Basildon	87
16/01219/PACU	Kelting House Southernhay Basildon Essex SS14 1EQ	Basildon	51
17/01574/FULL	Acorn House Great Oaks Basildon Essex SS14 1AH	Basildon	9
17/01603/PACU	Acorn House Great Oaks Basildon Essex SS14 1AH	Basildon	53
14/01385/PACU	Trafford House Station Way Basildon Essex SS16 5XX	Basildon	384
16/00031/FULL	The Icon Southernhay Basildon Essex SS14 1FG	Basildon	6

Site Ref	Address:	Town	Site Housing Yield:
13/00777/REM	Phase 1B Westside North, Broadmayne Basildon	Basildon	100
BAS/0111/11	Basildon Westside North, (Gloucester Park) Phase 1A	Basildon	84
BAS/0029/06	Essex Ford, Cherrydown, Basildon, Essex, SS16 5AQ	Basildon	208
BAS/0002/07	Craylands Estate & former Fryerns School, Craylands, Basildon.	Basildon	28
BAS/0719/11	Craylands Estates, Fryerns, Basildon.	Basildon	138
BAS/0719/11	Craylands Estates, Fryerns, Basildon.	Basildon	68
BAS/0951/12	Dunton Fields, Southend Arterial RoadDunton, Basildon	Basildon	124
BAS/9003/85/O	Laindon 14 & 14B, Basildon	Wickford	13
BAS/0841/13	Land at Nevendon Road Bypass, Wickford, SS12 0NT.	Wickford	66
BAS/1378/11	Land South Of Downham Road Downham Road Wickford	Wickford	11
BAS/0481/10	Land North of Station Avenue, Wickford.	Wickford	7
12/00951/FULL	Dunton Fields, Southend Arterial RoadDunton, Basildon	Basildon	52
13/00840/REM	Dunton Fields, Southend Arterial Road, Dunton, Basildon	Basildon	98
12/00841/FULL	Land at Nevendon Road Bypass, Wickford, SS12 0NT.	Wickford	66
05/00654/FULL	1 - 29 Lower Southend Road, Wickford.	Wickford	10
11/01378/FULL	Land South Of Downham Road Downham Road Wickford	Wickford	43
14/01405/REM	Dunton Fields, Southend Arterial RoadDunton, Basildon	Basildon	186
15/00889/REM	Land To The East OfBallards WalkBasildonEssex	Basildon	110
03/00443/FULL	Land North OfTwinsteadWickfordEssex	Wickford	9
15/00734/REM	Land At Nether Mayne Kingswood, Basildon Essex SS16 5NL	Basildon	181
		Total	**21,216**

Local Plan Development Map



BasildonCouncil
BASILDON · BILLERICAY · WICKFORD

Regulation 19
Local Plan Extract
Policy Map 2018

Basildon Borough Council
The Basildon Centre
St. Martin's Square
Basildon
Essex
SS14 1DL

KEY TO POLICIES MAP
Borough Boundary
Existing Employment Areas for General B-Class Uses Policy E2
Existing Employment Area for Research and Development Uses Policy E3
Protection of Existing Employment Areas Policies E3,E4
Land West of Gardiners Lane South, Basildon Policy E5
Burnt Mills Extension Policy E6
Rural Enterprise Sites Policy E7
Untidy Industry Zone, Burnt Mills Policy E8
Town Centre Boundaries Policy R7
Local Centres Policy R10
Out of Centre Retail Areas Policy R11
Festival Leisure Park Policy R12
Locations for Hotel Visitor Accommodation Policy R13
New Gypsy and Traveller Pitch and Travelling Showpeople Plot Provision Policy H4
Housing Allocations Policy H5-H20
Residential
New Strategic Open Space
Self-Build Allocations Policy H21
Housing Growth in Crays Hill Policy H22

3 km
1.5 mi

Appendix B: Trip Rates

Residential Trip Rates (PCUs)

	08:00-09:00 Arr	08:00-09:00 Dep	17:00-18:00 Arr	17:00-18:00 Dep	08:00-09:00 Arr	08:00-09:00 Dep	17:00-18:00 Arr	17:00-18:00 Dep
	Previous THIA 2018 Trip Rates				Adjusted Mode Shift Sensitivity Test Trip Rates			
Town Centre	0.042	0.091	0.091	0.065	0.042	0.091	0.091	0.065
Edge of Town Centre	0.097	0.209	0.196	0.158	0.073	0.156	0.147	0.119
Suburban Area	0.099	0.287	0.276	0.138	0.097	0.209	0.196	0.135
Edge of Town	0.134	0.334	0.330	0.158	0.099	0.287	0.276	0.138
Neighbourhood Centre	0.073	0.327	0.362	0.181	0.073	0.327	0.362	0.181

Appendix C: Extended Modelling Results

Extended Junction Modelling Results

Location	Junctions (see figure for locations)	Scenario 4 with highway works and junction mitigation where proposed March THIA 2018		Previous mitigation	Sensitivity test Rev 1 sustainable rates no junction mitigation		Sensitivity test Rev 1 sustainable rates with junction mitigation		Further mitigation	Sensitivity test Rev 1 sustainable rates with further/new junction mitigation	
		AM	PM		AM	PM	AM	PM		AM	PM
		Worst V/C	Worst V/C		Worst V/C	Worst V/C	Worst V/C	Worst V/C		Worst V/C	Worst V/C
Basildon	Ba1	1.06	1.24	Yes	1.10	1.29	1.06	1.24	Yes	0.83	0.89
	Ba2	0.78	0.79	No	0.76	0.82			No		
	Ba4	0.50	0.37	No	0.96	0.93			No		
	Ba5	1.27	1.16	Yes	1.64	1.04	1.19	0.91	Yes	1.01	0.80
	Ba7	1.05	0.81	No	1.47	1.10			Yes	0.97	1.09
	Ba14	0.88	1.07	Yes	1.14	1.43	1.40	2.49	Yes	0.43	0.72
	Ba15	0.99	0.62	No	1.16	1.01			Yes	1.08	1.01
	Ba16	0.84	0.74	No	0.83	0.92			No		
	Ba19	1.00	1.21	No	0.95	0.86			No		
	Ba20	0.44	0.56	No	0.43	0.56			No		
	Ba23	0.83	0.85	No	0.95	0.95			No		
	Ba24	1.16	1.21	Yes	0.86	1.45	2.44	1.27	Yes	0.79	0.84
	Ba25	0.56	0.77	Yes	0.68	0.67	0.64	0.61	No		
	Ba26	0.82	0.89	Yes	1.51	1.88	0.82	1.01	No		
	Ba27	0.90	0.82	No	0.94	0.94			No		
	Ba28	0.76	0.92	No	0.84	0.97			No		
	Ba29	1.12	0.93	No	1.09	0.80			No		
Billericay	Bi1	0.88	1.23	No	1.04	1.13			Yes	0.90	0.95
	Bi2	0.69	1.02	No	0.79	0.70			No		
	Bi3	0.92	1.10	No	0.85	0.97			No		
	Bi4	0.60	0.84	Yes	0.73	0.71	0.52	0.63	No		
	Bi5	0.81	0.85	Yes	0.69	0.66	1.02	0.97	No		
	Bi6	0.98	1.13	No	0.40	0.65			No		
	Bi7	0.51	0.54	No	0.83	0.49			No		
	Bi8	0.52	1.17	No	0.46	1.06			No		
	Bi9	0.73	0.68	No	0.56	0.53			No		
	Bi10	2.36	0.54	No	0.76	0.30			No		
	Bi12	0.82	0.78	No	1.02	0.79			No		
	Bi13	0.87	0.62	Yes	0.59	0.62	0.84	0.84	No		
Wickford	W1	1.12	0.74	No	1.39	1.46			Yes Option 1	0.99	1.01
									Yes Option 2	1.01	0.96
	W2	1.04	1.16	Yes	1.17	1.31	1.20	1.39	Yes	0.93	0.95
	W3	1.06	1.13	No	very high	very high			Yes Option 1	0.93	1.17
									Yes Option 2	0.82	1.11
	W4	0.92	0.75	Yes	1.12	0.99	0.92	0.75	No		
	W5	0.41	0.34	No	0.82	0.98			No		
*	Ra1	0.66	0.91	Yes	0.79	1.07	0.79	0.86	No		

* Rochford District

Mitigation				
Unchanged	Remove	Retain	Revise	Add
			Y	
Y				
Y				
			Y	
				Y
			Y	
Y				
Y				
Y				
Y				
			Y	
		Y		
		Y		
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	Y			
	Y			
Y				
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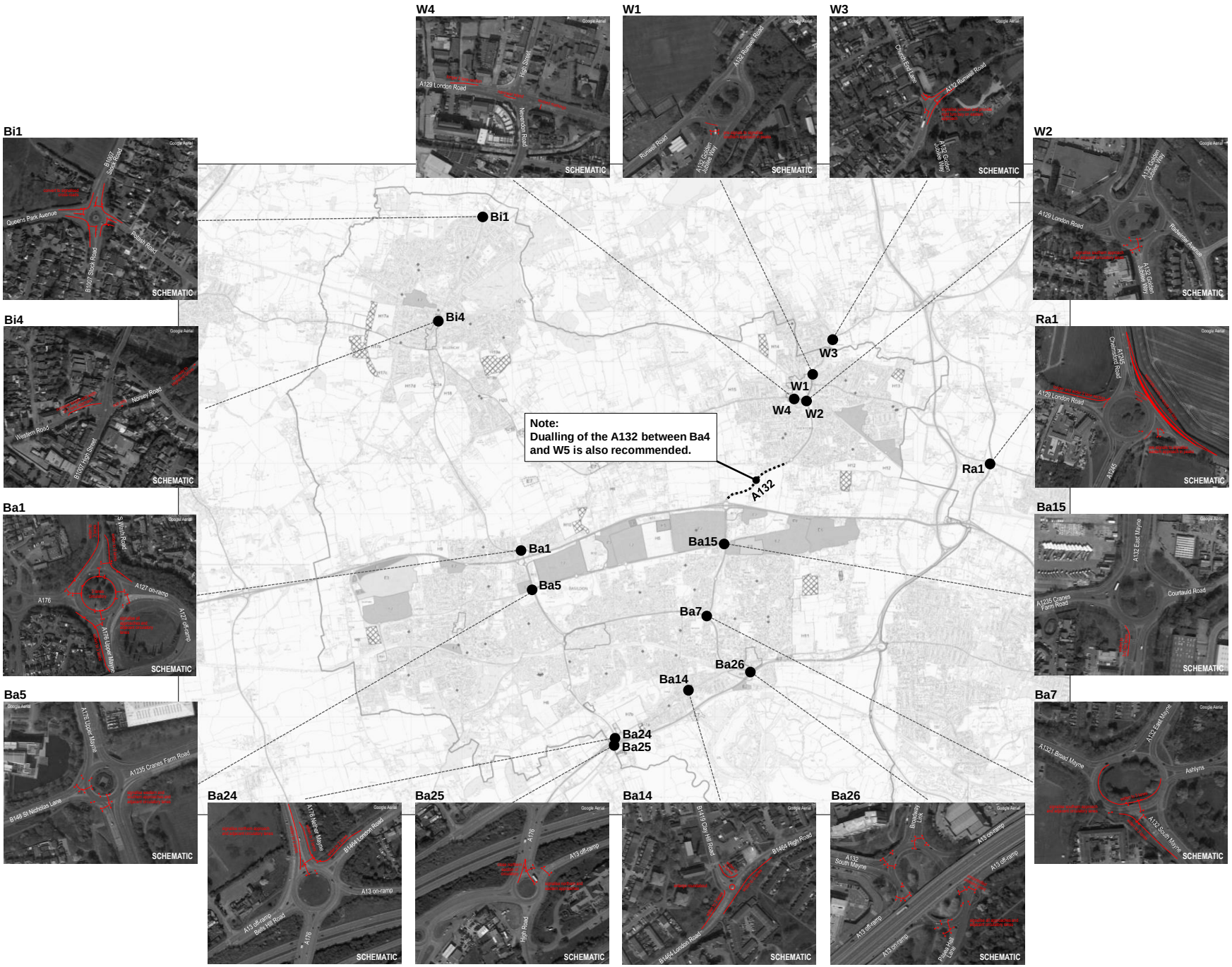
Y				
Y				
Y				
Y				
	Y			
				Y
			Y	
				Y
		Y		
Y				
		Y		
21	4	5	5	
THIA 2018 Assessment	23	12		

Comments
Signalisation of all approaches and adjacent circulating lanes plus 3 lanes on circulatory carriageway and all approaches excluding the western arm and a 2 lane exit on the northern arm.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Signalisation of the western and southern approaches and adjacent circulating lanes.
Widen South Mayne approach to 3 lane entry and provide 3 lane circulatory carriageway between South Mayne and Broadmayne arms (as set out in the Pound Lane Addendum, 2019).
Convert to a standard roundabout with two lanes on all approaches (as assumed for the proposed signalised junction tested in the previous mitigation).
Widen 3 lane East Mayne southern approach to 3.5m per lane (as set out in the Pound Lane Addendum, 2019).
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Signalisation of the northern approach and adjacent circulating lanes, with 3 lanes on the northern approach and 2 lane exits on northern and eastern arms.
Junction mitigation required for safety purposes.
Junction mitigation significantly improves and almost brings junction within capacity.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Little that can be done; sustainable shift on background traffic element a distinct possibility.
Convert to signalised crossroads.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Could retain mitigation for reasons other than capacity.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Within capacity, no mitigation required.
Sustainable shift on background traffic element a distinct possibility.
Within capacity, no mitigation required. Note: Demands from the proposed Billericay Link Road need to be added to this junction.
Within capacity, no mitigation required.
Just over capacity. Sustainable travel shift on background traffic element a distinct possibility.
Within capacity, no mitigation required.
Part-time signalisation of A132 Golden Jubilee Way (as set out in the Pound Lane Addendum, 2019).
Alternative scheme (also provided in the Pound Lane Addendum) involving the redesign of the existing roundabout to provide space for a filter lane accommodating movements from Runwell Road south to north.
Signalisation of the southern approach and adjacent circulating lanes.
Convert to signalised junction with a short lane for right turn movements from Runwell Road (northeast) to Church End Lane (northwest).
Above with signal phasing allowing left turn out of Church End Lane to run with right turn movements from Runwell Road (north) to Church End Lane. Will be difficult to re-model junction.
Junction mitigation significantly improves saturations.
Within capacity, no mitigation required.
Junction mitigation significantly improves saturations.

Appendix D: Mitigation Sketches


W4
W1
W3
Bi1
W2
Bi4
Ra1
Note:
Dualling of the A132 between Ba4 and W5 is also recommended.
A132
Ba1
Ba15
Ba5
Ba7
Ba26
Ba14
Ba24
Ba25
SCHEMATIC

Appendix E: Mitigation Cost Estimates

*Possible Scheme Delivery Costs**

ID	Proposed Mitigation	Possible Delivery Cost	
		Minimum	Maximum
Basildon			
Ba1	Signalisation of all approaches and adjacent circulating lanes plus 3 lanes on circulatory carriageway and all approaches excluding western arm and a 2 lane exit on northern arm.	£1,900,000	£2,500,000
Ba5	Signalisation of the western and southern approaches and adjacent circulating lanes.	£400,000	£600,000
Ba7	Widen South Mayne approach to 3 lane entry and provide 3 lane circulatory carriageway between South Mayne and Broadmayne arms (as set out in the Pound Lane Addendum, 2019).	£900,000	£1,200,000
Ba14	Convert to a standard roundabout with two lanes on all approaches (as proposed for the proposed signalised junction tested in the previous mitigation).	£400,000	£600,000
Ba15	Widen 3 lane East Mayne southern approach to 3.5m per lane (as set out in the Pound Lane Addendum, 2019).	£300,000	£400,000
Ba24	Signalisation of northern approach and adjacent circulating lanes, with two lane exit on northern and eastern arms and three lane approach on northern arm.	£700,000	£900,000
Ba25	Convert to signalised roundabout, with a signal-controlled approach on the A13 exit only, and the closure of the northern section of roundabout circulatory carriageway to create a 'teardrop' design.	£800,000	£1.000,000
Ba26	Convert to signalised roundabout, with all arms and their respective sections of the circulatory carriageway to be signal controlled at peak times. An uncontrolled crossing point is proposed on the westbound A13 off slip and improved lane markings should be investigated on the circulatory carriageway adjacent to A132 South Mayne.	£1,300,000	£1,800,000
Billericay			
Bi1	Convert to signalised crossroads.	£1,700,000	£2,300,000
Bi4	Norsey Road arm northeast-bound only.**	£150,000	£200,000
Wickford			
W1	Part-time signalisation of A132 Golden Jubilee Way (as set out in the Pound Lane Addendum, 2019).***	£400,000	£600,000
W2	Signalisation of the southern approach and adjacent circulating lanes.	£200,000	£300,000
W3	Convert to signalised junction with a short lane for right turn movements from Runwell Road (northeast) to Church End Lane (northwest). Signal phasing to allow left turn out of Church End Lane to run with right turn movement from Runwell Road (north) to Church End Lane.****	£800,000	£1,000,000
W4	Minor alterations to include widening the eastbound A129 London road to lengthen the two-lane approach, the westbound A129 London Road approach has ahead manoeuvre moved from left lane to right lane and the pedestrian island has been reduced to improve alignment.	£100,000	£150,000
Ba4-W5	Dualling of the A132 between the Ba4 (A127 / A132 interchange) and W5 (Darby Digger Roundabout). Part of the dualling in each direction could incorporate bus lanes.	£15,000,000	£20,000,000
Rochford			
Ra1	A dedicated north to east filter lane from A1245 Chelmsford Road to A129 London Road east, with improved road markings, a third lane on A1245 Chelmsford Road south and extension of the two-lane approach A129 London Road west.	£1,000,000	£1,400,000
	Totals	£26,050,000	£34,950,000

** With the exception of the dualling of the A132 between junctions Ba4 and W5, the delivery costs are high level desktop estimates based on existing outline/concept designs and include notional amount for stats diversion and a 30% optimism bias. They exclude construction year uplift, land purchase, compensation to affected third parties, environmental mitigation and detailed statutory works and buildability investigations. The dualling of the A132 between junctions Ba4 and W5 is the most uncertain of all of the costs cited.*

*** No new mitigation is proposed at this junction. Previously proposed mitigation may still be warranted from an urban realm and traffic management perspective.*

**** For junction W1, an alternative scheme was reviewed (also provided in the Pound Lane Addendum), which proposed the redesign of the existing roundabout to provide space for a filter lane accommodating movements from Runwell Road south to north. This scheme is expected to offer longer-term capacity improvements compared with part-time signalisation of the roundabout, but was shown to be significantly more expensive without yielding significant additional capacity benefits.*

***** The 2019 Pound Lane Addendum work tested a mini-roundabout at this junction. While an improvement over the existing junction, a mini-roundabout still operated markedly over capacity without the A127 grade-separated junction improvements. The October 2020 review of the junction noted that a mini-roundabout also disadvantages flows along the A132. The proposed signalisation will allow A132 movements to be protected but will still operate well over capacity, raising questions over the practicality of implementing signalisation. As the October 2020 review of the junction notes, greater emphasis needs to be placed on the impact of improved sustainable transport links and peak spreading on flows through the junction.*