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Part 2 - Regulation 19 and 20 of the Town and Country Planning (Local Planning) (England) Regulations 2012 "Pre-Submission LDP" consultation

Please note that all comments on the Pre-Submission LDP consultation should be provided by completing Part 2 of this form. A separate completed Part 2 should be provided for each comment made within a representation.

2.1 To which part of the Maldon District Pre-Submission Local Development Plan (LDP) does this representation relate?

a. Paragraph number		b. Policy reference	S4
c. Proposals map		d. Other section (please specify)	

2.2 Do you consider the Maldon District Pre-Submission LDP to be . . . (✓ as appropriate)

a. Legally compliant YES ☐ NO ☐

To be legally compliant the LDP has to be prepared in accordance with the Duty to Co-operate and legal and procedural requirements. This is required by Government guidance.

b. Sound YES ☐ NO ☑

To be 'sound' a Local Plan should be positively prepared, justified, effective and consistent with national policy. This is required by Government guidance.
If you do not consider the LDP to be sound, please complete section 2.3 below

2.3 Do you consider the Maldon District to be unsound because it is not . . . (✓ as appropriate)

a. Positively prepared ☑

To be positively prepared the Plan should be prepared on a strategy which seeks to meet objectively assessed development and infrastructure requirements

b. Justified ☑

To be justified the Plan must be:
- Founded on a robust and credible evidence base
- The most appropriate strategy when considered against the reasonable alternatives

c. Effective ☑

To be effective the Plan must be:
- Deliverable;
- Flexible;
- Able to be monitored

d. Consistent with National Policy ☑

The Plan must be consistent with Government guidance as set out within the National Planning Policy Framework

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On the following pages, please explain why you think the Plan is unsound or not legally compliant, and set out any changes you feel should be made to the Plan to make the Plan sound or legally compliant.

Please note: As there will not normally be a subsequent opportunity to make further representations, please include all the information, evidence and supporting information necessary to support/justify your representation and the suggested change(s) to the Plan. After this stage, further submissions will only be invited at the request of the Planning Inspector, based on the matters and issues the Inspector identifies for examination.

2.4 If you consider the Maldon District LDP to be unsound or not legally compliant please explain why in the box below. Please be as precise as possible. Please also use this space for any comments in support of the LDP.

If the box is not big enough for your comments, please attach another page marked appropriately.

As already detailed in the written representations regarding Policy S3, Persimmon Homes does not agree with the need to establish comprehensive and detailed Masterplan documents for each of the Garden Suburbs. Such masterplans do not deliver development certainty or design quality and do not benefit from the rigour and pre-application consultation established through the preparation of a detailed planning application supported by the technical evidence. Masterplans are costly, inconclusive in development certainty and result in unnecessary delay and overly prescriptive design requirements that stifle development. This does not correspond with the objectives of the National Planning Policy Framework (hereafter referred to as the NPPF) and the Government's objective to get Britain building to stimulate economic and housing delivery. For more details please refer to our S2 written representations.

Ecology and Archaeology

Furthermore, Persimmon Homes consider that the following two requirements do not need to be specified and are onerous at this stage:

• Development proposals must be accompanied by a comprehensive and detailed ecological survey; and
• Prior to any development a comprehensive and detailed archaeological assessment should be undertaken.

In terms of archaeology, it is common practice for archaeological desk-top and investigatory work to be undertaken first in order to determine what level of excavation, evaluation and mitigation is necessary. Archaeological assessment requirements are then usually set as standard conditions for any planning permission granted in consultation with English Heritage and ECC Historic Environment department and it is therefore unnecessary to specify it within Policy S4. Archaeological matters should be assessed and addressed on a site by site basis and by setting a 'comprehensive and detailed' archaeological assessment as a broad policy requirement the Council is acting onerously and potentially delaying development unnecessarily, which contradicts with National Planning Policy Framework. Indeed, paragraph 128 confirms that the submission of an appropriate desk-based assessment is sufficient for sites where there is potential for heritage assets and a field evaluation can be undertaken if proven necessary.

Similarly, it is considered that setting a broad policy requirement for all strategic sites to provide a 'comprehensive and detailed' ecological survey is bad practice. Each development proposal will have its own ecological context and circumstances that should be investigated and addressed in a site specific manner and in consultation with Natural England as is the common practice. Any ecological matters that arise can be addressed through the planning conditions of any planning permission granted. Again, by asking for a 'comprehensive and detailed' survey where it may not be warranted is burdensome and can cause significant delay, particularly considering the times of years that ecological surveys are limited to. It is considered that Policy N2 (Natural Environment, Geodiversity and Biodiversity) addresses the matter of ecology sufficiently and so it does not need to be covered in Policy S4 as well.

Infrastructure

Policy S4 suggests that the small sites, S2(e) and S2(f), are bound by the infrastructure delivery of the wider Heybridge Garden Suburb area, which could hinder their ability to progress. Under Persimmon Homes' instruction, URS has produced a report to consider the distribution of trips generated by site S2(f). The report concludes that the delivery timeframes for the Link Road and internal roads connecting to the Broad Street Green Road are uncertain and likely to be dependent on a number of factors, including funding and development triggers. By being bound to the delivery of significant infrastructure outside of its own site and control, there is serious risk that sites S2(f) and S2(e) will not be delivered within the first five year period. In short, without further clarity and the allowance of flexibility, the Council is running the risk of not having a positively prepared and effective plan as the deliverability of site S2(f) could be impaired by viability constraints.

Furthermore, and of greatest concern to Persimmon Homes, it is not made absolutely clear within the policy or its supporting evidence base what infrastructure contributions are expected from site S2(f). Table 21 of the Infrastructure Delivery Plan Update (Dec 2013) (hereby referred to as the IDP Update) only lists 5 pooling items that site S2(f) (or ADD as referred to in the document) will be subject to. However, the only reason why it has been excluded from other items, such as contributions towards the Plume School and junction mitigation works, is because CIL regulations prohibit the use of more than 5 contributions for specific S106 pooling (as outlined in paragraph 15.16 of the IDP Update).

Paragraph 15.26 and 15.27 of the IDP Update go on to explain that possible solutions to the limitations set by regulations could be that the site with the least impact is exempt from contributing towards the S106 pool, or that perhaps the list of five sites for each pooling item could be varied to fairly spread the cost. This does not suggest that site S2(f) is definitively excluded from contributing towards S106 pool items other than the ones it is already listed against and yet the average per dwelling contribution figure provided in Table 22 (£19,525) is calculated on the assumption that it is.

2.4 If you consider the Maldon District LDP to be unsound or not legally compliant please explain why in the box below. Please be as precise as possible. Please also use this space for any comments in support of the LDP.

If the box is not big enough for your comments, please attach another page marked appropriately.

This figure has then been translated into the Viability Post Consultation Update (November 2013), where Table 7.5 continues to not apply costs relating to pooling items, such as junction mitigation works and the Plume School, in its per dwelling calculation for site S2(f). The vital point here is that there is a very real danger that the infrastructure contribution for site S2(f) has been drastically under estimated as it is possible that it will not be exempt from contributing towards certain S106 pool items as has been assumed. This is more likely to be the case in light of the Government's latest CIL Regulation Amendments (February 2014), which extends the deadline for when local authorities can no longer pool from more than five contributions from 6th April 2014 to 6th April 2015.

Furthermore, the IDP Update (2013) and Viability Study Update (2013) assume the infrastructure costs for each site that make up the Garden Suburb allocations. However, the level of infrastructure contributions that will be needed for smaller sites to meet their own infrastructure needs will not be known until the details of Site S2(d) site specific S106 Agreement to deliver the range of infrastructure required to service the site, on-site, is negotiated. Until this point, the viability and expected infrastructure delivery of each site is all based on uncertain assumptions.

This means that the viability of site S2(f) has been assessed by the Council against an incomplete set of assumed infrastructure contribution costs. Once the CIL rate of £70 per sqm is applied, as per the draft CIL schedule, and the 40% affordable housing requirement, as per draft LDP policy H1, the development of site S2(f) could potentially become subject to viability constraints, which in turn could hinder its ability to contribute towards the district's five year housing delivery.

Please also refer to the written representations submitted in relation to Policy H1, where further flaws have been found by Lambert Smith Hampton in the assumptions that have been made in the Council's viability studies. In light of the above points and those made against Policy H1, Persimmon Homes query whether the CIL and affordable housing assumptions are robust until a corrected viability evidence base is made publicly available.

2.5 Please explain in the box below what change(s) you consider necessary to make the Maldon District LDP legally compliant and sound.
Please be as precise as possible. Please explain why this change will make the Maldon District LDP legally compliant and sound. It will be helpful if you are able to put forward any suggested revised wording of the policies or supporting text.

If the box is not big enough for your comments, please attach another page marked appropriately.

Persimmon Homes' considers that a light touch, overarching Masterplan Framework would be an appropriate alternative to a complete, detailed masterplan document. The Council should therefore seek to remove the need to produce Masterplans for each of the Garden Suburbs and instead focus on setting broad design parameters, densities and design criteria and delivering development through close consultation between developers, the Council, and informed by meaningful consultation with key stakeholders and the local community.

The requirement for a comprehensive and detailed archaeological assessment to be undertaken should not be specified within policy S4 and then broadly applied to all strategic proposals, which will differ significantly on a site by site basis. Archaeological matters should be captured and addressed through planning conditions and in consultation with ECC Historic Environment department and English Heritage, as is the practice in all other Essex local authorities.

In the same vain, policy S4 does not need to set the requirement for a comprehensive and detailed ecological survey, as this matter should also be dealt with on a site by site basis and is adequately covered by policy N2.

Measures or details should be put in place so that the small, 100 unit sites that make up the North Heybridge Garden Suburb are not reliant on the delivery of strategic infrastructure that is outside their control. For instance, URS's Trip Assessment Report illustrates the even with the delivery of 150 units at site S2(f), a maximum of 38 more trips would be expected on any approach within Heybridge, which equates to only one additional vehicle every one minute and 35 seconds. Persimmon Homes also instructed Wormald Burrows Partnership Limited for a study that illustrates that the development of site S2(f) does not present a risk in terms of flooding or drainage. There is therefore no need for site S2(f) to be subject to delay due to the Link Road, other highway infrastructure and strategic flood alleviation measures. The Council should ensure that this does not happen as it will otherwise risk preventing the small sites being able to contribute to the first five year plan period. Please find both URS's Trip Assessment Report and Wormald Burrows Partnership's Surface Water Drainage and Flood Risk Statement enclosed for completeness.

Most importantly, the Council needs to either confirm to Persimmon Homes that site S2(f) is only liable for the S106 pooling items as listed in Table 21 of the IDP Update (December 2013) or it needs to assume a higher per dwelling infrastructure cost than is currently being shown in Table 22 of the IDP Update and Table 7.5 of the Viability Study Update (November 2013). If it is the latter, then the CIL rate and affordable housing percentage being applied to site S2(f) needs to be lowered in order to ensure the site's viability. As it currently stands, the LDP is based on evidence that is not robust and could jeopardise the deliverability of an allocated site.

The Council has not yet published a Planning Obligations SPD to reveal what site specific S106 costs may be sought towards infrastructure, social and community impacts not covered by CIL charged schedule and the IPD Update.

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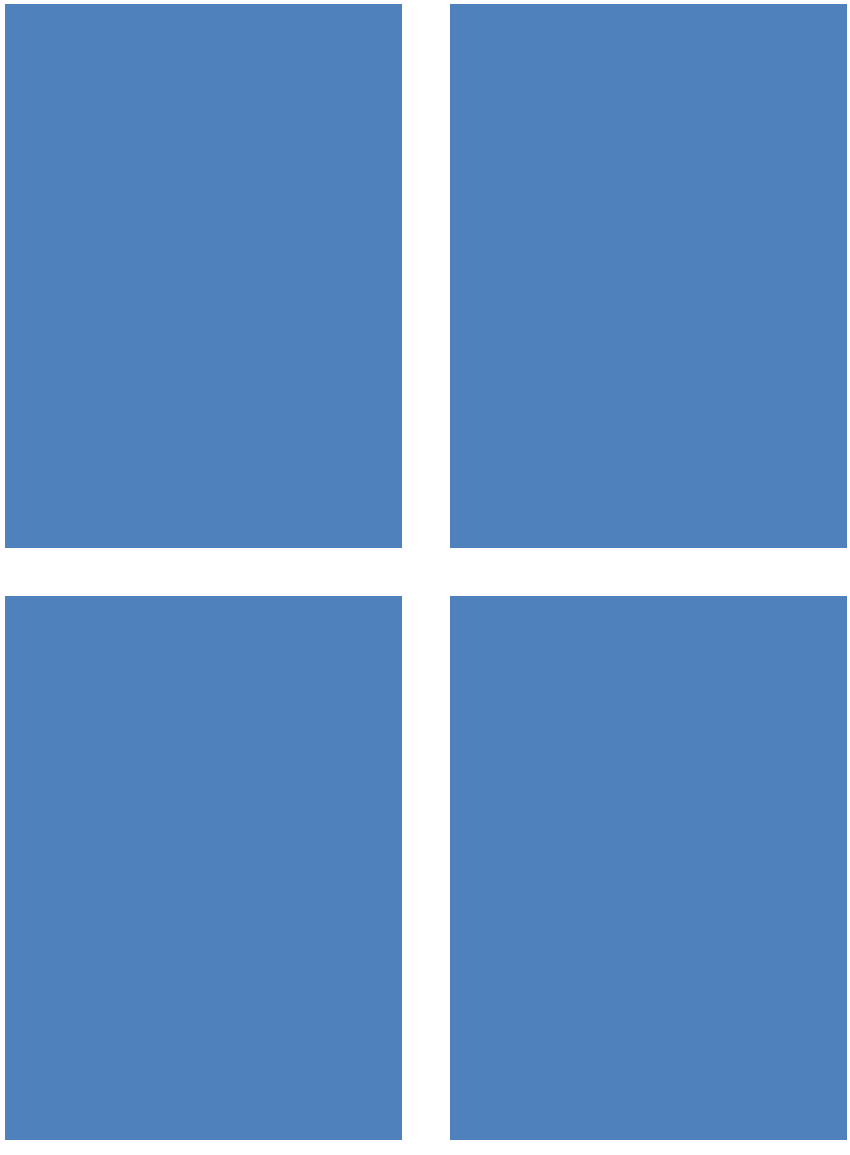
Land to the west of Broad Street Green, Heybridge

Trip Assessment Report

March 2014

Prepared for:
Persimmon Homes

UNITED KINGDOM & IRELAND



REVISION SCHEDULE					
Rev	**Date**	**Details**	**Prepared by**	**Reviewed by**	**Approved by**
1	March 2014	Final	**Paul Kelly** Senior Transport Planner	**Colin Romain** Principal Transport Planner	**Margaret Theobald** Head of Transport Planning for Development

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Limitations

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Where the conclusions and recommendations contained in this report are based upon information provided by others it is upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by URS has not been independently verified by URS, unless otherwise stated in the Report.

The methodology adopted and the sources of information used by URS in providing its services are outlined in this Report. The work described in this Report is based on the conditions encountered and the information available. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties.

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1 INTRODUCTION

1.1.1 URS has prepared this report on behalf of Persimmon Homes in support of proposed residential development on land to the west of the B1022 Broad Street Green. The proposed development site is situated to the north of Maldon and Heybridge, west of Broad Street Green Road (B1022), as shown by **Figure 1.1**.

1.1.2 In Maldon District Council's (MDC) 'Local Development Plan' (LDP), an allocation of 100 residential units is proposed for the site as part of the wider North Heybridge Garden Suburb Masterplan, which seeks to deliver 1,235 units in total. The LDP outlines that 350 homes are expected to be constructed and occupied within five years, including the allocation at land west of Broad Street Green.

1.1.3 As part of works to support a future application for the land west of Broad Street Green Road, initial scoping has been undertaken with MDC and Essex County Council and a Transport Assessment is now being prepared.

1.1.4 In advance of the Transport Assessment being completed, and the purpose of this report is to review the distribution of vehicular trips to and from the land west of Broad Street Green, in order to appraise delivery of an access from Broad Street Green Road. The report considers the level of vehicular trips that will pass through Heybridge, and areas such as Colchester Road, in the AM and PM peak.

1.1.5 The document begins by looking at the likely distribution of trips based on the existing highway network, assuming access to the site from Broad Street Green Road. Two distribution methodologies are explored in order to arrive at the likely scenario for the site.

1.1.6 Following this, consideration is given to the distribution of trips across the area assuming the delivery of the proposed link road which is being considered by ECC and MDC as part of the wider development strategy. This includes the likely differences arising from an access on Broad Street Green Road and directly from the proposed North Heybridge link road, which was Essex County Council's (ECC) initial preferred solution.

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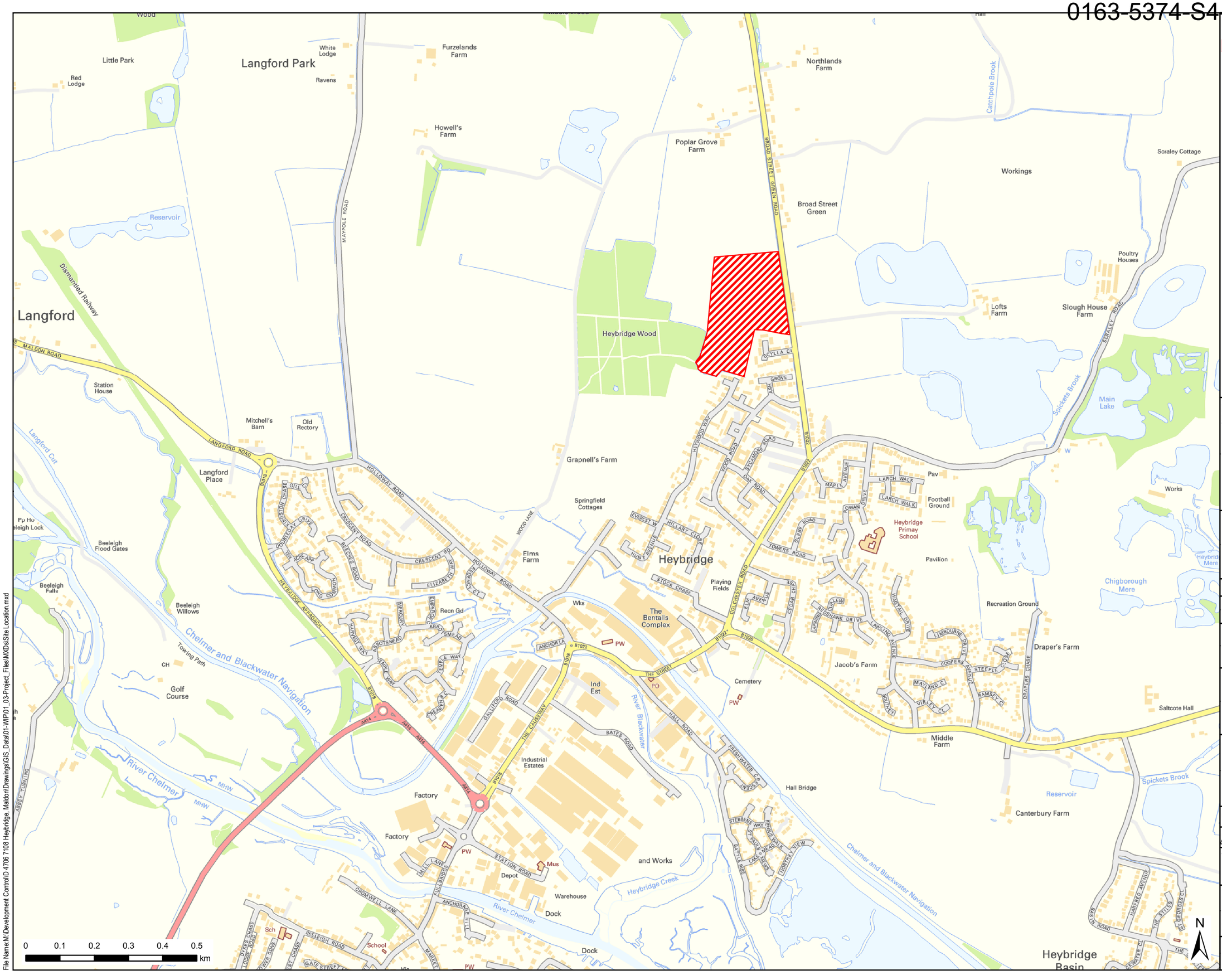

LEGEND

Site Location

Revision Details	By / Check	Check Date	Suffix

Project Title

LAND WEST OF BROAD STREET GREEN, HEYBRIDGE

Drawing Title

SITE LOCATION PLAN

Drawn	Checked	Approved	Date
PK	CR	JC	10/12/13

URS Internal Project No.	Scale @ A3
47067018	1:10,000

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Drawing Number	Rev
FIGURE 1.1	RevA

File Name:M:\Development Control\ID 47067108 Heybridge, Maldon\Drawings\GIS_Data\01-WIP\01_03-Project_Files\MXDs\Site Location.mxd

2 TRIP GENERATION AND DISTRIBUTION (WITHOUT LINK ROAD)

2.1 Background

2.1.1 Broad Street Green Road is located directly adjacent to the east of the site and runs parallel with its eastern boundary. The road connects locations, such as Great Totham and Tiptree in the northeast to Heybridge, affording access towards Maldon, and other destinations in Essex via roads such as the B1018 and the A414. Consequently, Broad Street Green Road is identified by Essex County Council within its 'Development Management Policies' (2011), as a main distributor road, whose primary function is the carrying of traffic safely and efficiently between major centres within the County.

2.1.2 As part of the North Heybidge Garden Suburb masterplan, a link road between Broad Street Green Road and Langford Road / Heybridge Approach is proposed to act as a bypass for central Heybridge. Discussions at the North Heybridge Masterplan transport working group, suggested a timeframe of two and a half to three years for the full delivery of the link road, subject to funding streams and triggers which are to be agreed. It was indicated that development is likely to be from west to east.

2.1.3 Giving consideration to the context of the Local Development Plan and delivery of key infrastructure, such as the link road, it is proposed that access for land west of Broad Street Green is taken from Broad Street Green Road. This is for the following reasons:

- That land west of Broad Street Green Road is to be delivered within the first five years of the LDP, forming a key element of housing supply delivery
- That construction timeframes for the link road will be dependent on development triggers for the North of Heybridge development which are at this stage uncertain
- Any connection between the Broad Street Green site and link road would be reliant on third party land and the internal design for the North of Heybridge development and
- That consultation at the North Heybridge Garden Suburb stakeholder event suggested that delivery of an access on to Broad Street Green Road was important in integrating the new site with the existing Heybridge area.

2.1.4 Therefore, the provision of an independent access will safeguard the deliverability of the site. Initial assessment confirms that the required capacity, design and safety criteria for an access from Broad Street Green Road can be met. Access would be via a priority t-junction.

2.1.5 In the supporting transport evidence for the LDP, consideration is given to the end state 2026 transport conditions for the area, with and without the proposed development and link road. However, minimal consideration is given to the interim and housing coming forward to meet the delivery targets. Therefore, this chapter gives examination as to the level and distribution of trips without the link road at land west of Broad Street Green, particularly for central Heybridge junctions, such as Goldhanger/Colchester Road, which are noted as constrained in the 2026 future case.

2.2 Methodology

Trip Distribution

2.2.1 To evaluate the potential level of trips generated from land west of Broad Street Green that are likely to pass through key junctions within Heybridge prior to the delivery of the link road, two approaches have been explored. These are set out below.

ECC Census 2001 (Journey to Work)

2.2.2 In preparing the Maldon LDP, ECC commissioned or completed a series of assessments in order to evaluate the impact of potential core strategy sites on the road network.

2.2.3 2001 Census journey to work data, allocated into zones of travel, was employed by ECC to derive forecast distributions for each potential core strategy site. **Appendix A** illustrates the zoning system used.

2.2.4 The proposed Broad Street Green site sits on the boundary between Zones 7 and 8. Due to the more residential nature of Zone 7, this was chosen by ECC as a proxy for the site in relation to likely trip patterns. The raw distribution for this zone has therefore been retained for the purposes of this assessment.

2.2.5 Further detail regarding ECC's methodology can be found in Section 3.5 of the following:

- 'Assessment of Impact of Proposed Development Sites on Existing Junctions' (Mouchel and ECC, December 2010); and
- 'Assessment of Impact of Proposed Development Sites in Heybridge, South Maldon and Burnham-on-Crouch' respectively (ECC, May 2013)

2.2.6 The distribution produced for the site by ECC, assumed that the link road was in place and that all development traffic would principally use this link. Therefore, the basic zone distributions have been taken forward and allocated to the routes available without the link road, with the assumption that access will be taken from Broad Street Green Road.

2.2.7 One key amendment to the distribution, relates to the assignment of traffic to and from Zone 25. This zone covers areas close and north of the A12, spreading from the east (e.g. Ipswich, Colchester) to the west (towards Chelmsford, London), also taking in key local destinations such as Witham and Braintree. In the local area model, all traffic is allocated to the Link Road and then the B1019. However, this means that in some instances traffic would have to double back on itself to travel east to areas such as Colchester and Ipswich, which is considered unrealistic. Also it underplays the role of Broad Street Green Road as a Main Distributor between local centres.

2.2.8 As an example, for traffic travelling north and east, to key local attractors such as Braintree and Colchester, journey times are greatly reduced by using Broad Street Green Road compared to the B1019, even with the link road in place. Furthermore, even for destinations in the west e.g. Chelmsford, similar travel distance and times are expected, until such time as the link road is introduced.

2.2.9 Therefore, it has been assumed for the purposes of the without link road distribution, that 75% of traffic travelling to and from Zone 25 would travel north along Broad Street Green Road, rather than through Heybridge, given that delays to journey times are likely to be experienced during the AM and PM peak if travelling through Heybridge.

2.2.10 **FIGURES 2.1** and **2.2** illustrate the expected distribution of trips across the local Heybridge area. Based on the results of the distribution exercise conducted by ECC, it is noted that a number of trips are local to the Heybridge area, and therefore are assigned to local Heybridge zones e.g. 1, 5, 6 and 7.

Traffic Surveys

2.2.11 As an alternative to the 2001 Census approach and to test ECC's distribution, turning count surveys undertaken in March 2012 have been reviewed. Selected movements at each local junction have been compared and a percentage split determined, in order to assign a direction for development traffic through the Heybridge area. This method has been adopted, as the latest information available regarding journey to work destinations is 2001; and as such the use of the count data is considered to provide an alternative up to date source for predicting future travel patterns for the site without the link road.

2.2.12 At the access to the junction, development traffic has initially been distributed north or south to and from the site, based on the percentage split of traffic at Scraley Road. This was considered to comprise a reasonable representation of the distribution of trips from the proposed development, as the road initially serves access to a residential estate, and therefore is likely to reflect the directions of travel to/from the main destinations in the local area for residential development.

2.2.13 **FIGURES 2.3** and **2.4** summarise the calculated percentage splits at each of the junctions in the AM and PM peaks respectively. With the changes to the ECC distribution in regards to Zone 25, the level of traffic travelling to and from the north on Broad Street Green is shown to be at a similar level to that forecast from the traffic surveys therefore supporting the changes to the ECC distribution.

Trip Generation

2.2.14 Traffic forecasts for the proposed development in the AM and PM peaks have been developed using trip rates, which in the interests of consistency, have been taken from Essex Highway's (2013) "Further Assessment of Impact of Proposed Development Sites in Heybridge, and South Maldon on Highway Network". This was produced to support the development of Maldon District's Local Development Plan. The trip rates taken from this document are summarised in **TABLE 2.1** below.

Table 2.1: Proposed Trip Rates

Land Use	AM Peak		PM Peak	
	Arr	Dep	Arr	Dep
Houses Rented	0.129	0.235	0.270	0.172
Houses Privately Owned	0.157	0.457	0.401	0.235

2.2.15 Assuming a 60/40 split for private and affordable dwellings, as set out in the LDP, two development scenarios are considered, the first of these is for the 100 allocated residential units and the second is for 150 residential units.

2.2.16 The trip rates shown have been applied to each development schedule, with the resulting trip levels shown in **TABLE 2.2** below. For the purposes of the assessment it has been assumed that the trip rates for 'Houses Rented' are commensurate to affordable housing.

Table 2.2: Proposed Trip Levels (60% Private, 40% Affordable)

Land Use	100 Units (60 private, 40 affordable)				150 Units (90 private, 60 affordable)			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Houses Rented	5	9	11	7	8	14	16	10
Houses Privately Owned	9	27	24	14	14	41	36	21
Total	**14**	**36**	**35**	**21**	**22**	**55**	**52**	**31**

2.2.17 If the split between private and affordable housing was altered, for example to a 70/30 split in favour of private housing, the difference in trips would be small, as shown by **Table 2.3** below. However, for the purposes of the assessment, the 60/40 split shown in **Table 2.2** has been used, as this is the initial level referred to in MDC's LDP.

Table 2.3: Proposed Trip Levels (70% Private, 30% Affordable)

Land Use	100 Units (70 private, 30 affordable)				150 Units (105 private, 45 affordable)			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Houses Rented	4	7	8	5	6	11	12	8
Houses Privately Owned	11	32	28	16	16	48	42	25
Total	**15**	**39**	**36**	**21**	**22**	**59**	**54**	**33**
Difference to Table 2.2	**+1**	**+3**	**+1**	**0**	**0**	**+4**	**+2**	**+2**

2.3 Trip Assessment

2.3.1 The proposed trip levels for the 100 and 150 residential unit scenarios shown in **Table 2.2** have been applied to the two distribution approaches set out. **Figures 2.5** to **2.8** illustrate the resulting trip levels that are forecast to travel through key junctions within the Heybridge area for the AM and PM Peaks. **Tables 2.4** and **2.5** summarise the traffic increases by junction for the derived ECC and traffic survey distribution.

Table 2.4: Trip Distribution Summary by Junction (ECC Distribution)

Ref	Junction	100 Units		150 Units	
		AM Peak (vehicles)	PM Peak (vehicles)	AM Peak (vehicles)	PM Peak (vehicles)
1	Langford Rd / Heybridge Approach	3	3	4	5
2	Maypole Rd / Holloway Rd	3	3	4	5
3	A414 Rdbt	17	17	26	27
4	The Causeway / Fullbridge	24	24	36	38
5	The Street / The Causeway	30	32	46	48
6	Goldhanger Rd / Colchester Rd	32	34	49	51

Table 2.5: Trip Distribution Summary by Junction (Survey Distribution)

Ref	Junction	100 Units		150 Units	
		AM Peak (vehicles)	PM Peak	AM Peak (vehicles)	PM Peak (vehicles)
1	Langford Rd / Heybridge Approach	6	6	8	9
2	Maypole Rd / Holloway Rd	6	6	8	9
3	A414 Rdbt	12	13	18	20
4	The Causeway / Fullbridge	26	32	40	47
5	The Street / The Causeway	32	38	48	56
6	Goldhanger Rd / Colchester Rd	34	41	51	62

2.3.2 With 150 residential units, the results indicate that the maximum increase in traffic will range from between 51 and 62 vehicles in the PM peak at Goldhanger Road / Colchester Road roundabout, dependent on the distribution considered. These will be split between approaches, with a maximum of 38 vehicles on any approach. This translates to approximately one additional vehicle every 1 minute 35 seconds on this approach, which is unlikely to comprise a severe impact to the junction. Beyond this location, impacts will reduce with the levels of traffic passing through each junction similar for both the ECC distribution and survey distribution approaches.

2.3.3 Based on discussions to date at the transport working group it would seem reasonable to assume that the earliest the link road would be in place is 2019. Subject to LDP adoption, this would be approaching the end of the five year housing supply period, by which point 350 units are expected to be delivered, including 100 units at Broad Street Green. With development for the North of Heybridge (100 units) and land to north of Holloway Road (150 units) likely to be accessed from the west (Langford Road/Heybridge Approach) and Holloway Road respectively, pressure from these developments on key junctions such as the Goldhanger Road / Colchester Road and The Street / The Causeway is likely to be limited as indicated above.

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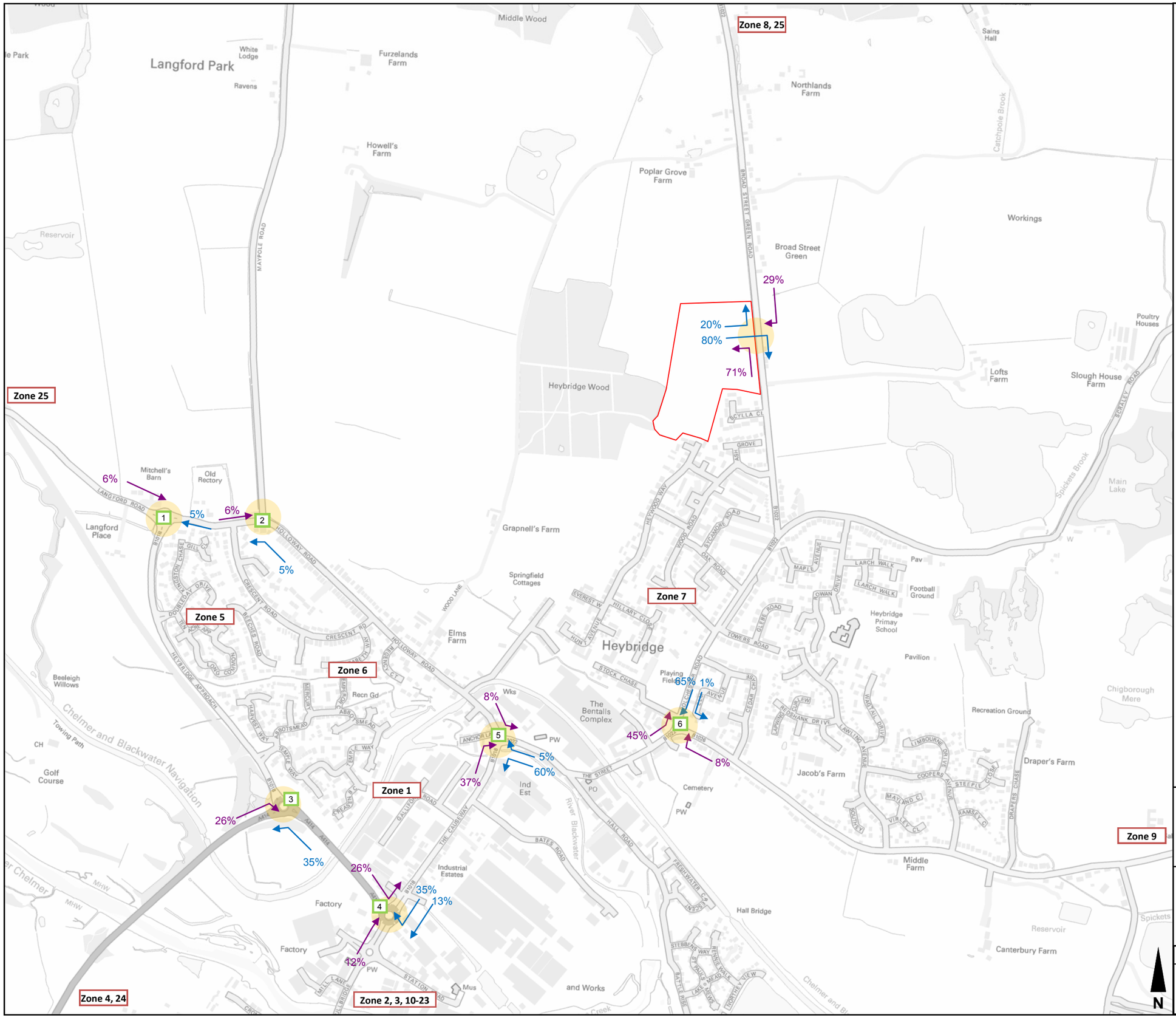

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow
- 1 Junction Reference
- Zone X 2001 Census Journey to Work Zone

AM Peak ECC Distribution

Figure 2.1

NOT TO SCALE

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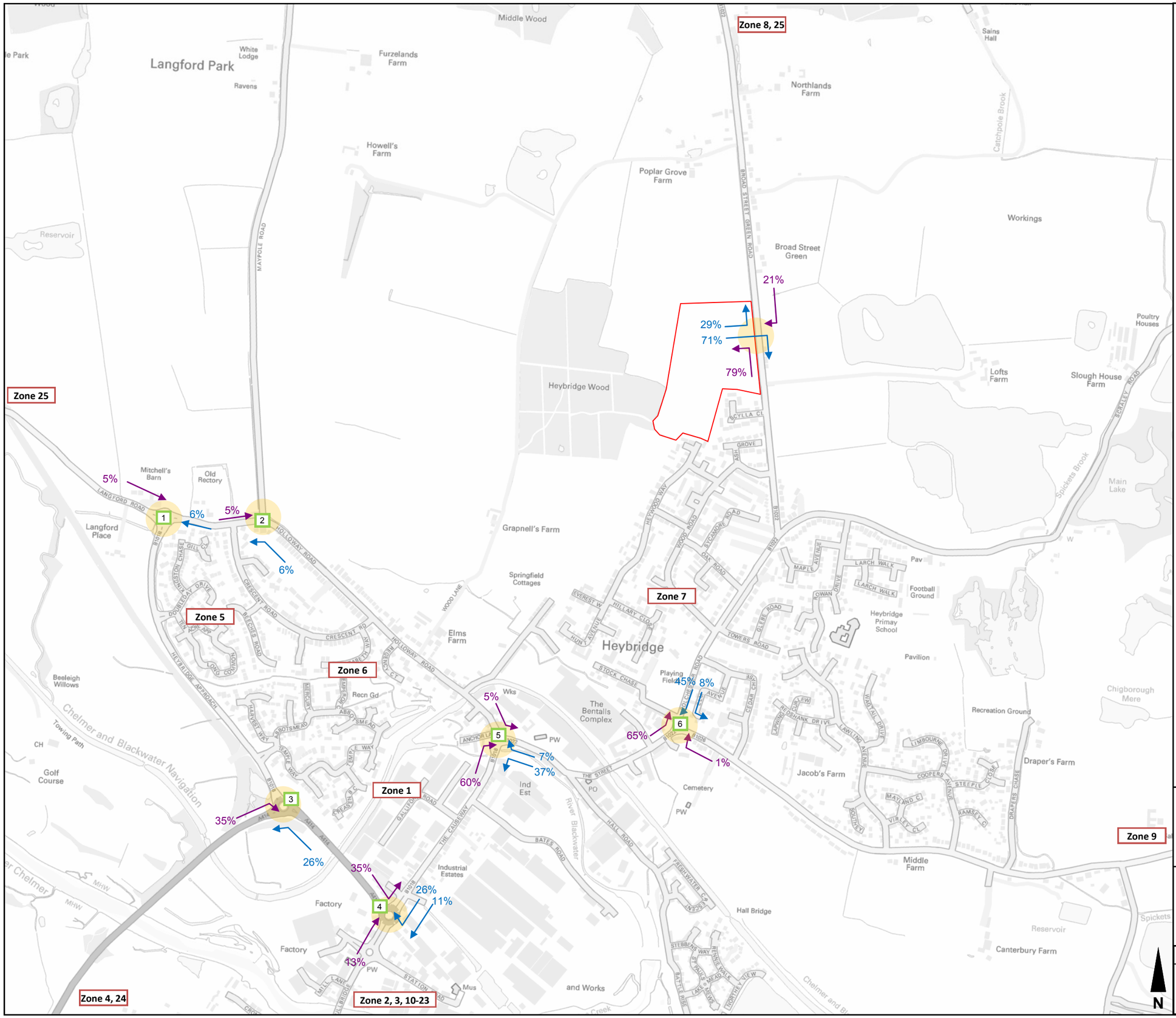

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow
- 1 Junction Reference
- Zone X 2001 Census Journey to Work Zone

PM Peak ECC Distribution

Figure 2.2

NOT TO SCALE

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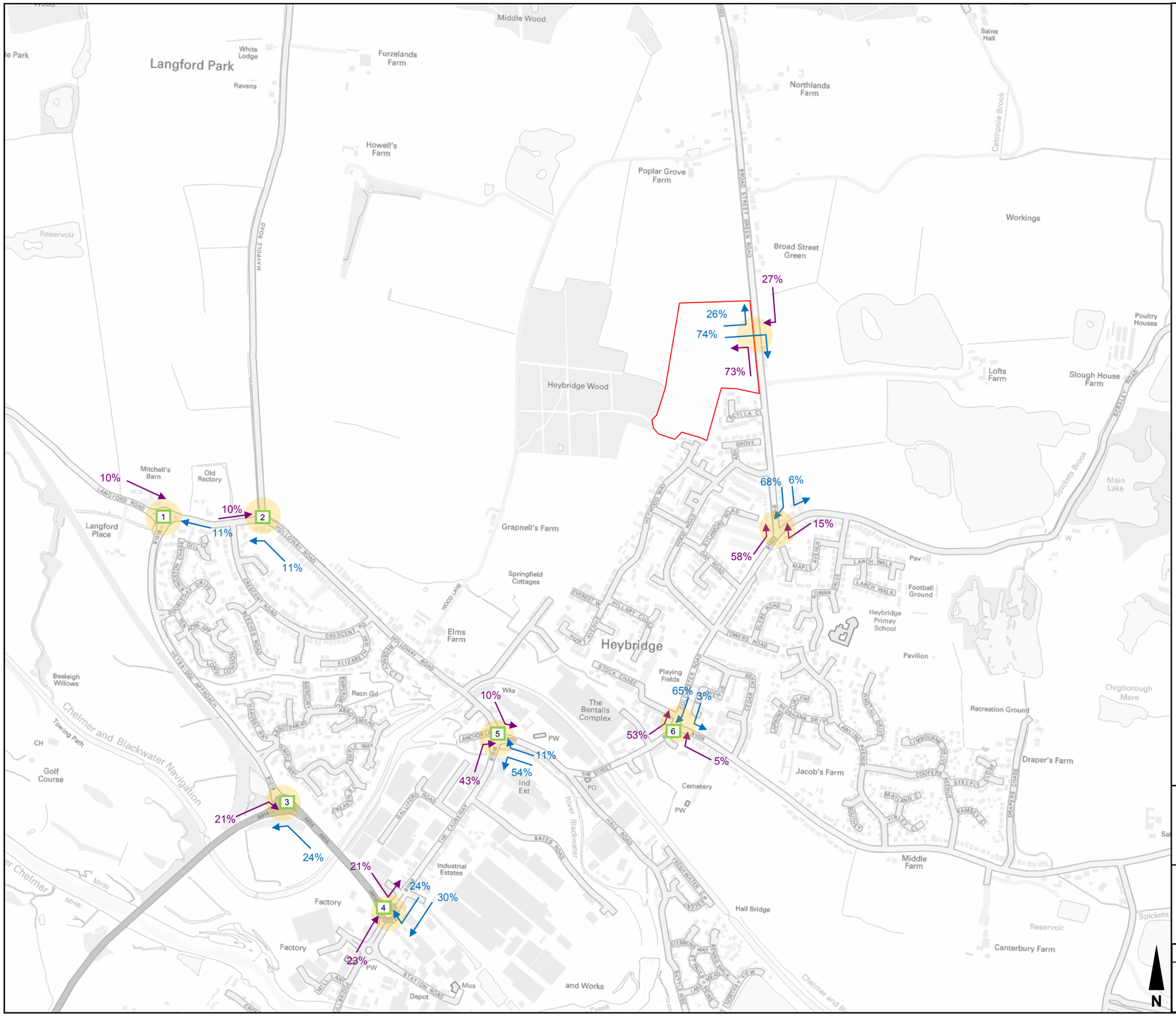

AM Peak Survey Distribution

Figure 2.3

NOT TO SCALE

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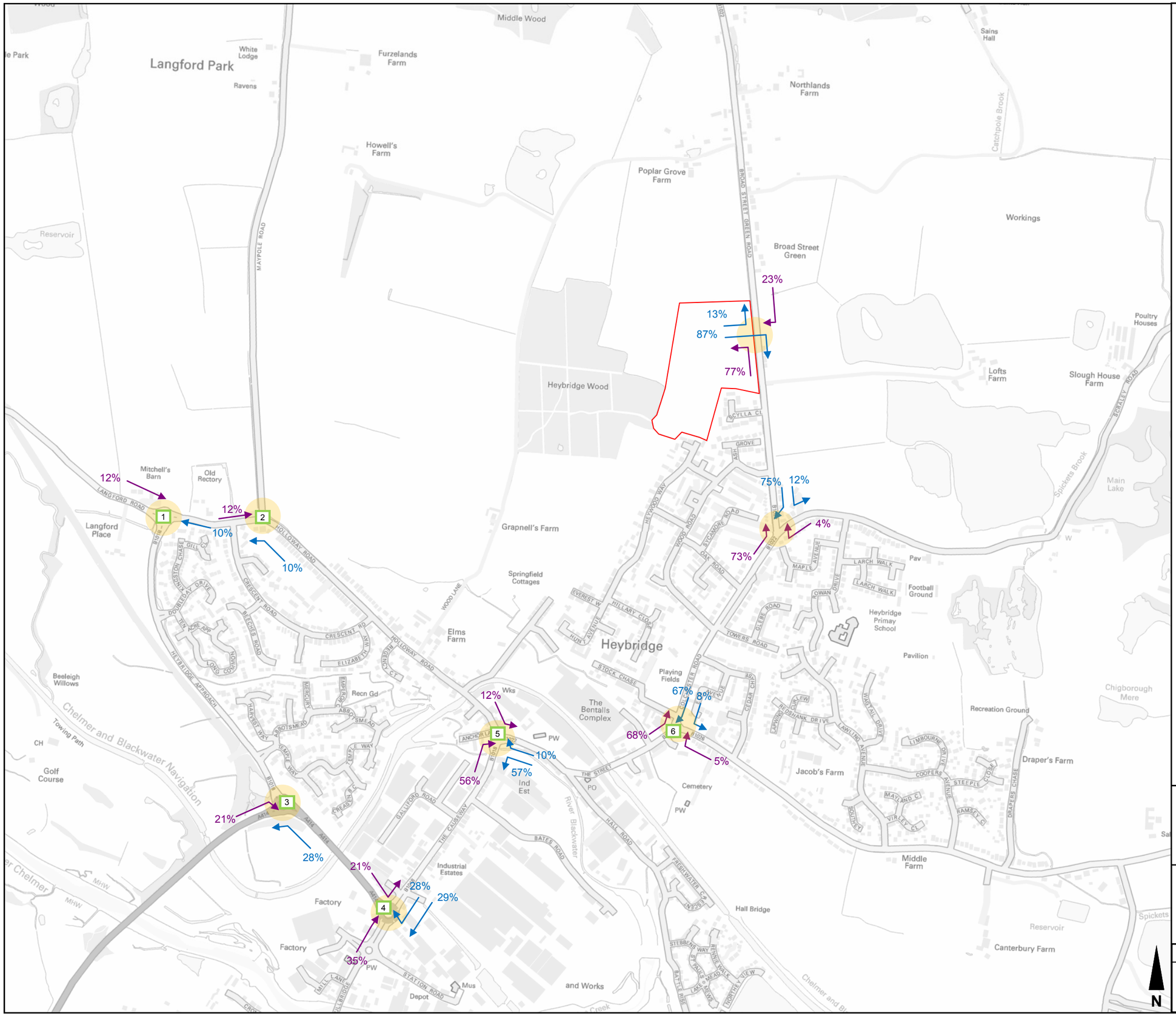

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow
- 1 Junction Reference

PM Peak Survey Distribution

Figure 2.4

NOT TO SCALE

URS

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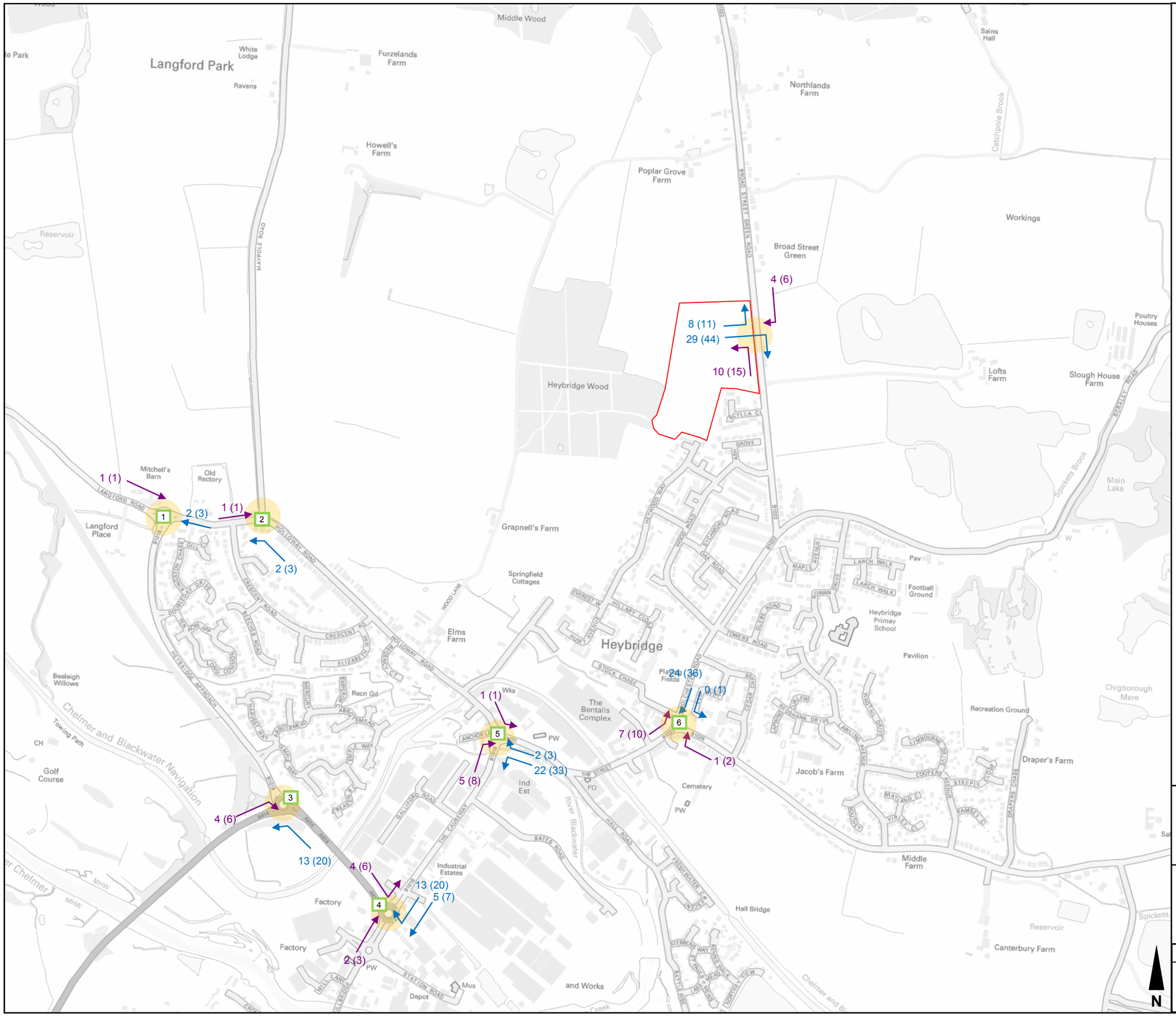

KEY

Site Boundary

Junction

X (X) → Inbound Flow

← X (X) Outbound Flow

100 units 150 units

1 Junction Reference

AM Peak Development Flows (ECC Distribution)

Figure 2.5

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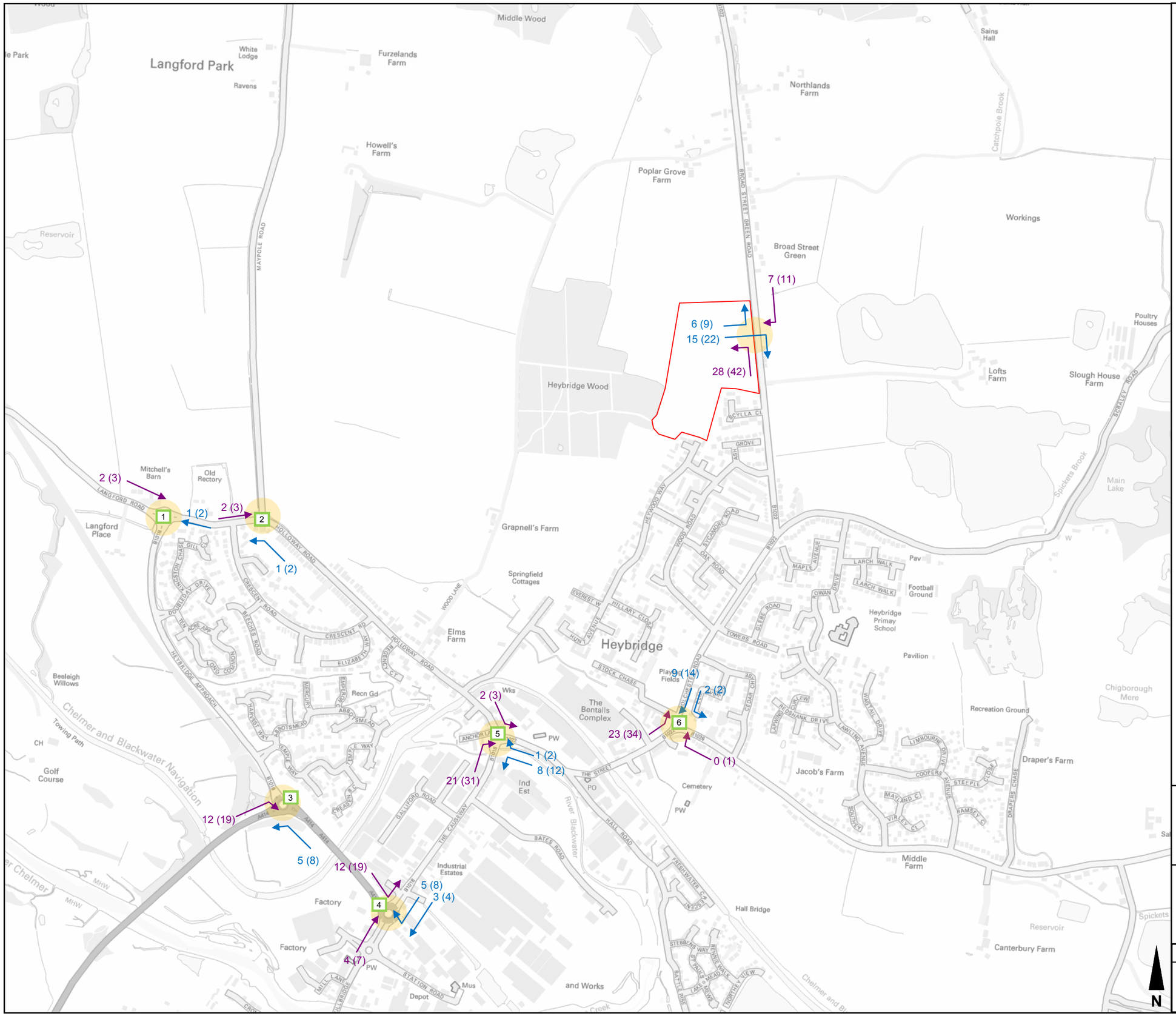

KEY

Site Boundary

Junction

X () Inbound Flow

X () Outbound Flow

100 units 150 units

1 Junction Reference

PM Peak Development Flows (ECC Distribution)

Figure 2.6

NOT TO SCALE

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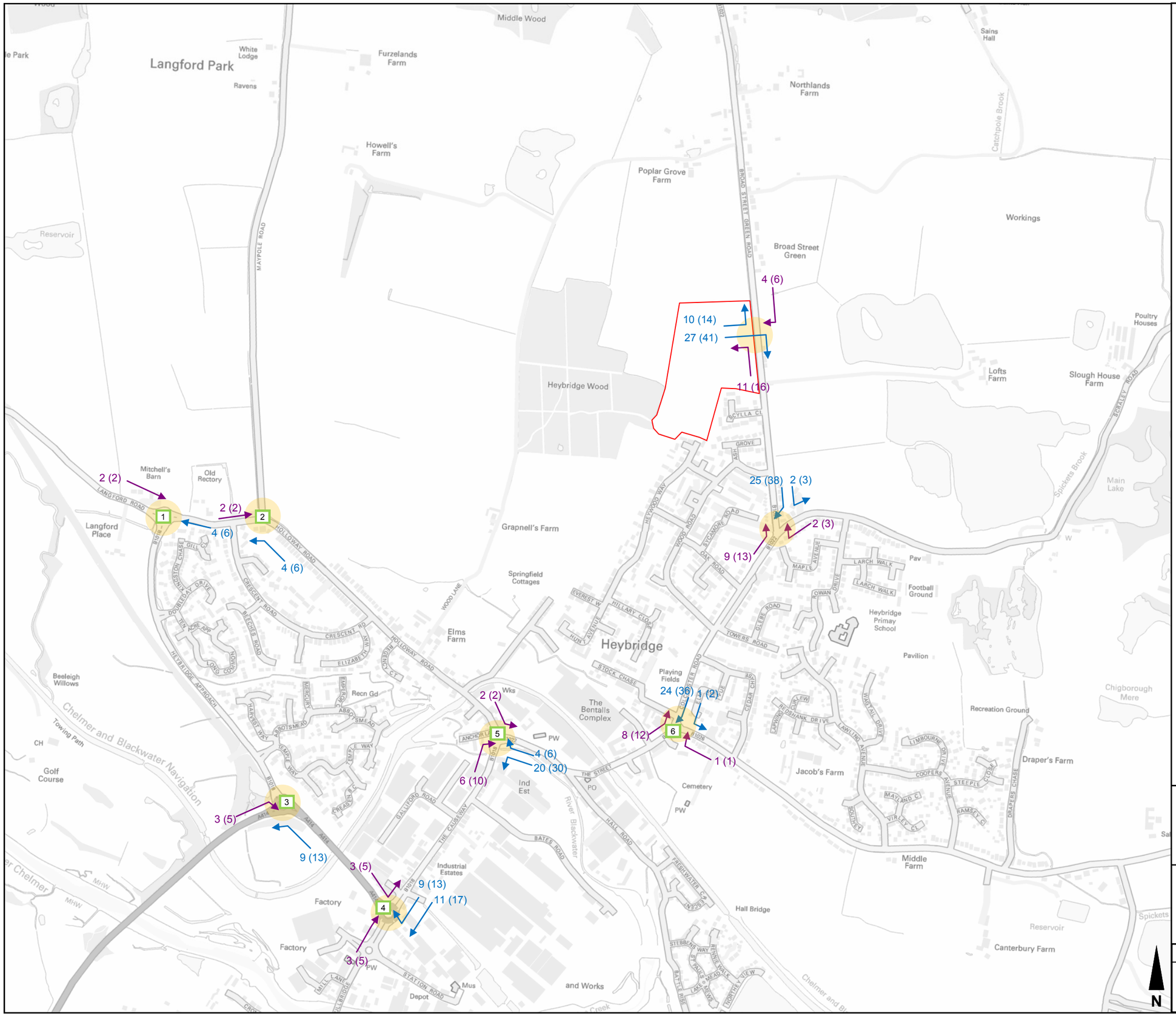

KEY

Site Boundary

Junction

X (X) → Inbound Flow

← X (X) Outbound Flow

100 units 150 units

1 Junction Reference

AM Peak Development Flows
(Survey Distribution)

Figure 2.7

NOT TO SCALE

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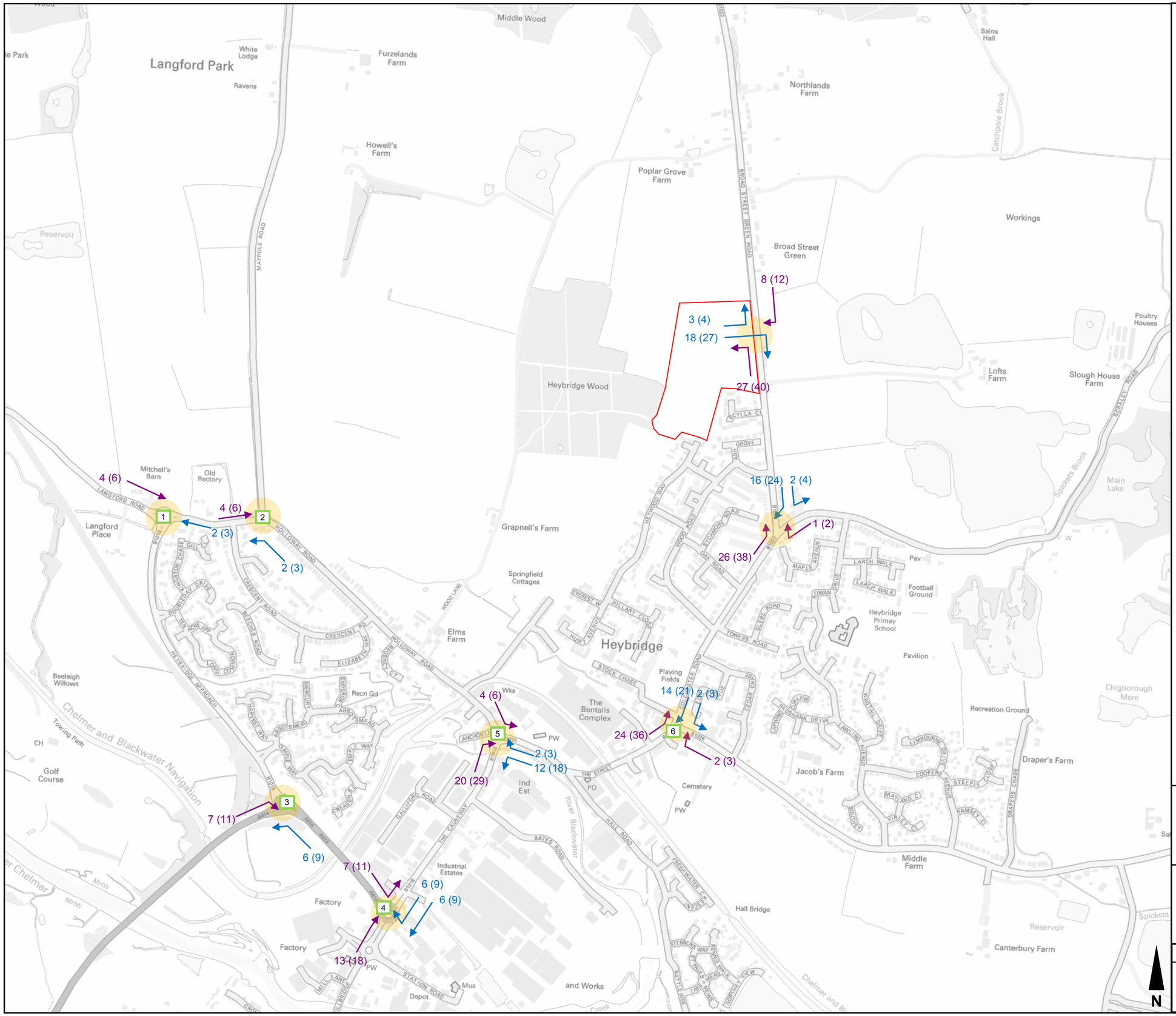

KEY

Site Boundary

Junction

X (X) → Inbound Flow

← X (X) Outbound Flow

100 units 150 units

1 Junction Reference

PM Peak Development Flows
(Survey Distribution)

Figure 2.8

NOT TO SCALE

URS

3 TRIP GENERATION AND DISTRIBUTION (WITH LINK ROAD)

3.1 Background

3.1.1 As part of the North Heybridge Masterplan, a link road spanning approximately 2km is likely to be delivered. It is understood that connection from the existing road network to the link road will be provided by a new roundabout on Broad Street Green Road, south of Poplar Grove Chase and to the north of the Broad Street Green Road site, and via a new roundabout to the west of the Heybridge Approach / Langford Road roundabout.

3.1.2 The delivery of the link road will allow existing traffic using Broad Street Green Road and travelling between the B1019 or A414 to bypass Heybridge centre. It will also provide emerging development, such as land to the west of Broad Street Green, an alternative route to connect with the wider area.

3.1.3 Initial feedback from ECC, indicated that access from land west of Broad Street Green Road should be taken from the link road. However, for a number of reasons, as outlined in **Chapter 2**, Persimmon Homes require a separate access to their site from Broad Street Green in order to bring the site forward.

3.1.4 ECC's potential location for access from the link road is reflected in the local area spreadsheet model developed by ECC to support the appraisal of potential core strategy sites. In the model access to land west of Broad Street Green Road is anticipated from a fourth arm of the proposed Broad Street Green Road/link road roundabout, with the other arms serving the link road and Broad Street Green Road North and South.

3.1.5 Designs presented by Countryside at a transport working group meeting of the 7th February 2014, show that the location of the roundabout will be approximately 400m to the north of Persimmon Homes preferred access location. Assuming a speed of 30 mph or 48 km/hour, this is a difference of approximately 30 seconds in travel time. This includes no allowance for the relative time or distance that may be saved, given that access from the link road will still require vehicles to travel north from the site through internal North Heybridge residential roads.

3.1.6 Even if the access to the link road was taken to the west directly from the link road, rather than the roundabout, then differences in travel times are still likely to be marginal, given the slower internal road speeds compared to using Broad Street Green Road and the link road.

3.1.7 This chapter gives examination to the distribution of trips arising from the proposed Broad Street Green site with the link road in place.

3.2 Methodology

3.2.1 With minimal differences in travel time and distance expected between an access on Broad Street Green Road or via an alternative access from the link road, it is suggested that there would be negligible difference in regards to trips assigning to the link road. This is on the basis that travel times would not differ significantly, as residents would still benefit from reduced delays and congestion alongside more consistent speeds through using the link road than if they were travelling through Heybridge. As such, it is suggested that similar distributions would be delivered irrespective of whether access is taken from Broad Street Green Road or the link road.

3.2.2 ECC's link road distribution has therefore been taken forward to consider the level of trips travelling from the proposed site through Heybridge. The only difference to the methodology, akin to the previous chapter, is that it is expected that more trips than currently assigned in the ECC model, would travel north on Broad Street Green Road to access the wider area and links such as the A12. With the link road in place, it is estimated that a 50/50 split would exist for trips travelling to Zone 25 between Broad Street Green and the B1019, with the link road used to connect with the latter.

3.2.3 **FIGURES 3.1** and **3.2** summarise the calculated percentage splits at each of the junctions in the AM and PM peaks respectively.

3.3 Trip Assessment

3.3.1 The forecast trip levels for the 100 and 150 unit scenarios are identical to those shown in **Tables 2.2**. The trip levels have been applied to the distribution to calculate estimated trip levels by junction, with the results shown in **Figure 3.3** and **3.4** for the AM and PM peaks respectively. **Table 3.1** summarises the traffic increases by junction following the introduction of the link road.

Table 3.1: Trip Distribution Summary by Junction

Ref	Junction	100 Units		150 Units	
		AM (vehicles)	PM (vehicles)	AM (vehicles)	PM (vehicles)
1	Langford Road / Heybridge Approach	18	19	27	29
2	Maypole Road / Holloway Road	0	0	0	0
3	A414 Roundabout	18	19	27	29
4	The Causeway / Fullbridge	5	5	7	7
5	The Street / The Causeway	9	9	14	14
6	Goldhanger Road / Colchester Road	10	11	17	17

3.3.2 Examination of the flows shown in **Table 3.1** compared to the without link road results shown in **Table 2.4**, indicate that the introduction of the link road will increase flows at the Langford Road / Heybridge Approach roundabout and at the A414 roundabout, as traffic uses the link road and then either Langford Road or the B1019 to divert around Heybridge.

3.3.3 Due to the link road, flows at junction 2, as well as junctions 4 to 6 which form busy local junctions reduce. Coupled with this, it is expected that the introduction of the link road will allow existing through traffic to bypass the Heybridge area, thereby further alleviating pressure. Although as the majority of development takes place at the North of Heybridge development site beyond the five year housing supply period, traffic levels at these junctions will rise again by 2026, resulting in a nil detriment scenario according to results presented in ECC's (2014) transport evidence report entitled 'Reallocation of 335 Dwellings from South Maldon to Heybridge'.

3.3.4 However, the key point is that any increases in traffic associated with the delivery of the Broad Street Green development are unlikely to be severe in the interim, and will reduce at key local junctions following the opening of the link road. Furthermore, the greatest increase at key local junctions such as The Street / The Causeway or Goldhanger Road / Colchester Road will occur at a point when additional development is limited and largely concentrated to the west, thereby controlling any additional pressure on Colchester Road junctions during this period.

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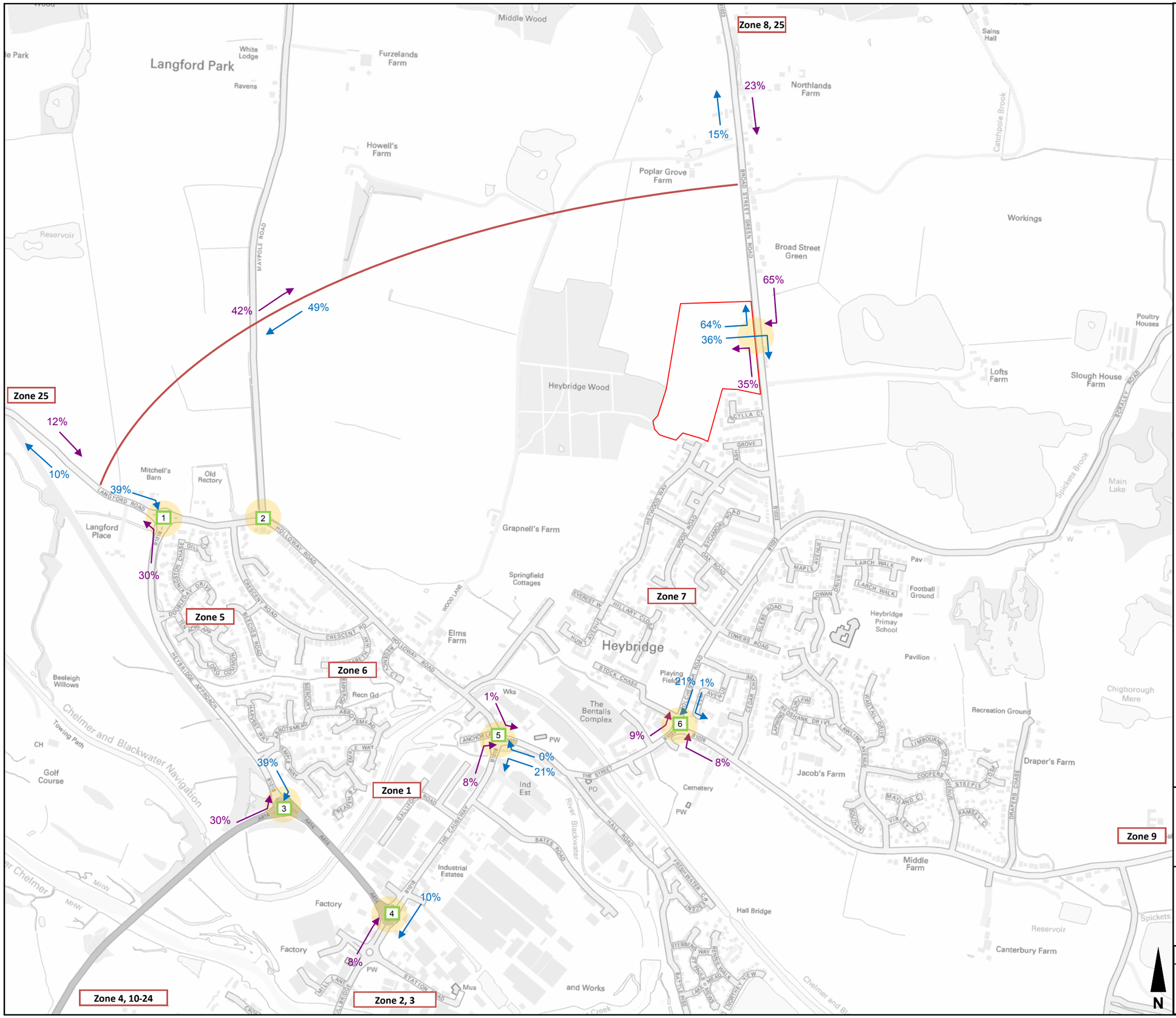

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow
- Link Road (Indicative)
- 1 Junction Reference
- Zone X 2001 Census Journey to Work Zone

AM Peak ECC Distribution with Link Road

Figure 3.1

NOT TO SCALE

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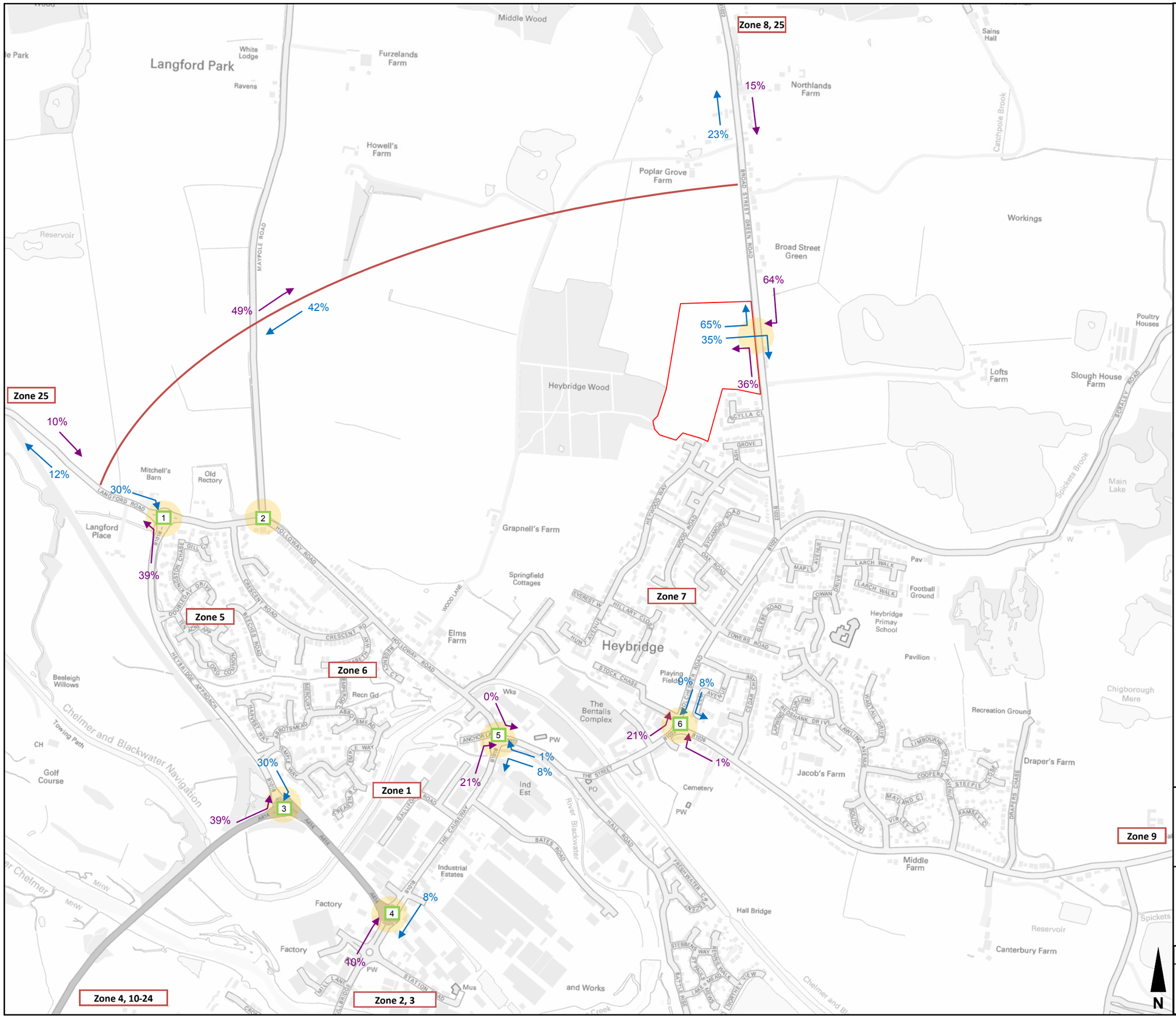

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow
- Link Road (Indicative)
- 1 Junction Reference
- Zone X 2001 Census Journey to Work Zone

PM Peak ECC Distribution with Link Road

Figure 3.2

NOT TO SCALE

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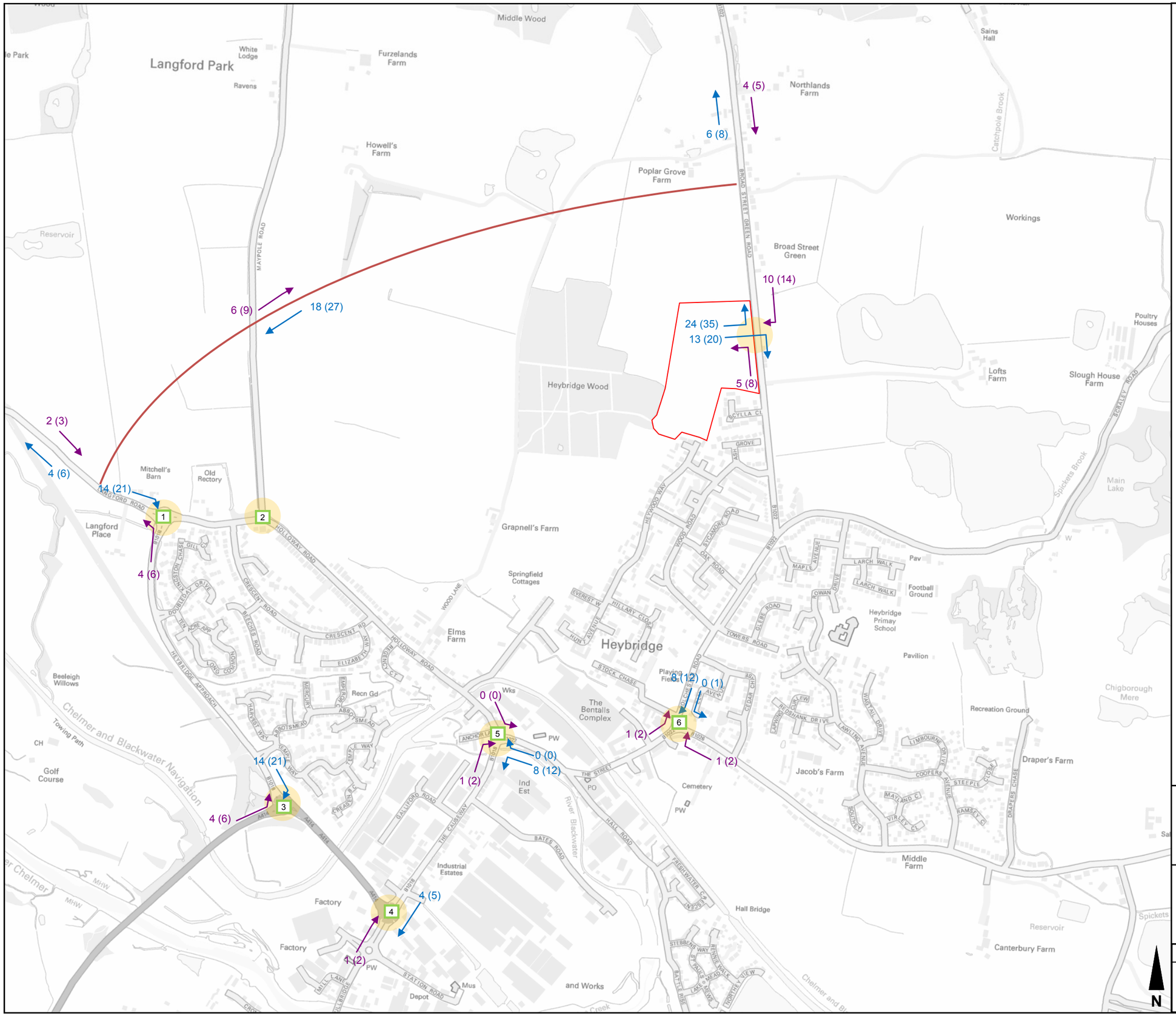

KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow (100 units / 150 units)
- Link Road (Indicative)
- 1 Junction Reference

AM Peak Development Flows with Link Road

Figure 3.3

NOT TO SCALE

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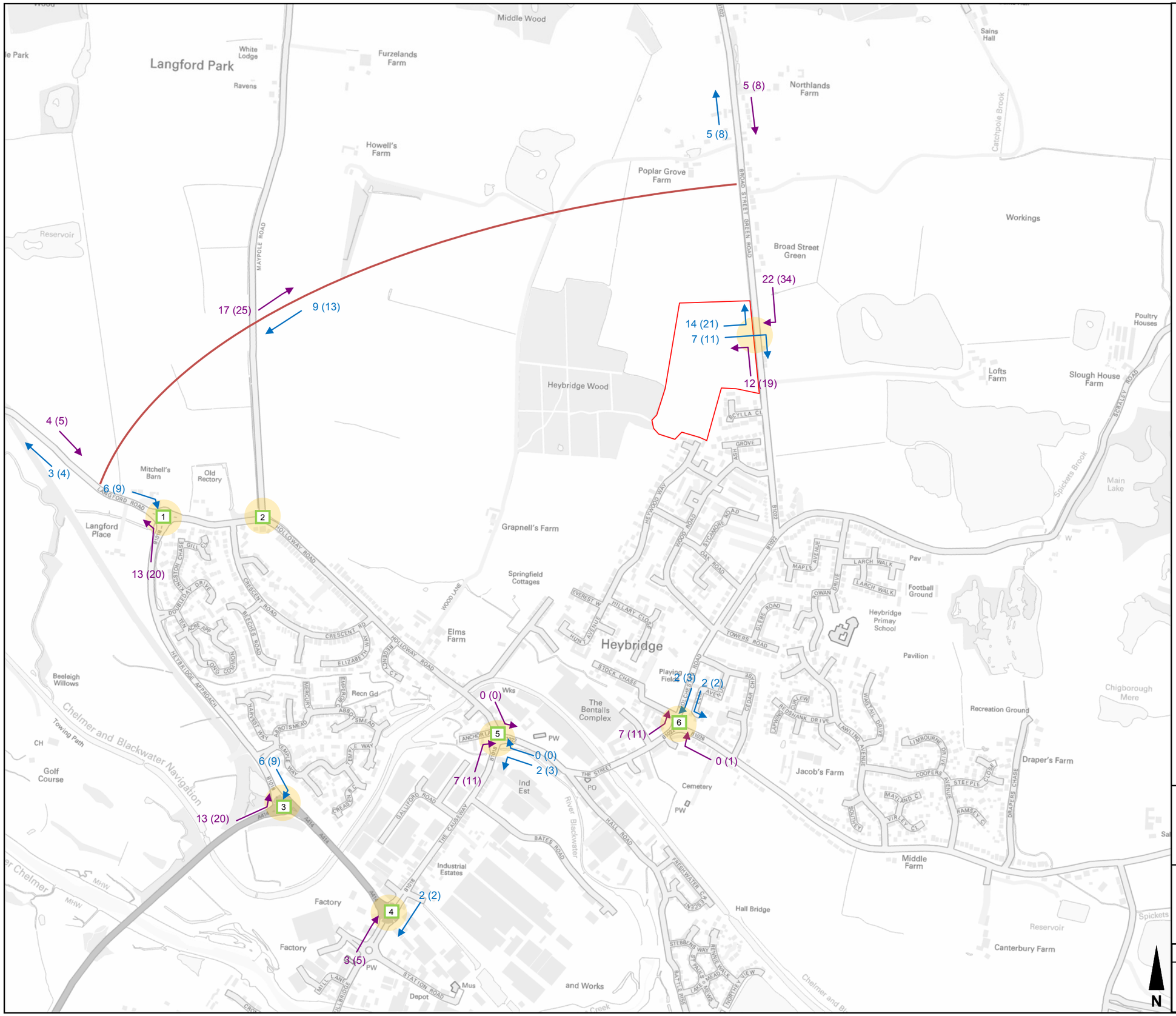


KEY

- Site Boundary
- Junction
- 25% → Inbound Flow
- ← 25% Outbound Flow (100 units / 150 units)
- Link Road (Indicative)
- 1 Junction Reference

PM Peak Development Flows with Link Road

Figure 3.4

NOT TO SCALE

URS

4 CONCLUSION

4.1.1 This report has been prepared to consider the distribution of trips generated by land west of Broad Street Green prior to and following the potential delivery of the link road. Its principle purpose has been to appraise the impacts of delivering an access from Broad Street Green Road.

4.1.2 It has been set out that the delivery timeframes for the link road and internal roads connecting to the Broad Street Green Road site are uncertain and are likely to be dependent on a number of factors, including funding streams and development triggers associated with the allocation at land North of Heybridge.

4.1.3 The delivery of an independent access for land west of Broad Street Green Road is therefore considered imperative in safeguarding the deliverability of the site and supporting five year housing supply targets, as well as ensuring that the development is appropriately integrated with the existing Heybridge area and community.

4.1.4 ECC has previously expressed a preference that access from Broad Street Green Road should be taken from Broad Street Green Road, in order to support the assignment of trips from this small development to the link road. However, as discussed the travel distance and time between the proposed access on Broad Street Green Road and access from the link road would be marginal. Therefore it is not considered that this would affect the assignment of trips to the link road once this opens, given the advantages of this route.

4.1.5 To provide funding for the link road and to support housing delivery targets, it is likely that developments such as Broad Street Green Road will need to come forward before the delivery of the link road. As shown by the assessment, in the interim this means that more trips from land west of Broad Street Green Road will use Colchester Road then compared to when the link road is in place. However, even with delivery of 150 units at the site, a maximum of 38 trips would be expected on any approach within Heybridge, which equates to only one additional vehicle every one minute and 35 seconds.

4.1.6 Furthermore, any increase in trips would occur at a time when development associated with land at North Heybridge and at land north of Holloway Road is occurring to the north west of the town, with access taken from Langford Road/Heybridge Approach and Holloway Road respectively. Therefore, additional pressure from other development at junctions such as Colchester Road/Goldhanger Road is likely to be limited, and likely to be removed once the link road is in place.

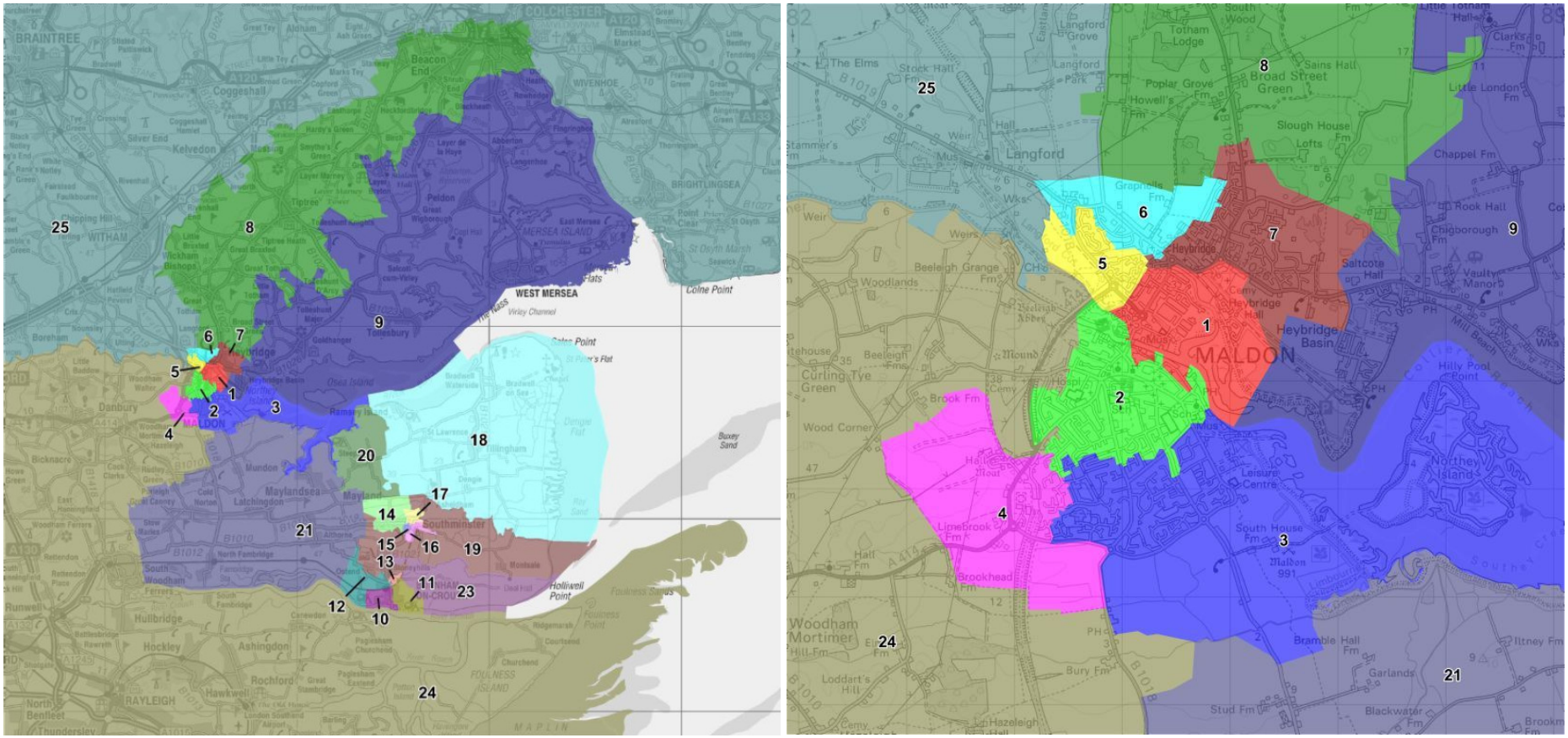
4.1.7 Upon opening the link road, it is anticipated that traffic will redistribute to use the route around Heybridge, thereby reducing the number of trips using Colchester Road associated with land west of Broad Street Green Road. This will principally affect those travelling west to connect with the B1019 or south towards areas such as Maldon, via routes such as the A414. Increased traffic associated with land west of Broad Street Green will pass through junctions such as Langford Road / Heybridge Approach and the A414 roundabout as a result.

4.1.8 Overall, it is therefore concluded that there is reasonable evidence to support the argument for the delivery of an independent access from Broad Street Green Road for the site. This is on the basis that there would be minimal difference in assignment between an access from Broad Street Green or the link road, and that an independent access is needed to safeguard the delivery of the site, so that housing can be brought forward within the first five years of MDC's LDP to assist housing supply.

Appendix A

2001 Census Journey to Work Zoning System (transport evidence for Local Development Plan)

Source: 'Assessment of Impact of Proposed Development Sites on Existing Junctions' (Mouchel and ECC, December 2010)



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Wormald Burrows Partnership Limited

Civil Engineering Consultants

BROAD STREET GREEN ROAD, HEYBRIDGE

SURFACE WATER DRAINAGE AND FLOOD RISK STATEMENT

MARCH 2014

0163-5374-S4-1234

LAND ADJACENT TO BROAD STREET GREEN ROAD, HEYBRIDGE

SURFACE WATER DRAINAGE AND FLOOD RISK STATEMENT

Client: Persimmon Homes Essex Ltd

Engineer: Wormald, Burrows Partnership Limited

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Original Date: Mar 2014

Original WBP Ref: E3026/DRAINAGE&FLOOD RISK MAR 2014 Rev0

Written By:	Checked By:	Approved By:
.....	.....	.....
Nick Kohli *Director*	Tom Wilson *Associate Director*	Nick Kohli *Director*

REGISTRATION OF AMENDMENTS

Revision	Date	Amendment Details	Prepared by	Checked by
0		Draft	Nick Kohli	

CONTENTS

APPENDICES

1 INTRODUCTION

1.1.1 Wormald Burrows Partnership Limited (WBPL) has been commissioned by Persimmon Homes Essex Ltd to provide a statement regarding drainage and flood risk for a proposed residential development on land adjacent to Broad Street Green Road, Maldon, Essex.

1.1.2 The proposed development consists of approximately 140 residential units with associated access roads, parking, landscaped areas and gardens.

1.1.3 The information used in this report is based on a review of British Geological Survey (BGS) borehole data, Environment Agency mapping, a Geo-environmental Investigation by Ken Rush Associates, Anglian Water sewer records, a Strategic Flood Risk Assessment for Mid Essex prepared by Scott Wilson and a Surface Water Management Plan prepared for Maldon District Council by Capita Symonds.

1.1.4 The report assesses the site's characteristics and the existing means of managing surface water runoff. Risks of flooding are highlighted and proposal for managing these risks outlined.

2 EXISTING SITE CONDITIONS

2.1 Site description and characteristics

2.1.1 The site is approximately 6.62 ha and is situated on agricultural land to the north of Maldon and Heybridge and is currently used for arable farming. The image below shows the boundary of the site. A review of historical records confirms that the site has been an open field since records began.

2.1.2 The site is generally flat, with a slight fall from the northern boundary to the southern boundary at an approximate gradient of 1 in 600. The site also falls from Broad Street Green Road to the south. High levels along the northern and eastern boundary are around 7.1m AOD. The low point of the site has a level of 5.51m AOD which is situated at the southwest corner. Across the whole site there is a level difference of less than one metre.

2.1.3 An existing ditch runs along the eastern edge of the site, parallel to Broad Street Green Road. The ditch terminates at a retaining wall to the north and to the south follows the site boundary until it meets existing houses. Another ditch exists along the north and eastern

edge of Heybridge Wood. This ditch appears to follow the edge of the wood southwards into the site, it then follows the southern site boundary eastwards until it terminates at the low point of 5.51m AOD.

2.1.4 A Geo-environmental Investigation carried out by Ken Rush Associates has established that existing ground conditions comprise a thin layer of surface deposits overlying mainly sands and gravels to a depth of 0.9m below ground Beneath this strata are varying depths of clay. Groundwater was variable but generally encountered at 2.0m below ground level. Soakage tests were carried out and results demonstrate that sustainable infiltration based drainage solutions are viable.

2.1.5 An assessment of historic site uses has found that underlying soils are unlikely to have levels of contamination which could pose a risk to human health.

2.2 Existing surface water management

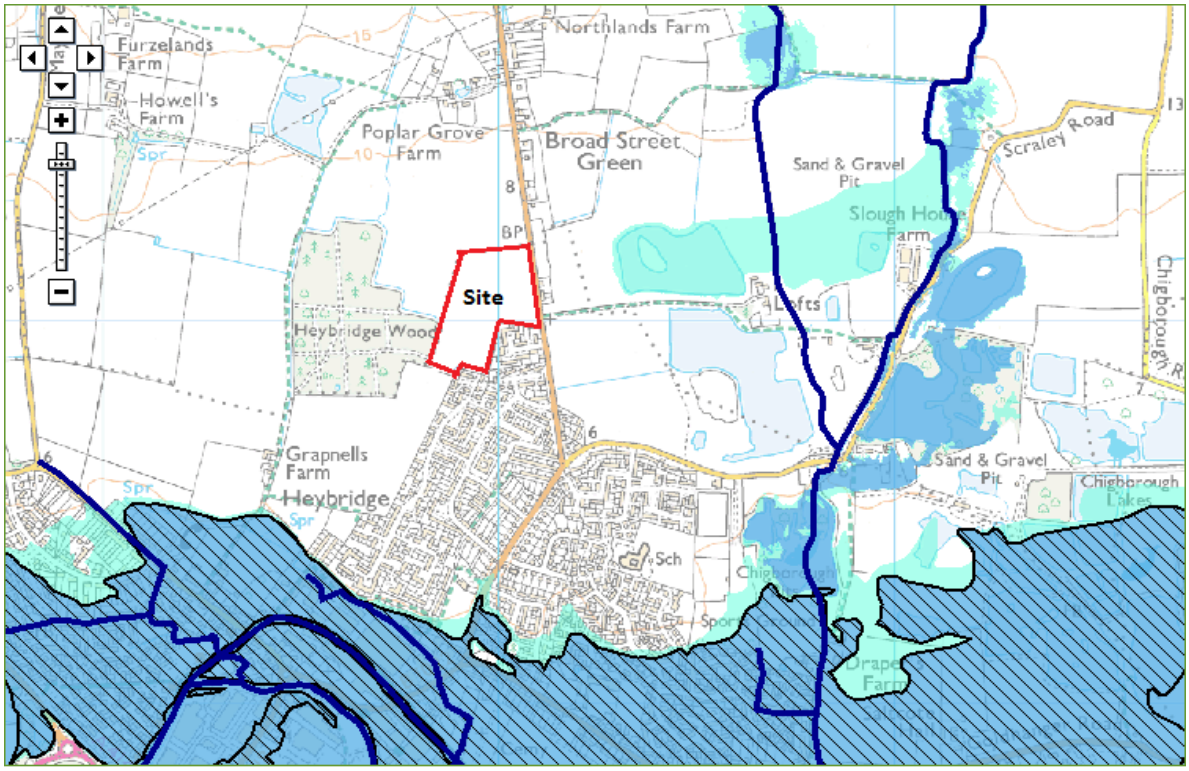
2.2.1 A review of the Anglian Water services records indicate that there are no existing public sewers within the site boundary. Existing public surface water and foul sewers do exist in the housing estate just south of the site along Scylla Close, Ash grove and Wood Road. There is also an existing public foul sewer that runs the length of Broad Street Green Road.

2.2.2 As there are no existing sewers, surface water runoff will dissipate via infiltration and evapo-transpiration. Only in extreme rainfall events will surface water runoff be observed and based on the relatively flat topography of the site, any resultant flow is likely to gravitate from the high points at the north and east towards the southern boundary, making use of the existing ditches as flow paths.

3 FLOOD RISK

3.1.1 The EA's flood mapping (see below) and the Mid Essex Strategic Flood Risk Assessment shows the site to be located within an area having less than a 1 in 1000 annual probability of fluvial flooding; hence placing the site within Flood Zone 1 i.e. low probability of flood risk.

3.1.2 The National Planning Policy Framework (NPPF) identifies that more vulnerable development, such as dwelling houses, are appropriate in Flood Zone 1.



3.1.3 There are no other large developments planned near the site that could have a bearing on the flood risk of the site.

3.1.4 Some small developments (less than 10 units) have been proposed for land adjacent to the east of Broad Street Green Road; next to the row of cottages that already exist directly opposite the site. The developments are small enough not to influence the flood risk of the site.

3.2 Strategic Flood Risk Assessment (SFRA)

3.2.1 A Strategic Flood Risk Assessment was carried out by Scott Wilson (October 2007) on behalf of Mid Essex Councils: Braintree District Council, Chelmsford Borough Council, Colchester Borough Council, Maldon District Council.

3.2.2 The key objectives of the SFRA are to map all forms of flood risk and use this to locate new development primarily in low risk areas. The report deals mainly with tidal and fluvial sources of flooding.

3.2.3 The SFRA primarily considers tidal and fluvial sources of flooding and as such defers to more local flooding assessments for other sources of flooding, such as surface water runoff, smaller watercourses, groundwater and sewers.

3.2.4 The Maldon and Heybridge Surface Water Management Plan (SWMP), investigates these areas of flooding in more detail and is discussed below.

3.3 Maldon and Heybridge Surface Water Management Plan (SWMP)

3.3.1 The Surface Water Management Plan for Maldon and Heybridge was prepared by Capita Symonds for Maldon District Council and Essex County Council dated October 2013.

3.3.2 It outlines the predicted risk and surface water management strategy for Maldon and Heybridge. The report assesses flood sources including; pluvial, ordinary watercourses, groundwater and sewers, using a number of data sources and TUFLOW software to undertake flood modelling.

3.4 Potential Sources of Flooding

3.4.1 The NPPF and SFRA identifies six potential sources of flooding:-

- Flooding from rivers (fluvial flooding);
- Flooding from the sea (tidal flooding);
- Flooding from land;
- Flooding from sewers;
- Flooding from groundwater; and
- Flooding from reservoirs, canals, and other artificial sources.

These have each been assessed and the only source requiring further consideration is 'Flooding from land'.

Flooding from Land

3.4.2 The Maldon and Heybridge Surface Water Management Plan (SWMP) highlights the potential for flooding at the southern end of the site due to runoff from the site and land to the north. Modelling from the report identifies the site as being within a Critical Drainage Area (CDA). The CDA is classed as an area at significant risk where flooding will affect properties, businesses and/or infrastructure. The report states that overland flow from the upstream rural catchment will be conveyed to the urban area and flow through the site impacting residential properties along Scylla Close (**Appendix A**).

3.4.3 During the site investigation works in May 2012, some ponding was observed in the south east corner of the site. The site team noted that this was likely to be caused or exacerbated by the filling of the ditch alongside the B1022.

3.4.4 The SWMP outlines a proposed strategy for dealing with potential flooding (**Appendix B**).. It recommends run-off is directed to the southern end of the site through the use of swales, where it can be attenuated in a detention basin/ wetland. It states that further 'resilience' can be added if this proves to be insufficient.

4 SURFACE WATER MANAGEMENT

4.1 Surface water drainage

4.1.1 The NPPF and Building Regulations: Part H recommend the use of sustainable draineg systems (SuDS) as the primary method for the disposal of surface water at source, followed by discharge to watercourse and lastly connection to a public sewer.

4.1.2 Soakage rates obtained from site testing indicate that infiltration based drainage solutions are viable and it is therefore proposed that surface water runoff is managed using a combination of the following SuDS techniques.

- Swales/ Ditches
- Permeable paving
- Rain Gardens
- Geocellular Soakaways

4.1.3 Surface water from roads will be predominantly managed by Rain Gardens situated in the verges adjacent to the roads. Rain gardens are planted areas of soil/gravel material that allow rainwater to infiltrate into the ground, be taken up by vegetation and also lost back to the air by evapo-transpiration. It essentially mimics the natural greenfield environment.

4.1.4 Rain gardens are a natural way of dealing with surface water runoff and the vegetation also facilitates the removal of many of the pollutants associated with road runoff.

4.1.5 Surface water from roofs will be managed by geocellular soakaways located in the gardens of plots. Rainwater will be conveyed to these using a piped system. It is important to locate soakaways 5m away from any building so that infiltration does not interfere with the building foundations.

4.1.6 Permeable paving will be used in private areas.

4.1.7 The existing ditches around the site will be maintained and further ditches will be dug in order to provide a route for existing surface water and surface water generated by the development. These will be constructed as infiltration trenches so that water infiltrates through the base of the trenches.

4.1.8 The risk of overland flows from land north of the site is acknowledged and consequently, infiltration trenches will be installed to the northern and western sit boundaries to intercept

any overland such flows. The risk of these flows will therefore be managed by these trenches, which will be designed to dispose of resultant runoff through infiltration.

4.1.9 The surface water drainage system will be designed to accommodate all storms up to and including the1:10 year event plus a 30% allowance for climate change. This will provide significant betterment over the current situation where over land flows from outside the site and flows from the site itself are able to flow freely across the site and accumulate in at the lowest point in the southern corner.

4.1.10 Catchpits and silt buckets will be installed to prevent soakaways silting up. Appropriate pollution controls will also be installed to ensure there is no detrimental effect to the environment.

4.2 Management of Risks

4.2.1 A management company will be set up to maintain the private infrastructure. The company will perform regular checks and maintenance on the drainage system to ensure it continues operating for the lifetime of the development.

4.3 Climate Change

4.3.1 Climate change will mean more intense storm events. This will be allowed for in the design by having the system designed to manage a 1 in 100 year event plus 30%.

5 CONCLUSIONS

5.1.1 The 6.62ha site is located north of the towns Maldon and Heybridge and the proposed development consists of approximately 140 residential units.

5.1.2 An assessment of the potential flood risks was carried out making use of data from various relevant surces. The assessment found that the site is entirely located within Flood Zone 1; this being the zone at least risk of flooding and therefore acceptable for residential use. However, the SWMP did highlight the potential for flooding at the southern end of the site.

5.1.3 Tests have demonstrated that infiltration is viable and thus SuDS can be used to manage surface water runoff.

5.1.4 The proposed drainage system will make use of a number of SuDS features. Rain Gardens will manage flows from the adoptable road and footways. Permeable paving will manage surface water from private driveway areas. Geocellular soakaways located in back gardens will manage flows from roofs.

5.1.5 Existing swales/ditches will be maintained and further swales and infiltration tenches will be installed to intercept overland flows and runoff from areas within the site.

5.1.6 The surface water drainage system will be designed for a 1 in 100 year event plus a 30% allowance for climate change.

5.1.7 The proposed surface water drainage system will not only manage surface water runoff generated by the development but will also accommodate any excess overland flows from land to the north, highlighted by the SWMP.

5.1.8 This approach will reduce the risk of flooding from significant events when compared to the current situation, thereby reducing the current risk of flooding to third parties.

5.1.9 A management company will be appointed to maintain the private drainage systems.

APPENDIX A

CDA 05 – Heybridge Wood Area

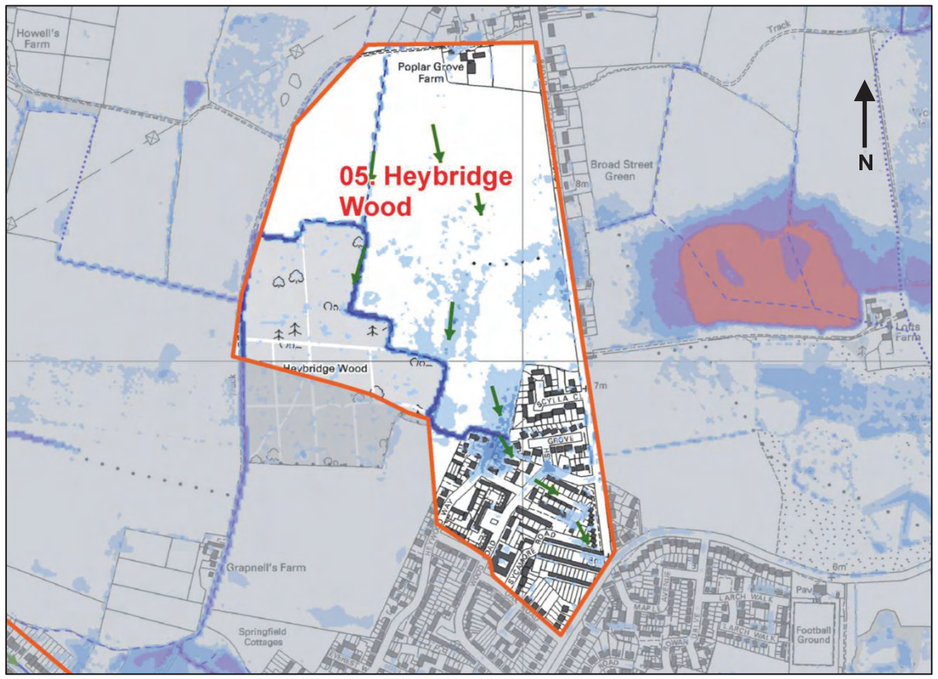


Figure 4-10 CDA 05 - 1 in 100 year Depth Results

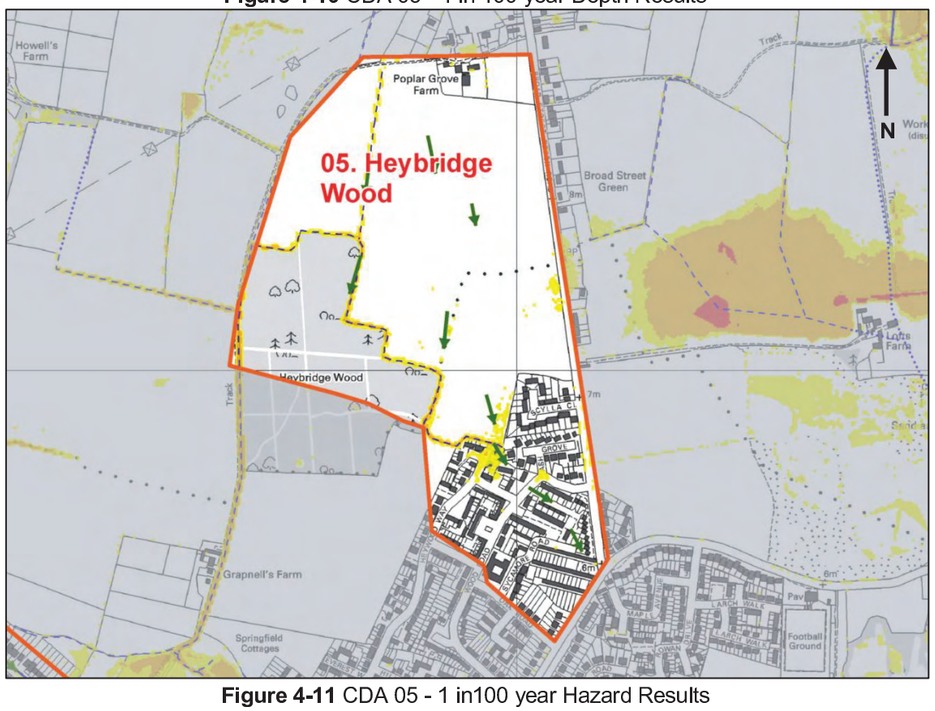


Figure 4-11 CDA 05 - 1 in100 year Hazard Results

Summary of risk:

This CDA is located in the north Heybridge . The pluvial modelling predicts that overland flow from the upstream rural catchment will be conveyed into the urban area and flow through the CDA impacting residential properties. The greatest risk of surface water flooding is at the interface between urban and rural zones where ponding is predicted to occur due to a topographic change in elevation.

No fluvial flood zones are located within the CDA.

Table 4-5 Summary of local flood risk within the CDA 05 – Heybridge Wood Area

Flood Classification/ Type	Source	Pathway	Receptor
Overland flow	Surface water runoff from two overland flow paths convey runoff into the LFRZ.	Runoff form from the northern upper catchment is are conveyed down a an open channel but could flood properties if the inlet is overwhelmed.	Residential properties, gardens and roads
Ponding of surface water (within topographic low spots)	Natural valleys, depressions and topographic low spots.	There are main are of ponding is within Heywood Way/Ash Grove due to the low (locally) topography of the area	Residential properties adjacent to ponding areas.
Hazard	Predominantly 'low' with some areas of 'moderate' and 'significant' hazards being predicted within the LFRZ.		
Sewer	The drainage network within the CDA is a separated surface water drainage system and is predicted to be flowing at capacity during the peak of the storm event.		
Validation	Three historic records are located within the CDA.		
Groundwater	The majority of the urbanised portion of the CDA is highlighted to have a 'very high' susceptibility to groundwater flooding (due to superficial deposits) and is also located above a minor aquifer. The upper rural portions of the CDA are at a 'moderate' risk of groundwater flooding.		

CDA 05 – Heybridge Wood Area

Preferred Option:

- Investigate the benefits of directing runoff (preferential flow path) into a flood storage area (bioretention basin / detention basin / wetland) located upstream of where the ordinary watercourse is culverted;
- Obtain survey information for the drainage system and confirm all elements are included within the model that might influence flood risk;
- Improved land management for upstream catchment areas;
- If risk is still predicted after the above to options are implemented, then included resistance measures for properties identified to be at greatest risk; and
- Promote the use of rainwater harvesting and water butts throughout the catchment.

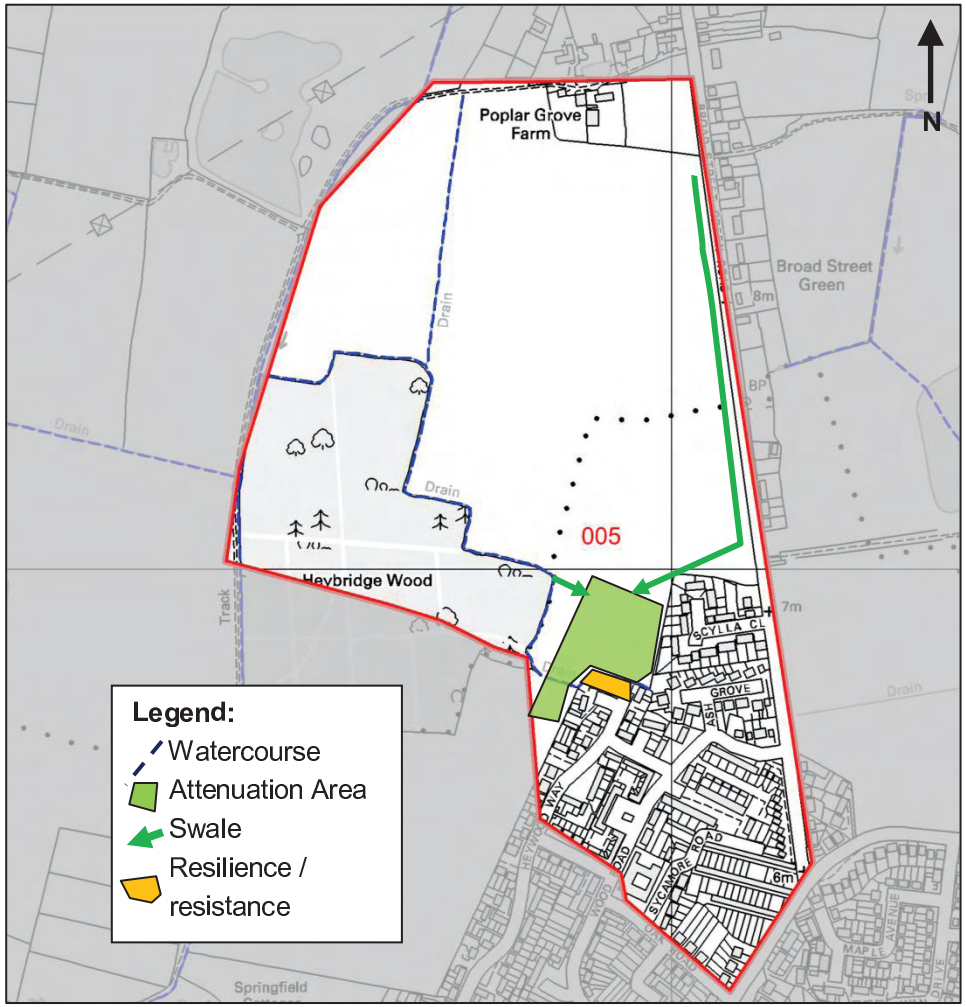


Figure 5-9 Preferred Options CDA 05 – Heybridge Wood Area

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