September 2016 | JR | CAM.0970

DACORUM BOROUGH COUNCIL
SITE ALLOCATIONS DPD EXAMINATION IN PUBLIC

MATTER 6 STATEMENT
GENERAL SITE SPECIFIC ISSUES

LAND SOUTH-EAST OF HOMEFIELD, BOVINGDON

ON BEHALF OF TAYLOR WIMPEY

TOWN & COUNTRY PLANNING ACT 1990 (AS AMENDED)
PLANNING AND COMPULSORY PURCHASE ACT 2004

Pegasus Group

Suite 4 | Pioneer House | Vision Park | Histon | Cambridge | CB24 9NL

T 01223 202100 | **W** www.pegasuspg.co.uk

Birmingham | Bracknell | Bristol | Cambridge | Cirencester | East Midlands | Leeds | Liverpool | London | Manchester

PLANNING | DESIGN | ENVIRONMENT | ECONOMICS

CONTENTS:

APPENDICES (BOUND SEPARATELY):

1. INTRODUCTION

1.1 These representations are prepared on behalf of Taylor Wimpey which has land interests in land at Homefield, Bovingdon. Taylor Wimpey is promoting the site as an omission site for inclusion in the Site Allocations Development Plan Document (DPD) and has made a series of representations to that document, accompanied by technical evidence in support of the allocation of the site.

1.2 This Matter 6 statement should be read in conjunction with the Matter 4 Statement also submitted in support of the site.

Q1. Are the allocated sites appropriate and deliverable, having regard to the provision of the necessary infrastructure, affordable housing and other facilities, and taking account of environmental constraints?

1.3 As set out in Taylor Wimpey's Matter 4 statement, it is not considered that the allocated site LA6 (Chesham Road) can necessarily deliver the full number of dwellings allocated. Several representors to the Site Allocations and preceding Core Strategy have considered that site LA6 does not realistically have the physical capacity to accommodate the full 60 dwellings without resorting to artificially increased densities and building heights or the provision of minimal public open space. As such it cannot be assumed that the allocated site will be developed in full during the Plan period and without modifications the Site Allocations DPD cannot be considered effective.

1.4

Q3. If there is a need to identify additional land for housing, are the alternative proposals that have been put forward in representations appropriate and deliverable? Have they been subject to sustainability appraisal compatible with that for the Site Allocations DPD and to public consultation?

1.5 Land south-east of Homefield is an appropriate and deliverable site which can accommodate 130 – 175 dwellings, of which up to 61 could be affordable in line with Core Strategy Policy CS19 which requires 35% affordable housing provision on residential schemes.

1.6 Previous representations (including the pre-submission representations of late 2014 of which the Inspector will be aware, and the subsequent Call for Sites submission of early 2015 (see **Appendix 1**)) have highlighted the sustainable location of the site, being within 400-600 metres of Bovingdon's village centre

which provides a broad complement of local services including the primary school, library, village hall, public house, and a variety of shops. Bovingdon itself is well-located for public transport including local bus routes, National Rail services from Hemel Hempstead station and London Underground services from Chesham.

1.7 The access appraisal at **Appendix 2** demonstrates that appropriate vehicular and pedestrian access can be achieved via Homefield (subject to minor carriageway widening), and a secondary/emergency vehicular access can be gained via Yew Tree Drive. This appraisal was updated in July 2016 and includes detailed capacity assessments for key junctions around the site, demonstrating that the junctions are expected to operate within capacity even with the addition of the potential residential development traffic.

1.8 The site is deliverable. It is in single and willing ownership, being promoted by a major housebuilder with the necessary resources and expertise to deliver new housing promptly. There are no known technical constraints which could not be overcome. It is anticipated that a scheme of 130 units could be delivered within two to three years following the grant of planning permission.

1.9 The Council's evidence base documents, including the *Strategic Infrastructure Study 2011* (ID9) and the *Infrastructure Delivery Plan Update 2015* (ID1), suggest there are no substantial infrastructural constraints in Bovingdon that cannot be mitigated against, aside from proportional upgrades which may be required to sewerage, education and health provision.

1.10 As discussed in Taylor Wimpey's Matter 4 statement, the site could be released from the Green Belt with the reassurance that the Council's own Green Belt Review identifies a limited contribution to the Green Belt functions, and a more detailed consideration of the site undertaken by CSa has confirmed this to be the case (see **Appendix 3** for further details).

1.11 Drawing the above matters together, it is clear that land south-east of Homefield offers a credible alternative site for allocation which is well-located for access to local services and public transport, where there are no significant technical constraints to development, and where the site's contribution to the Green Belt functions has already been assessed as limited. Land south-east of Homefield therefore warrants careful consideration for inclusion within the Site Allocations DPD.

1.12 Question 3 requires that those sites being promoted as omission sites have been subject to Sustainability Appraisal and public consultation compatible with that for the Site Allocations DPD. This is a requirement of the Local Planning Authority rather than of promoters; it is an exercise that can and should be carried out at any subsequent Main Modifications process that considers additional allocations.

1.13 It is concluded that land south-east of Homefield presents an opportunity for an additional site allocation which will resolve the soundness concerns we have raised.

APPENDIX 1

Call for Sites Submission
March 2015

APPENDIX 2

Transport Technical Note
i-Transport, July 2016

APPENDIX 3

Landscape and Visual Appraisal and Green Belt Review CSa, March 2015

March 2015 | CAM.0970

RESPONSE TO CALL FOR SITES 2015

FOR

TAYLOR WIMPEY

LAND TO THE SOUTH EAST OF HOMEFIELD, BOVINGDON

Reference: CAM.0970 Date: March 2015

Pegasus Group

3 Pioneer Court | Chivers Way | Histon | Cambridge | CB24 9PT

T 01223 202100 | **F** 01223 237202 | **W** www.pegasuspg.co.uk

Birmingham | Bracknell | Bristol | Cambridge | Cirencester | East Midlands | Leeds | Manchester

Planning | Environmental | Retail | Urban Design | Renewables | Landscape Design | Graphic Design | Consultation | Sustainability

CONTENTS:

1. INTRODUCTION

1.1 This response has been prepared by Pegasus Group on behalf of Taylor Wimpey East Anglia to promote the land to the south east of Homefield, Bovingdon for allocation in the emerging Site Allocations Development Plan Document.

1.2 This report provides updated details regarding this sites suitability and availability for residential development in the immediate future.

2. POLICY BACKGROUND

Core Strategy (September, 2013)

2.2 The Dacorum Borough Council Core Strategy was adopted in September 2013. This identifies that Bovingdon will receive around 130 new homes between 2006 and 2031, of which 60 new homes will come forward from the Chesham Road strategic allocation. There is a need to identify land to supply at least 70 new homes to meet the Core Strategy housing requirement.

2.3 It is noted that an early review of the Council's housing figures is planned to address the difference between the identified target and the actual level of objectively assessed need. This is summarised in the Inspector's Report into the Core Strategy. As such further sites for housing will need to be identified to address the current shortfall.

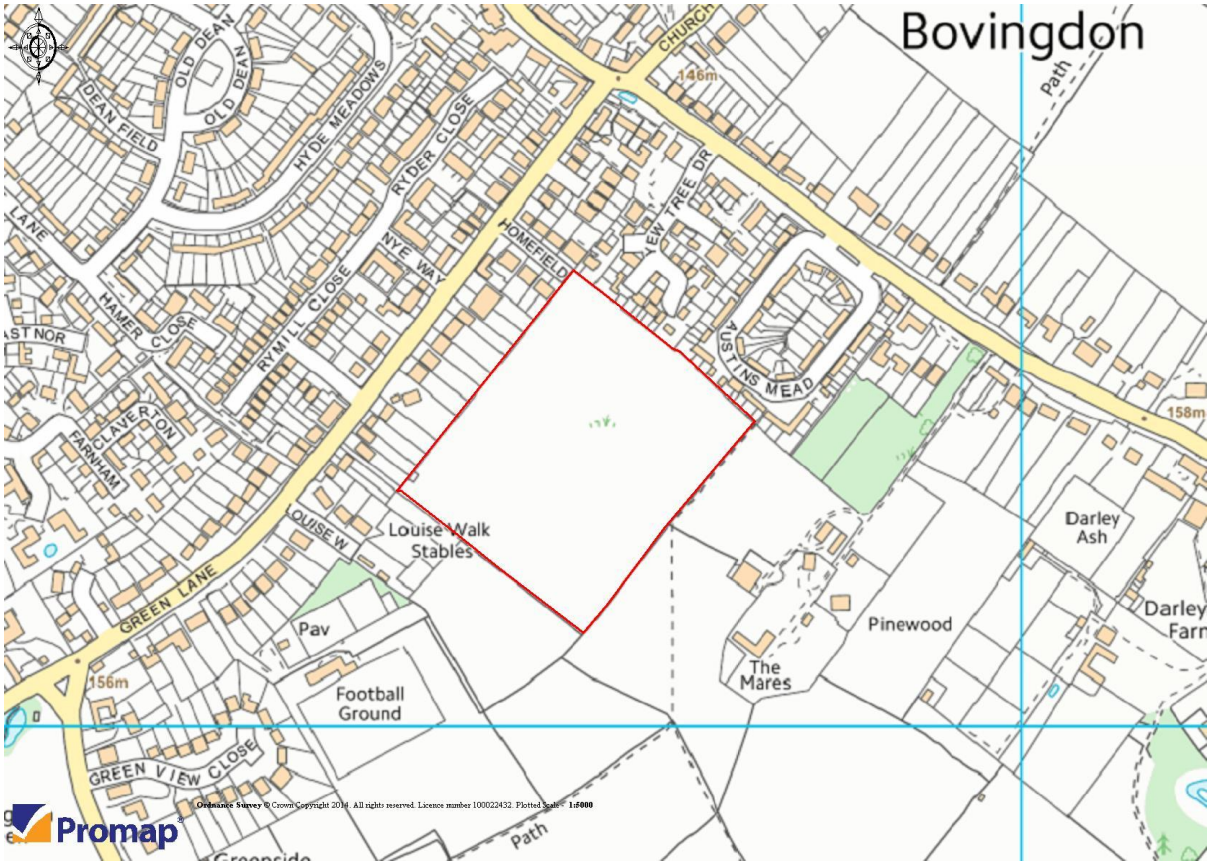
2.4 The Bovingdon Place Strategy notes that the large village has a vibrant centre and a good provision of local shops, providing for most day-to-day needs. There are also good links to Hemel Hempstead and Chesham via the B405.

3. THE SITE

Site Location

3.2 The site is situated to the south east of Bovingdon and comprises of approximately 5.4ha of agricultural land which is demarked by existing hedge rows/ trees. There is also a grouping of existing trees in the centre of the site. A site location plan is provided at Figure 1.

Figure 1: Land to the south east of Homefield, Bovingdon



3.3 The site is situated within the Green Belt and beyond the limits of the village as defined by the existing Proposals Map. The site is not subject to any other key environmental designations including: the AONB, Special Area of Conservation, SSSI, Local Nature Reserve, Ancient Woodland, Historic Park or Garden, Scheduled Ancient Monument or Floodplain.

3.4 The site has no known environmental constraints including: flood risk, drainage, contamination and hazardous waste.

3.5 The site has no known heritage constraints as the site is not situated within or adjacent to the Conservation Area; there are no listed buildings in proximity to

the site, and there are no tree preservation orders at the site. The accompanying Landscape and Visual Appraisal (**Appendix 2**) notes that there is no inter-visibility between the site and the Conservation Area.

3.6 With regard to the Bovingdon Place Strategy the site is situated adjacent to the semi-urban zone and the peripheral zone. The site is situated on the edge of the built up area of Bovingdon and is well related to existing facilities as demonstrated in Table 1 of this report and the facilities plan at Appendix C of the Technical Note found at Appendix 1 of this report.

Table 1: Distance from site entrance at Homefield to existing facilities

Town Centre	within 500m
Local shop – Co-Op	within 500m
Nearest bus stop	within 300m
Bovingdon Primary School	within 500m
Kings Langley Secondary School	approx 6km

Availability

3.7 This site is owned by one landowner who has previously submitted this site for consideration by the council for allocation. My client, Taylor Wimpey has an option agreement in place with the landowner to seek to secure planning permission and develop the land for residential use.

Deliverability

3.8 There are no identified constraints which would impact upon the delivery of this site as such the site is available immediately.

3.9 The site is being promoted by a housebuilder who intends to progress the scheme in the short term.

4. SUITABILITY FOR RESIDENTIAL REDEVELOPMENT

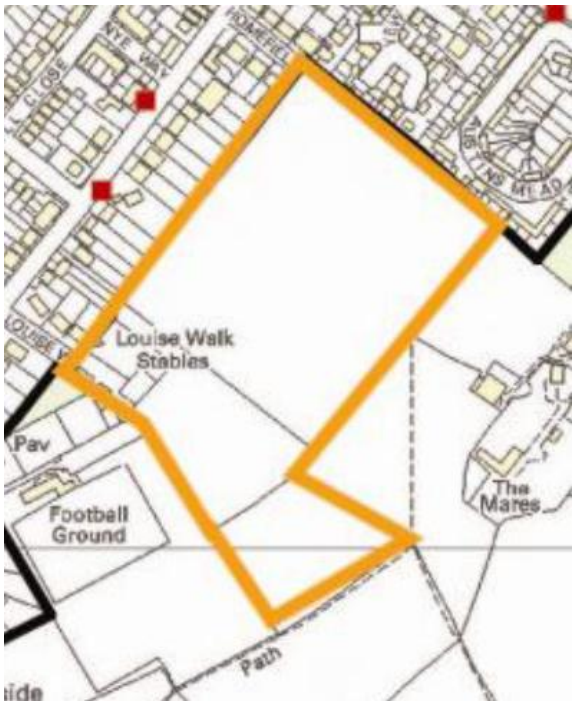
Site Appraisals (November, 2008)

4.2 This site has previously been considered by the Council as part of the Schedule of Site Appraisals in 2008. The site was given the reference Land at Green Lane, Bovingdon 'Site Bov/h9'. Within this assessment concern was raised about impact on green belt, pressure on local services and traffic congestion. The recommendation was to consider further this site as part of the emerging site allocations DPD.

Assessment of Potential Local Allocations and Strategic Sites (June, 2012)

4.3 In 2012 the site was again assessed by the Council but as part of a wider area known as 'Land Rear of Green Lane' the adjacent landowner was promoting the site for residential care home. This assessment found that the wider site was suitable for residential development.

Figure 2: The wider site assessed Land Rear of Green Lane, Bovingdon



4.4 This assessment highlighted the benefits of the site to be its close proximity to the village and the limited impact its development will have on the character of the village.

4.5 Concern was raised about the impact upon the Green Belt and there being no obvious point of access.

Responding to development constraints

Green Belt

4.6 Dacorum Borough Council commissioned a Green Belt Review in conjunction with St Albans City and District Council, and Welwyn Hatfield Borough Council. The findings of this report were published in November 2013. This site has been assessed to be one of only two small scale sub areas in Dacorum which least fulfil the Green Belt purposes.

4.7 Paragraph 8.3.3 of the Green Belt Review refers to the site as 'D-SS2 – Land at southeast edge of Bovingdon (GB13) at Homefield, off Green Lane', it states "*Assessed in isolation this land makes a limited or no contribution towards checking sprawl, preventing merging or maintaining local gaps. The sub-area makes a relatively limited contribution to the primary functions of the Green Belt.*"

4.8 A Landscape and Visual Appraisal and Green Belt Review has been prepared for the Land to the south east of Homefield by CSa Environmental Planning which can be found at **Appendix 1**. The key findings of this report are that:

- The site is of medium to low landscape quality;
- The site is well related to the existing urban area - development would be a planned release of land and would not constitute urban sprawl;
- The site benefits from robust, defensible boundaries and is contained in views such that new housing development would not encroach on the wider countryside;
- Development would not impact upon any known heritage assets; and
- Development would not lead to coalescence.

4.9 The report also reviews the ability of the Green Belt land on the periphery of the village to accommodate residential development and any potential landscape and visual constraints. The report assesses the following options as informed by Dacorum Borough Council's Spatial Strategy for the Village of Bovingdon (June 2009).

- Option 1: Duckhall Farm,
- Option 2: Rear of Green Lane (including land to the south east of Homefield),
- Option 3: Grange Farm, and
- Option 4: North of Chesham Road.

4.10 The report found that Option 2 including land to the south east of Homefield and part of Option 4 (the allocated site east of Molyneaux Avenue) would provide the

most logical release of land from the Green Belt and would provide the least impact in landscape terms. As such it is requested that the Council seriously considers the benefits of allocating the land to the south east of Homefield, Bovingdon.

Highways

4.11 The site is well related to existing facilities within Bovingdon and it is considered reasonable that future residents would walk or cycle to these facilities. It is noted that the secondary school is situated in Kings Langley but students will be able to use the school bus provided.

4.12 Bovingdon bus stops are served by the 352 and 353 bus routes providing links to Watford, Slough, and other local settlements. Both of which are within walking distance of this site.

4.13 The Technical Note Access Appraisal (**Appendix 2**) has found that the site can be accessed safely and efficiently via an extension of Homefield into the site. This access would provide a suitable access to accommodate up to 175 dwellings on site subject to minor carriageway widening by way of removal of the existing grassed verges to provide the necessary carriageway width. An alternative access point for vehicle/ pedestrian/ cycles could also be provided via Yew Tree Drive within land controlled by the landowner.

4.14 Through engagement with Hertfordshire County Council Highways it has been confirmed in principle that Homefield would be the preferred access point for the site in conjunction with proposals to widen the carriageway to achieve a 5.5m width. It has also been confirmed that this can be achieved within the existing highway corridor.

4.15 An initial assessment of the trip generation associated with the delivery of 130 homes at this site has been completed. Results have shown that traffic would be spread across a number of routes within Bovingdon and it is not considered that the scale of traffic would have a significant detrimental impact upon the operation of the local road network. These findings echo Hertfordshire County Council Highway's comments about the potential site allocations within Bovingdon.

4.16 An assessment of the impact the development traffic would have upon the double mini-roundabout within the centre of Bovingdon (B4505) has revealed that the junction could accommodate this development.

4.17 It has been found that there are no existing road safety concerns on the surrounding roads which would be exacerbated by the development proposals.

5. SUMMARY/CONCLUSION

5.1 It has been demonstrated that the land to the south east of Homefield, Bovingdon is suitable and available for residential development. There are no constraints to delivery and as such the site can be delivered within 5 years.

5.2 It is anticipated that this site has the capacity to deliver approximately 130 dwellings, including a high level of affordable units.

5.3 Taylor Wimpey is aware of the Council's recent adoption of CIL and is willing to make the necessary payment to mitigate the impact of residential development upon local infrastructure as required. Taylor Wimpey is also willing to enter into a S106 agreement to secure the delivery of affordable housing and other site specific infrastructure.

5.4 The site has a single owner who has previously promoted this land for residential development. There are no identified constraints to the delivery of this site and Taylor Wimpey is committed to the delivery of residential development. It is therefore strongly recommended that this site is allocated for residential development within the initial 5 year phase of the Site Allocations DPD.

Dacorum Borough Council
2015 Call for Sites – Submission Form

Please refer to the guidance note and FAQ for further details when completing the form.

1. CONTACT DETAILS

Your details	**Your agent's details**
Name:	**Name:** Lydia Voyias
Organisation: Taylor Wimpey	**Organisation:** Pegasus Group
Address:	**Address:** 3 Chivers Way Histon Cambridge CB24 9PT
Telephone:	**Telephone:** 01223 202100
Email:	**Email:** Lydia.Voyias@pegasuspg.co.uk

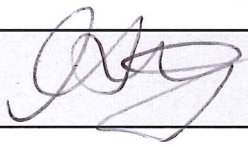
What is your (or your client's) interest in the land? *(please tick all that apply)*

- ☐ Sole owner
- ☐ Part owner
- ☐ No legal interest
- ☒ Developer option
- ☐ Other *(please specify)*.....

If you are not the landowner or the site is in multiple ownership then please submit the name, address and contact details of the landowner(s):

The site is owned by one landowner and Taylor Wimpey has an option agreement in place with the landowner.

I confirm that the landowner(s) has been informed of this submission: ☒ Yes ☐ No

Signature:  **Date:** 30/03/2015

2. SITE DETAILS *(If you are suggesting more than one site, please use a separate form.)*

Site Address: Land to the South East of Homefield, Bovingdon

(Please include a plan showing the location of the site and its boundaries.)

Total Site Size (Ha): 5.4 Ha	**Estimated Deliverable Area of the Site (Ha):** 5.4 Ha

Current Land Use(s): Agricultural Land

Historical Land Use(s): N/A

Adjacent Land Use(s): Residential use to the North West and North East of the site. Further to the South of the site is the Bovingdon and Flaunden Tennis club, and Bovingdon Football Ground

Relevant Planning History (if known): Please refer to accompanying report.

Is the site: ☐ Previously Developed? ☒ Greenfield? ☐ Mixture?

How many buildings are there on the site and what is their nature (e.g. in use/vacant/derelict)? (Please annotate plan to indicate buildings.) ***Details*:**

No buildings are present.

Preferred future use of the site (please tick all that are appropriate and give details below):

☒ Housing
☐ Business (B1)
☐ Industry (B2)
☐ Retail
☐ Storage & Distribution (B8)
☐ Community Facilities
☐ Other (*please specify*).....

Housing

Details (e.g. area, number of units, proposed floorspace, etc.):

130 (including a high level of affordable units).

3. SUITABILITY

Please indicate any known constraints to developing the site:

Environmental Constraints:

☐ Flood Risk ☐ Drainage ☐ Contamination ☐ Hazardous Waste

Details: No known constraints.

Heritage Constraints:

☐ Conservation Area ☐ Listed Building

☐ Archaeology ☐ Tree Preservation Order

☐ Other (*please specify*).....

Details: No known Heritage Contraints. The site is not situated within or adjacent to the conservation area. There are no listed buildings in proximity to the site and there are no preservation orders at the site.

Physical Constraints: ☐ Access ☐ Trees ☐ Slopes/Topography

Details: No physical constraints. Please refer to accompanying report.

What utilities are available to the site e.g. water, gas, electricity, telecoms, etc?: *(please list)*

Given the proximity to existing residential development, it is considered that the above utilities can be made available to the site.

Other Constraints: *(please list any other constraints)*

The site is currently designated Green Belt. Please refer to accompanying report

3. SUITABILITY (cont'd)

Would the constraints make all and/or part of the site unavailable for development in the short term (i.e. 0-5 years); and could interventions be made to overcome the constraints? (please give details)

The site is available for development and the supporting landscape and Visual Appraisal Green Belt review illustrates that the site is well contained, well related to the existing pattern of development and would not encroach significantly on the wider countryside. The site makes little contribution to the other four objectives of the Green Belt as set out by the National Planning Policy Framework. As such, this site provides a logical release of land from the Green Belt at Bovingdon.

4. AVAILABILITY

Over what timeframe would you anticipate the site could become available for development?

- [X] Within 5 years
- [ ] Within 6-10 years
- [ ] Within 11-15 years
- [ ] 16 years or more

Is there any market interest in the site? *(please give details e.g. developer interest or whether the site is being marketed)*

Yes. The site has a single owner who has previously promoted this land for residential development. There are no identified constraints to the delivery of this site and Taylor Wimpey is committed to the delivery of residential development.

Is there a current planning application on the site? *(If so, please give details)*

No.

Are there any legal/ownership constraints on the site that might prohibit or delay any development (e.g. restrictive covenants, ransom strips, etc)? *(please give details)*

No.

5. ACHIEVABILITY (please complete for housing sites only)

How many dwellings can the site expect to achieve? 130

What type of dwellings could the site achieve? *(please tick all that apply and give details below)*

[X] Family houses [ ] Flats [X] Affordable housing [ ] Sheltered housing

[ ] Other (*please specify*).....

Details: A range of housing can be provided at this site in the accordance with policy requirements

In your opinion, what likely affect would neighbouring land uses have on the site's marketability? *(please give details)*

[ ] Positive [X] Neutral [ ] Negative

The site is suitable for residential development and is compatible with existing surrounding uses.

What effect do you envisage any site preparation or remediation costs may have on the sites' deliverability? *(please give details)*

[ ] Positive [X] Neutral [ ] Negative

N/A

Are there any other issues that may influence the achievability or timing of the development of the site? *(please give details)*

No

6. ANY OTHER INFORMATION

Please provide any other relevant information regarding the site, if not already covered above.

Please return this form and accompanying sheets/maps, etc. **by 5.15pm on 30 March 2015** to ensure your site is considered.

Return by email to: strategic.planning@dacorum.gov.uk

Return by post to:

Strategic Planning team,

Planning, Development & Regeneration

Dacorum Borough Council,

Civic Centre,

Marlowes,

Hemel Hempstead HP1 1HH

For any queries, please contact the Strategic Planning team on 01442 228660.

NP/LV/CAM.0970

30th March 2015

Mr Francis Whittaker
Strategic Planning & Regeneration
Dacorum Borough Council
Civic Centre
Marlowes
Hemel Hempstead
HP1 1HH

Dear Francis,

Call for Sites 2015 - Response on behalf of Taylor Wimpey
Land to the south east of Homefield, Bovingdon

Further to your letter dated 20th January 2015, I enclose the completed Call for Sites Proforma and an updated report on behalf of Taylor Wimpey to support the allocation land to the south east of Homefield, Bovingdon for residential development within the emerging Site Allocations DPD.

Pegasus Group has submitted representations to the Pre-Submission Site Allocations Document in November 2014 to raise concern that the emerging Site Allocations DPD does not seek to allocate a sufficient amount of housing for Bovingdon. The Core Strategy identified 130 dwellings to be delivered at Bovingdon however the emerging plan only seeks to allocate 'Chesham Road, Bovingdon' (site reference LA6) for 60 dwellings. It is argued that the land to the south east of Homefield, Bovingdon should be allocated for residential development.

The enclosed proforma and report demonstrate that the site is suitable and available immediately for residential development. It is anticipated that this site has the capacity to deliver approximately 130 dwellings with a high level of affordable units.

My client is aware of the Council's recent adoption of CIL and is willing to make the necessary payment to mitigate the impact of residential development upon local infrastructure as required. My client is also willing to enter into a S106 agreement to secure the delivery of affordable housing and other site specific infrastructure.

The site has a single owner who has previously promoted this land for residential development. There are no identified constraints to the delivery of this site and Taylor Wimpey is committed to the delivery of residential development.

It is requested that this site is allocated for residential development within the initial 5 year phase within the Site Allocations DPD.

3 Pioneer Court, Chivers Way, Histon, Cambridge, CB24 9PT
T 01223 202100 F 01223 237202 www.pegasuspg.co.uk

I would welcome the opportunity to discuss this matter further with you. In the meantime please do not hesitate to contact me should you have any queries regarding this submission.

Yours sincerely,

Lydia Voyias
Principal Planner
Direct Dial: 01223 202103
Email: lydia.@pegasuspg.co.uk

i-Transport LLP
Centurion House
129 Deansgate
Manchester
M3 3WR
Tel: 0161 830 2172
Fax: 0161 830 2173
www.i-transport.co.uk

TECHNICAL NOTE

Project No:	**ITM9325**
Project Title:	**Bovingdon, Hertfordshire**
Title:	**Transport Appraisal**
Ref:	**VACE/JDW/ITM9325-004 TN**
Date:	**8 July 2016**

SECTION 1 INTRODUCTION

1.1 Introduction

1.1.1 Taylor Wimpey is currently promoting a residential site at Bovingdon, Hertfordshire. The site is located to the south-east of the village of Bovingdon, to the east of Green Lane and to the south of Chipperfield Road.

1.1.2 The site is currently within the Green Belt and has been identified as 'Land Rear of Green Lane - Site Bov/h9' within Dacorum Borough Council's Assessment of Potential Local Allocations and Strategic Sites document (Final Assessment, June 2012). The site is c. 5.4ha in size and its location is illustrated on the plan contained at Appendix A.

1.1.3 Taylor Wimpey has indicated that the residential development could comprise c.130 dwellings.

1.1.4 There are two existing residential roads which connect into the site – Homefield, to the north-western corner of the site and via Yew Tree Drive, to the north of the site.

1.1.5 An initial review of the potential access options and the general accessibility of the site undertaken by i-Transport has concluded:

- Homefield would provide a suitable form of access – either as a single point of access or as one of two accesses to the site. Minor widening of Homefield may be required to accommodate the proposed level residential development if this was to be the only point of access, subject to further discussion with Hertfordshire County Council (HCC).

- Yew Tree Drive, which is a narrower route to the site may provide a suitable form of secondary access to the site.

- The site is well located within the village, offering ease of access to a range of key facilities and to existing public transport services which run adjacent to the site.

1.1.6 It is therefore concluded that the site would provide the opportunity for a sustainable residential development to be created, consistent with current national and local transport policy guidance.

1.1.7 The purpose of this Transport Appraisal is to provide an updated accessibility appraisal of the development site; propose an access strategy for the site; and to present the results of an initial highway impact appraisal, considering the impacts of the development generated traffic upon key junctions within Bovingdon.

SECTION 2 ACCESSIBILITY OF THE SITE

2.1 Introduction

2.1.1 The Hertfordshire Local Transport Plan describes accessibility as follows:

> **"Accessibility in terms of local transport planning is defined… as people being able to access key services at reasonable cost, in reasonable time and with reasonable ease. Such a standard of access by appropriate transport to the key services of health, learning, work, food shopping and leisure is important for all residents."**

2.1.2 This section presents an updated summary of the location of key facilities and describes the existing sustainable transport provision within the vicinity of the site, which allow future residents to access key services by a range of travel modes.

2.1.3 Table 2.1 below includes the location of a range of education, employment, health, retail and other facilities within the vicinity of the proposed development site, both locally within Bovingdon and further afield within Hemel Hempstead, Berkhamsted and beyond. This accessibility appraisal is based upon a preferred maximum walking distance of 2km (Institution of Highways and Transportation's – Providing for Journeys on Foot) and DfT guidance on cycling which indicates that many utility cycle journeys are under 3 miles (5km).

Table 2.1 : Location of Key Facilities

Type of Facility	Closest Facilities to Site	Distance to Site*
Public Transport	Bus stops on Green Lane and Chipperfield Road	150m – 250m
	Hemel Hempstead Railway Station	4.5km
	Berkhamsted Railway Station	9.5km
Primary Schools	Bovingdon Primary School	500m
	Chipperfield St Pauls C of E Primary School	3.7km
	Two Waters Primary School	6.3km
Secondary Schools	Ashlyns School, Berkhamsted	8.8km
	Kings Langley School	6.4km
	Chesham Grammar School	5.8km
Health Facilities	Dr J Patel & Partners, Bovingdon	600m
	Archway Surgery	400m
	Michaels & Associates (Dentist)	400m
	Manor Pharmacy	600m
	Hemel Hempstead General Hospital	7.4km
Employment Areas	Bovingdon	400 – 600m
	Hemel Hempstead	7km
	Berkhamsted	9.5km
Retail	High Street, Bovingdon (various)	250-800m
	Post Office, Bovingdon	450m
	Co-op, Bovingdon	500m
	Hemel Hempstead (major retail facilities)	7km
Leisure / Other	Library, Bovingdon	450m
	Football Club & Sports Courts, Bovingdon	850m
	Bovingdon Airfield	2.8km
	Hemel Hempstead	7km

*Distance measures to access onto Homefield and Yew Tree Drive

2.1.4 As shown on Table 2.1, many of the facilities within Bovingdon are within 400 – 800m of the site and therefore well within easy walking and cycling distance of the site. Hemel Hempstead railway station is also c.4.5km from the site, therefore within cycling distance.

2.1.5 Many facilities located further afield are also accessible by bus, via the existing bus routes which serve Green Lane, Chipperfield Road / High Street adjacent to the site and provide connections to Hemel Hempstead and Chesham. Table 2.2 summarises the existing bus frequencies and as identified in Table 2.1 above, the existing bus stops are within easy walking distance of the site.

Table 2.2: Existing Bus Frequencies for Services Passing along Green Lane and Chipperfield Road

Bus Service No.	Route	Frequency (daytime only)		
		Monday - Friday	Saturday	Sunday
51 *	Chipperfield – Bovingdon - Hemel Hempstead	1 round trip service	-	-
352	Watford – Bovingdon - Hemel Hempstead	Every 2 hours (hourly in peaks)	Every 2 hours	-
353	Hemel Hempstead – Bovingdon – Chesham / Slough	-	-	Every 2 hours
730	Hemel Hempstead – Amersham – Gerrards Cross – Uxbridge	Every 1 hour	Every 1 hour	-

* Runs Tuesdays & Thursdays only

2.1.6 It is considered that the proposed development is well located to access the village's existing selection of bus routes.

2.1.7 Additional public transport facilities are available at Hemel Hempstead railway station and Berkhamsted railway station, with Hemel Hempstead railway station accessible via the majority of the above bus services.

2.1.8 The Dacorum Borough Council Core Strategy identifies the potential for new housing within Bovingdon. The Bovingdon Place Strategy reinforces this and identifies Bovingdon village as having a vibrant centre and good provision of local shops.

2.1.9 This accessibility appraisal has shown that the site is well located in terms of its access to shops, schools health facilities, employment areas and other facilities, consistent with the principles of sustainable development set out in the NPPF.

SECTION 3 ACCESS APPRAISAL

3.1 Background

3.1.1 An access appraisal was conducted in 2014 which identified the potential for the site to be accessed via Homefield, to the north-west of the site, with a potential secondary/emergency access provided via Yew Tree Drive to the north.

3.1.2 A copy of i-Transport's Technical Note ITM9325-002 which set out the potential access options is enclosed at Appendix B.

3.1.3 This section considers the potential access options within the context of the current proposed level of development and presents the access arrangements upon an updated topographical survey base.

3.2 Access via Homefield

3.2.1 The earlier access appraisal (enclosed at Appendix B) identified the scope for access to the site to be achieved via an extension of Homefield eastwards, into the site.

3.2.2 The existing width of Homefield is c.5.0 metres – as shown on Drawing ITM9325-GA-003 enclosed at Appendix C of this note. This width exceeds HCC's minimum road width of 4.8m required to serve developments of up to 100 dwellings.

3.2.3 The current proposal is for the site to be developed for c.130 dwellings. HCC's guidance indicates that road widths of 5.5m are required to serve developments of up to 300 dwellings. The current road width therefore lies between the standard required for developments of up to 100 and up to 300 dwellings and therefore it is considered to provide an appropriate level of provision for development of the scale proposed.

3.2.4 However, as shown on Drawing ITM9325-GA-003, there is scope for Homefield to be widened on its northern side if necessary, to achieve 5.5m width. The need for such widening will be discussed with HCC during scoping discussions.

3.2.5 A speed survey has been conducted on Green Lane to determine the visibility requirements for the Homefield access. This survey shows existing speeds of 30.2mph northbound and 30.9mph southbound and these are assumed to represent wet weather speeds, for robustness.

3.2.6 The resultant visibility requirements – based on HCC's guidance and set out in the Manual for Streets – are 2.4m x 44.7m to the north and 2.4m x 43.3m to the south along Green Lane. As shown on Drawing ITM9325-GA-003 in Appendix C, these splays can be achieved at the existing junction, within the adopted highway boundary.

3.2.7 It is therefore concluded that Homefield provides an appropriate form of access to serve the development, subject to potential widening. The capacity of the Homefield/Green Lane junction is considered in the next section.

3.3 Access via Yew Tree Drive

3.3.1 Yew Tree Drive provides and alternative access to the site from the north, from Chipperfield Road. The route serves a number of existing dwellings and varies in width from 4.8 to 6.0 metres along its length, with some evidence of on-street parking reducing the effective width at intervals along the route.

3.3.2 For a development of the scale proposed, a single point of access would be sufficient and therefore it is proposed that vehicular access is taken via Homefield, as outlined above. The route via Yew Tree Drive could be used for pedestrian and cycle access to the site, providing ease of access to bus routes on Chipperfield Road.

3.3.3 However, it is proposed that a second, emergency vehicle access is provided via Yew Tree Drive which would offer a completely separate route into and out of the site in the event of a blockage on Homefield. It is considered that this additional access provision which is over and above the requirements for a development of this scale further reinforces the position that the existing width of Homefield would be sufficient to cater for 130 dwellings on the site.

3.3.4 The overall access strategy for the site will be agreed with HCC as part of scoping discussions.

SECTION 4 LOCAL HIGHWAY NETWORK IMPACT ASSESSMENT

4.1 Introduction

4.1.1 The section considers the impact of the potential residential development on the local highway network.

4.2 Existing Traffic Flows

4.2.1 The existing traffic flows on the local highway network in the vicinity of the site have been derived from traffic surveys undertaken on Wednesday 8th June 2016 at the following locations, which represent the extent of the study area that would be considered in a subsequent Transport Assessment. A plan illustrating the extent of the study area is contained within Appendix A:

- Chesham Road / Newhouse Road / Hempstead Road / High Street
- High Street / Green Lane / Church Street / Chipperfield Road

- Green Lane / Homefield
- Chipperfield Road / Yew Tree Drive

4.2.2 The traffic flows have been converted to passenger car units (PCUs) and the peak hours identified – 0745 to 0845 for the morning peak and 1700 to 1800 for the evening peak. The existing traffic flows, in PCUs, are given on Figure 4.1.

4.2.3 Queue surveys were also carried out at the Chesham Road / Newhouse Road / Hempstead Road / High Street double mini-roundabout junction, and at the High Street / Green Lane junction to assist in validating the base junction models.

4.3 Assessment Year and Traffic Growth

4.3.1 It is envisaged that development on the site would not commence until 2018 and three-year build period has been assumed. An assessment year of 2021 has therefore been adopted for assessing the impact of the potential residential development and surrounding road network. TEMPro has been used to derive growth factors between 2016-2021 for the Bovingdon area. The traffic growth factors adopted for the assessment are:

- AM Peak: 1.073
- PM Peak: 1.072

4.3.2 The 2021 background flows are presented on Figure 4.2.

4.4 Committed Developments

4.4.1 The traffic flows associated with three future developments in the vicinity of the site have been considered, as agreed with Dacorum Borough Council. The three developments are:

- Permitted retail store at the corner of Chesham Road and High Street;
- Permitted retirement flats development at the former Chilterns Jaguar site, at the junction of Hempstead Road and Vicarage Lane; and
- Proposed future residential development at the H.M. Prison The Mount. (This development is not committed as yet).

4.4.2 A review of these three developments has been carried out, with traffic flows for the retail store based on the supporting Transport Statement by Pinnacle Transportation (April 2009) and traffic flows for The Mount residential development based on the same trip generation and distribution assumptions adopted for the potential Taylor Wimpey site, as described below. With regard to the proposed retirement flats, the Transport Statement prepared by Paul Basham Associates (November 2015), demonstrated that the change in land use of the site would result in reduction in net traffic generation and has therefore not been included in the future assessment scenario, for robustness.

4.4.3 The resultant total committed development traffic flows are presented in Figure 4.3, with the 2021 Base traffic flows, which include the committed development flows shown in Figure 4.4.

4.5 Proposed Development Trip Generation and Distribution

4.5.1 The trip generation that could be expected at the site has been derived using trip rates derived from the TRICS database, with sites selected from the 'Houses Privately Owned' category, for multi-modal surveyed sites. The trip rates and the resultant trip generation – based on a development quantum of 130 units - are shown in Table 4.1 below. The full TRICS output is contained within Appendix D.

Table 4.1: Potential Vehicular Trip Generation

Time Period	Movement	Trip Rates (per dwelling)	No. Trips (130 dwellings)
AM Peak	Arrivals	0.165	21
	Departures	0.408	53
PM Peak	Arrivals	0.342	44
	Departures	0.182	24

Source: TRICS Database – Appendix **D**

4.5.2 The above table shows that the development could be expected to generate c.70-75 two-way vehicles during the peak hours.

4.5.3 To more accurately determine the distribution of traffic across the surrounding network, the total development trips in each peak have been broken down by trip purpose - i.e. travel to work, education, shopping and others – based on the expected proportions of trip purposes provided in TEMPro for the future year.

4.5.4 The trips associated with each trip purpose have been assigned to the local highway network based on the likely destinations for each purpose. These have been based on the following information:

- Travel to work – 2011 Census data for journeys to work;
- Education – locations of existing primary and secondary schools in the vicinity of the site;
- Shopping – split evenly between food shopping and non-food shopping, with local destinations and facilities further afield included; and
- Other – split between Bovingdon High Street, Hemel Hempstead and more distant locations within/via London/M25.

4.5.5 A summary of the trip generation, trip purpose, destinations and distributions are included in Appendix E, and the total traffic flows associated with the site presented in Figure 4.5. The 2021 traffic flows with the potential residential development in place are presented in Figure 4.6.

4.6 Impact Assessment

4.6.1 To determine the impacts of the additional residential traffic, junction capacity analysis has been undertaken for these junctions outlined in Section 4.2 above. The detailed capacity assessments are presented in Appendix F. The junctions have been modelled used JUNCTIONS9 software, which assesses the capacity of priority controlled T-junctions, crossroads and roundabouts. The junction capacity analysis has been carried for the observed (2016) traffic flows to enable the models to be validated and the 2021 future year scenario, without and with the full 130 dwellings.

Chesham Road / Newhouse Road / Hempstead Road / High Street

4.6.2 Table 4.2 presents the results of the capacity analysis at the Chesham Road / Newhouse Road / Hempstead Road / High Street double mini-roundabouts to the west of the site, within the centre of the village.

Table 4.2 Chesham Road / Newhouse Road / Hempstead Road / High Street - Junction Capacity Assessment Results

Arm	AM Peak		PM Peak	
	Max RFC	Max Queue	Max RFC	Max Queue
2016 Surveyed Flows				
Newhouse Road	0.06	0	0.04	0
B4505 Hempstead Road	0.83	5	0.60	2
High Street	0.37	1	0.44	1
B4505 Chesham Road	0.59	1	0.47	1
2021 Base Flows				
Newhouse Road	0.07	0	0.04	0
B4505 Hempstead Road	0.90	8	0.67	2
High Street	0.43	1	0.52	1
B4505 Chesham Road	0.69	2	0.55	1
2021 With Development Flows				
Newhouse Road	0.07	0	0.04	0
B4505 Hempstead Road	0.91	9	0.67	2
High Street	0.47	1	0.53	1
B4505 Chesham Road	0.70	2	0.55	1

*RFC – Ratio of Flow to Capacity

4.6.3 The 2016 model results have been compared against the results of the queue surveys undertaken at the double mini-roundabout and this shows that the model correlates well with the on-site observations.

4.6.4 The results demonstrate that the junction will operate within capacity, with some minor queuing expected in the future scenarios on the B4505 Hempstead Road. The impact of the potential residential development would be to increase queueing on the Hempstead Road arm by one vehicle only, which would not have a significant impact on the operation of the junction. The potential impact would certainly not be considered severe, within the NPPF context.

High Street / Green Lane / Church Street / Chipperfield Road

4.6.5 Table 4.3 presents the results of the capacity analysis at the High Street / Green Lane / Church Street / Chipperfield Road junction. This junction has been modelled as a simple priority T-junction, with all traffic using a single give-way line at Green Lane, as opposed to the current Y-shaped junction arrangement with several give way points, to form a robust assessment.

Table 4.3 High Street / Green Lane / Church Street / Chipperfield Road - Junction Capacity Assessment Results

Arm	AM Peak		PM Peak	
	Max RFC	Max Queue	Max RFC	Max Queue
2016 Surveyed Flows				
Green Lane	0.54	1	0.27	0
Chipperfield Road	0.02	0	0.03	0
Church Street	0.09	0	0.07	0
High Street	0.12	0	0.14	0
2021 Base Flows				
Green Lane	0.59	1	0.29	0
Chipperfield Road	0.02	0	0.04	0
Church Street	0.10	0	0.07	0
High Street	0.14	0	0.16	0
2021 With Development Flows				
Green Lane	0.69	2	0.34	1
Chipperfield Road	0.02	0	0.04	0
Church Street	0.01	0	0.07	0
High Street	0.17	0	0.23	0

*RFC – Ratio of Flow to Capacity

4.6.6 The results demonstrate that the junction will continue to operate within capacity, in the future year, both without and with the forecast development flows. The impacts of the development traffic are shown to be negligible.

Green Lane / Homefield

4.6.7 Table 4.4 presents the results of the capacity analysis at the Green Lane / Homefield junction which would provide the main point of access to the site. This junction has only been assessed with the proposed development in place, as the observed flows show very little turning movements in/out of Homefield, as the road currently serves a small number of dwellings.

Table 4.4 Green Lane / Homefield – Junction Capacity Assessment Results

Arm	AM Peak		PM Peak	
	Max RFC	Max Queue	Max RFC	Max Queue
2021 With Development Flows				
Homefield	0.14	0	0.06	0
Green Lane	0.01	0	0.01	0

*RFC – Ratio of Flow to Capacity

4.6.8 The results demonstrate that the junction will operate well within its capacity once the development has been added. As outlined above in Section 3 the current Homefield alignment is considered to provide an appropriate form of access to the development site.

Chipperfield Road / Yew Tree Drive

4.6.9 No capacity assessments have been carried out for this junction as it is intended that this junction will only provide an emergency vehicle access to the development, and as such will therefore not add any significant traffic flows to the junction.

SECTION 5 SUMMARY

5.1.1 Taylor Wimpey is currently considering the development potential of a site at Bovingdon, Hertfordshire. The site is located to the south-east of the village of Bovingdon, to the east of Green Lane and to the south of Chipperfield Road.

5.1.2 Taylor Wimpey has indicated that the site could deliver c.130 dwellings.

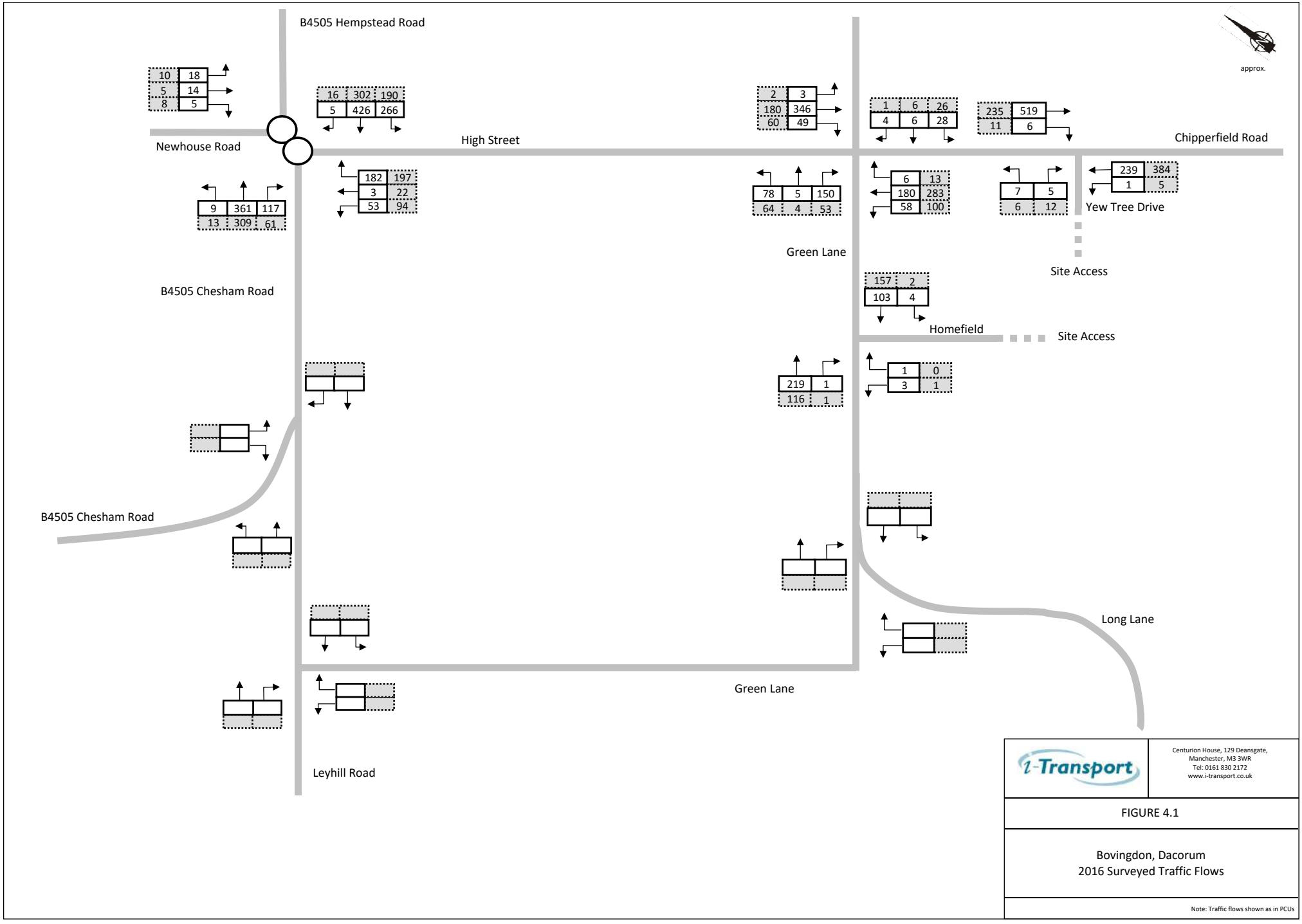
5.1.3 This Technical Note demonstrates that the site is well located within the village, offering ease of access to a range of key facilities and to existing public transport services which run adjacent to the site. Many of the local facilities within Bovingdon are within walking and cycling distance of the site, whilst additional facilities located further afield are also accessible by bus, via the existing bus routes which serve Green Lane, Chipperfield Road / High Street adjacent to the site. The development would therefore accord with current local and national policies regarding sustainable development.

5.1.4 The proposed access strategy for the site is to deliver an access via an extension of Homefield, an existing residential road to the north-west of the site, into the site. The existing width of Homefield is considered adequate to serve the level of development proposed and there is scope for widening if required. An additional emergency vehicle access would also be provided via Yew Tree Drive to the north of the site.

5.1.5 Detailed capacity assessments have been carried out for key junctions around the site and demonstrate that the junctions are expected to operate within capacity even with the addition of the potential residential development traffic.

5.1.6 Overall, it is concluded that the land at Green Lane, Bovingdon would provide a suitable site for residential uses, accommodating c.130 dwellings.

FIGURES

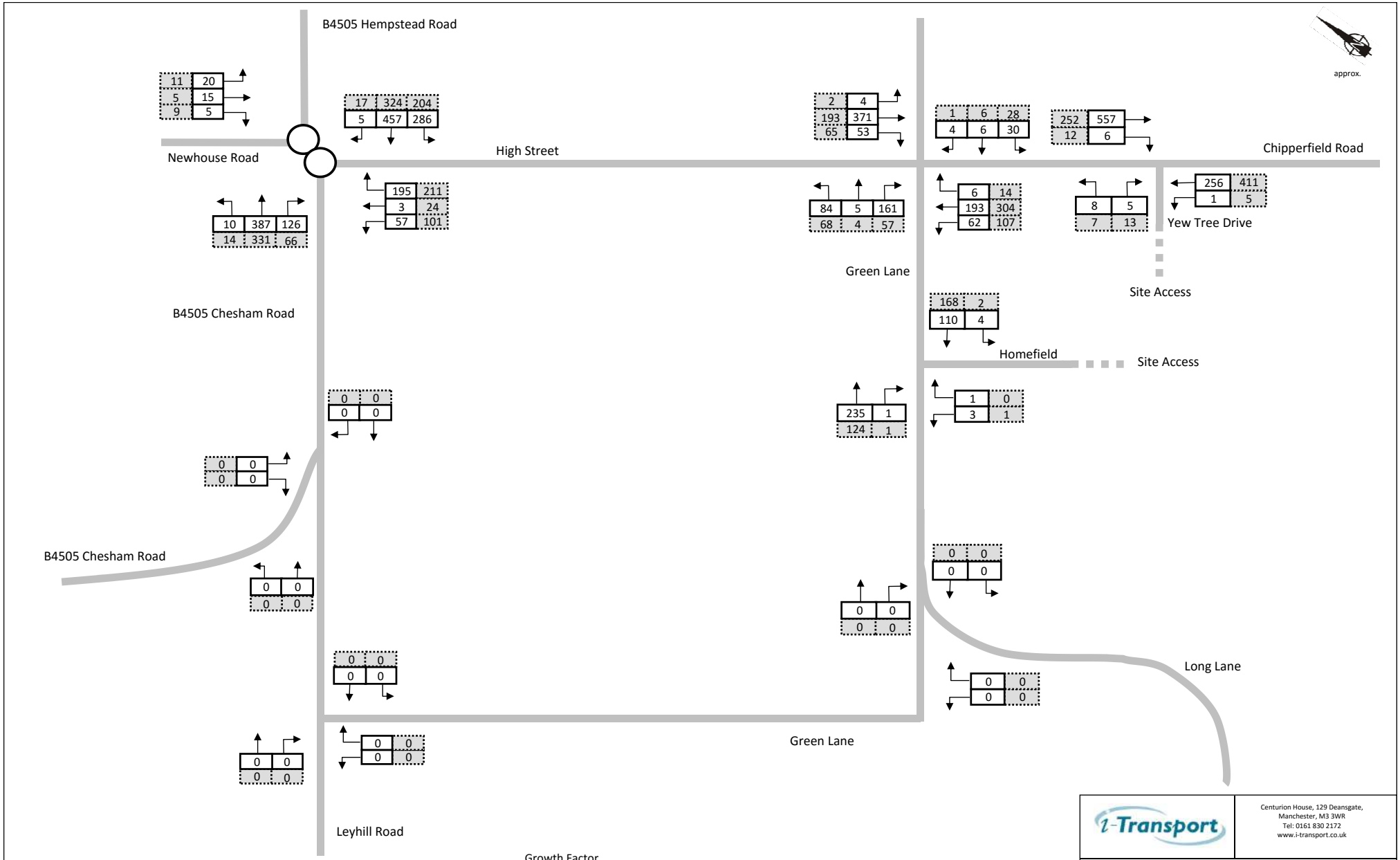


Centurion House, 129 Deansgate,
Manchester, M3 3WR
Tel: 0161 830 2172
www.i-transport.co.uk

FIGURE 4.1

Bovingdon, Dacorum
2016 Surveyed Traffic Flows

Note: Traffic flows shown as in PCUs



Growth Factor
AM Peak : 1.073
PM Peak : 1.072

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FIGURE 4.2

Bovingdon, Dacorum
2021 Base Traffic Flows

Note: Traffic flows shown as in PCUs

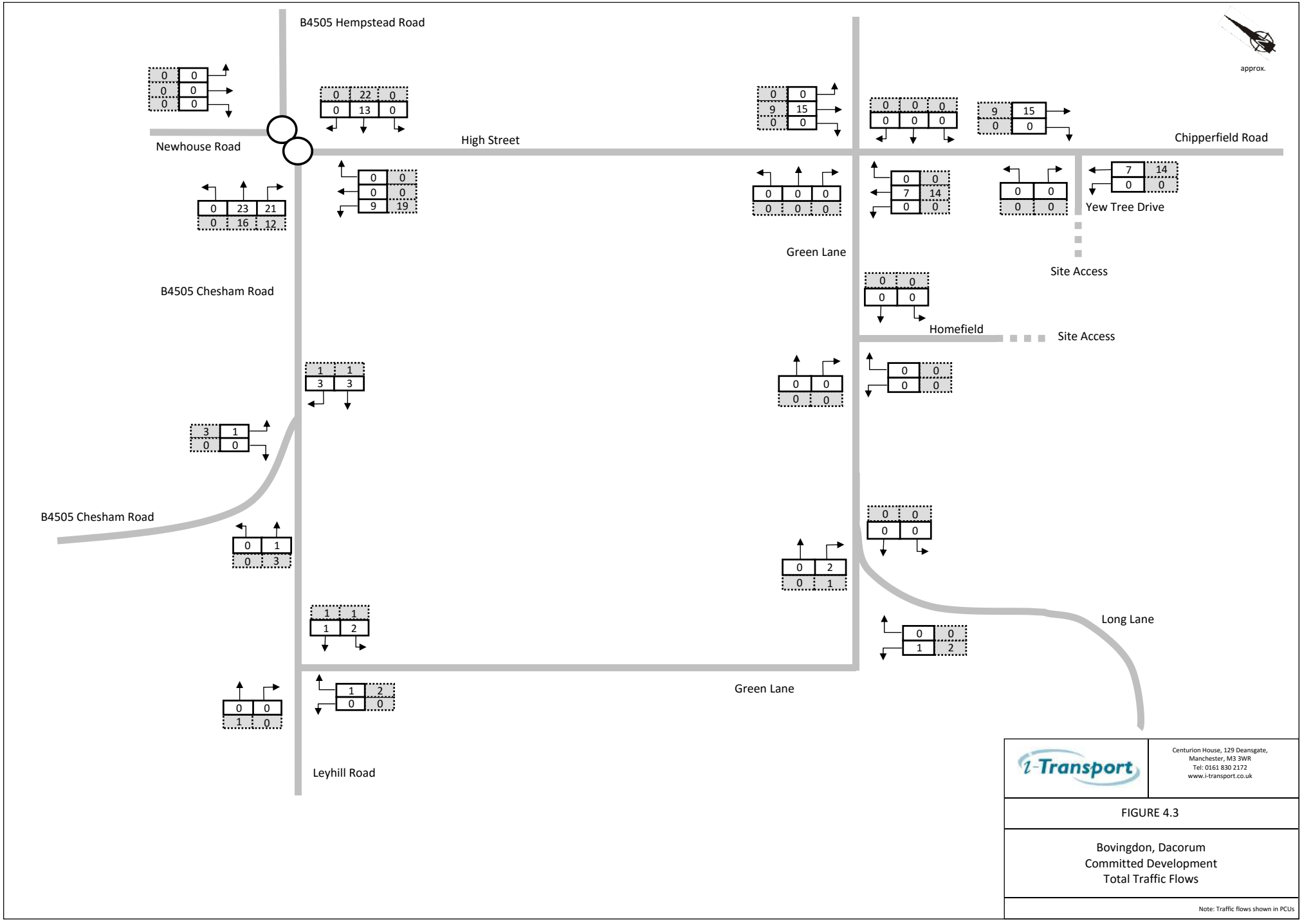

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FIGURE 4.3

Bovingdon, Dacorum
Committed Development
Total Traffic Flows

Note: Traffic flows shown in PCUs

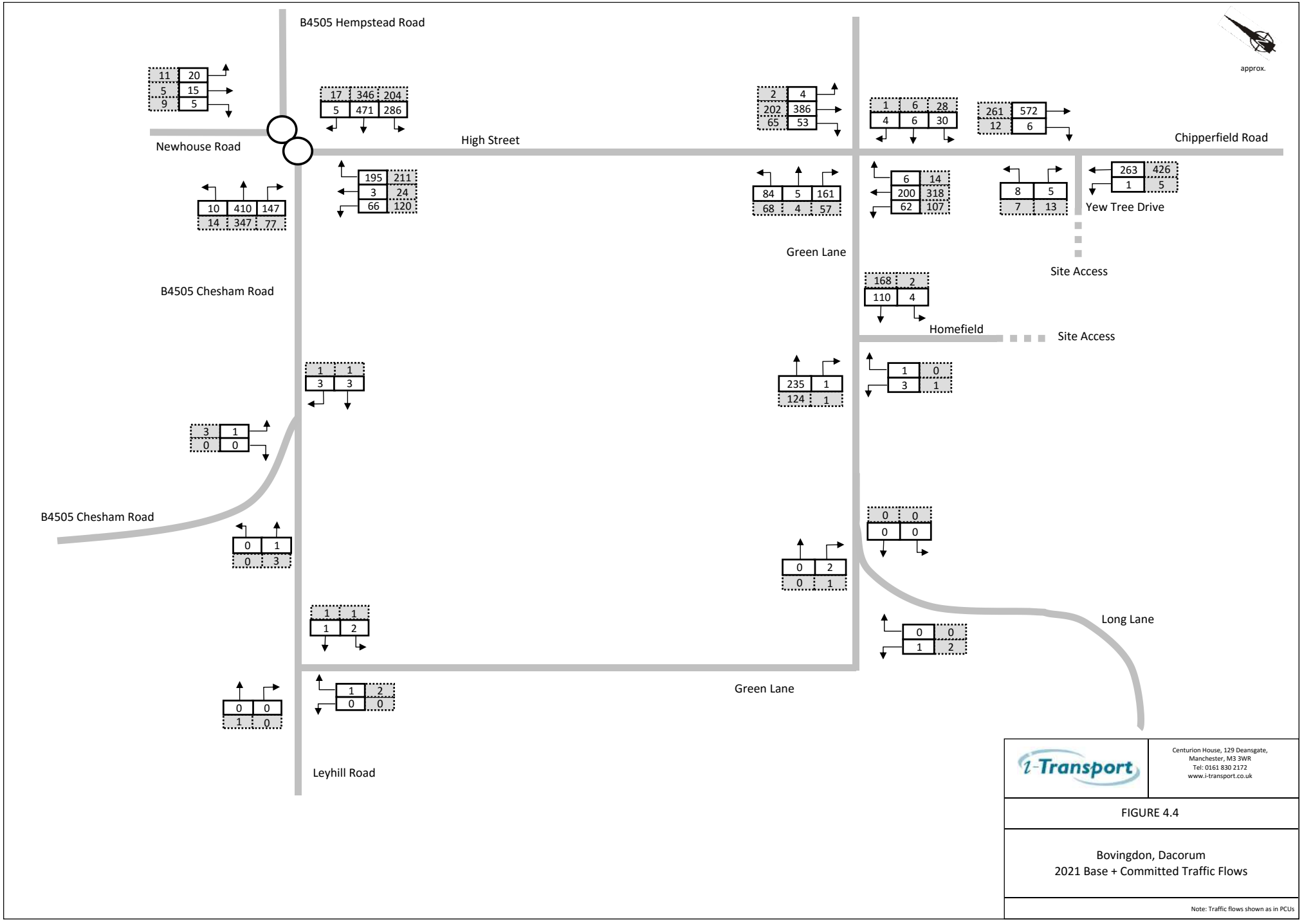

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FIGURE 4.4

Bovingdon, Dacorum
2021 Base + Committed Traffic Flows

Note: Traffic flows shown as in PCUs

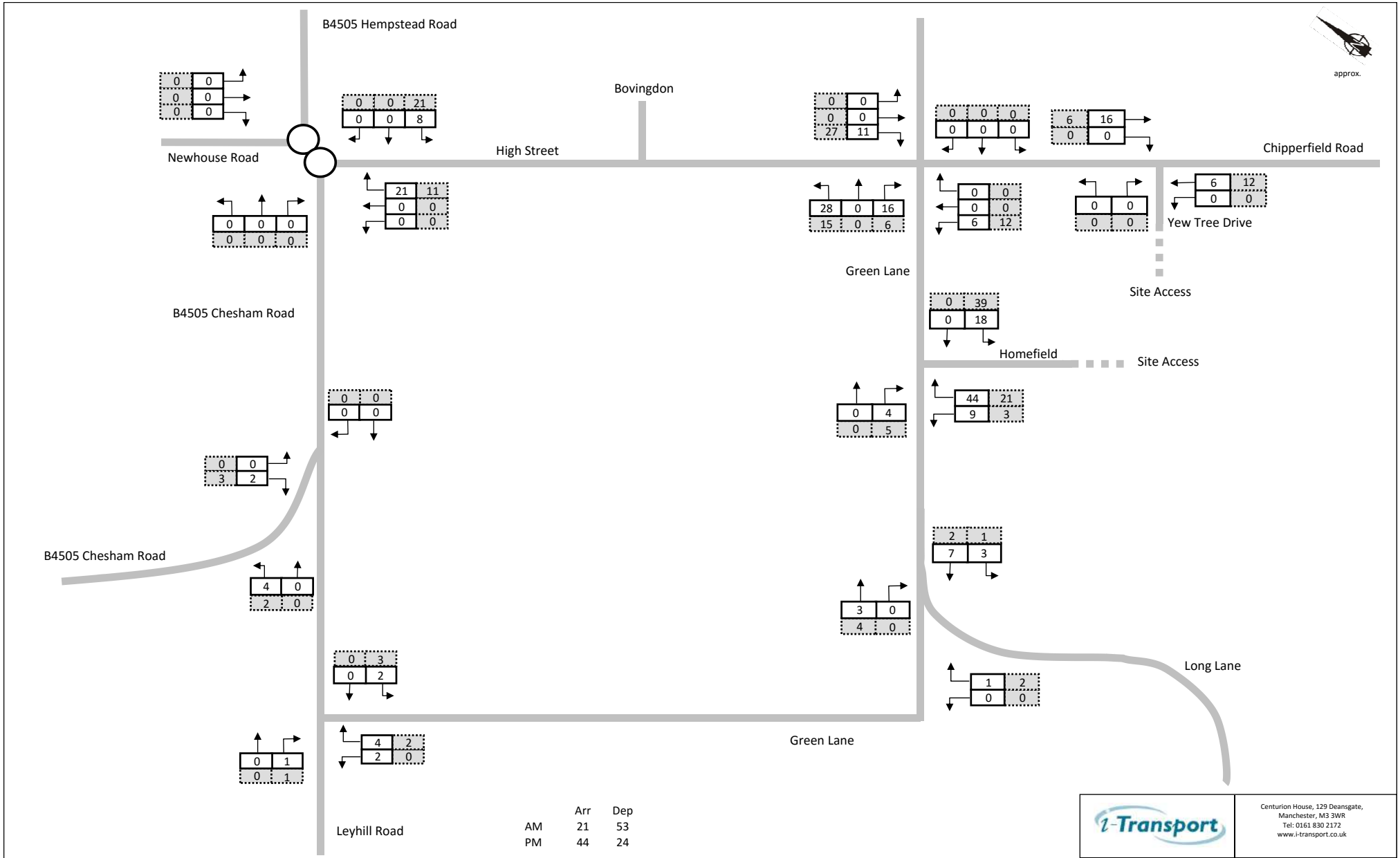

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FIGURE 4.5

Bovingdon, Dacorum
Proposed Development Traffic Flows
(Total Trips)

Note: Traffic flows shown as in PCUs

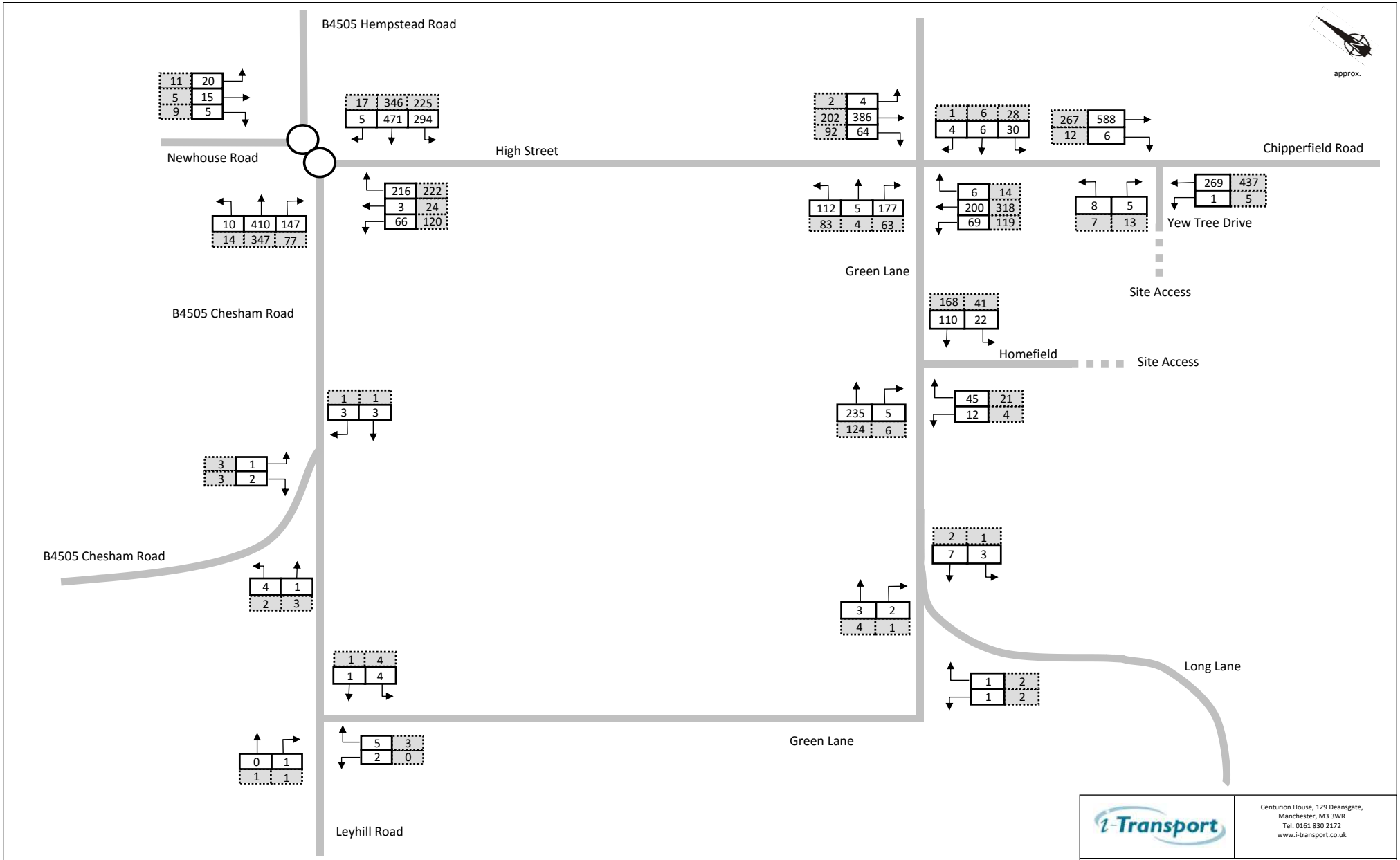

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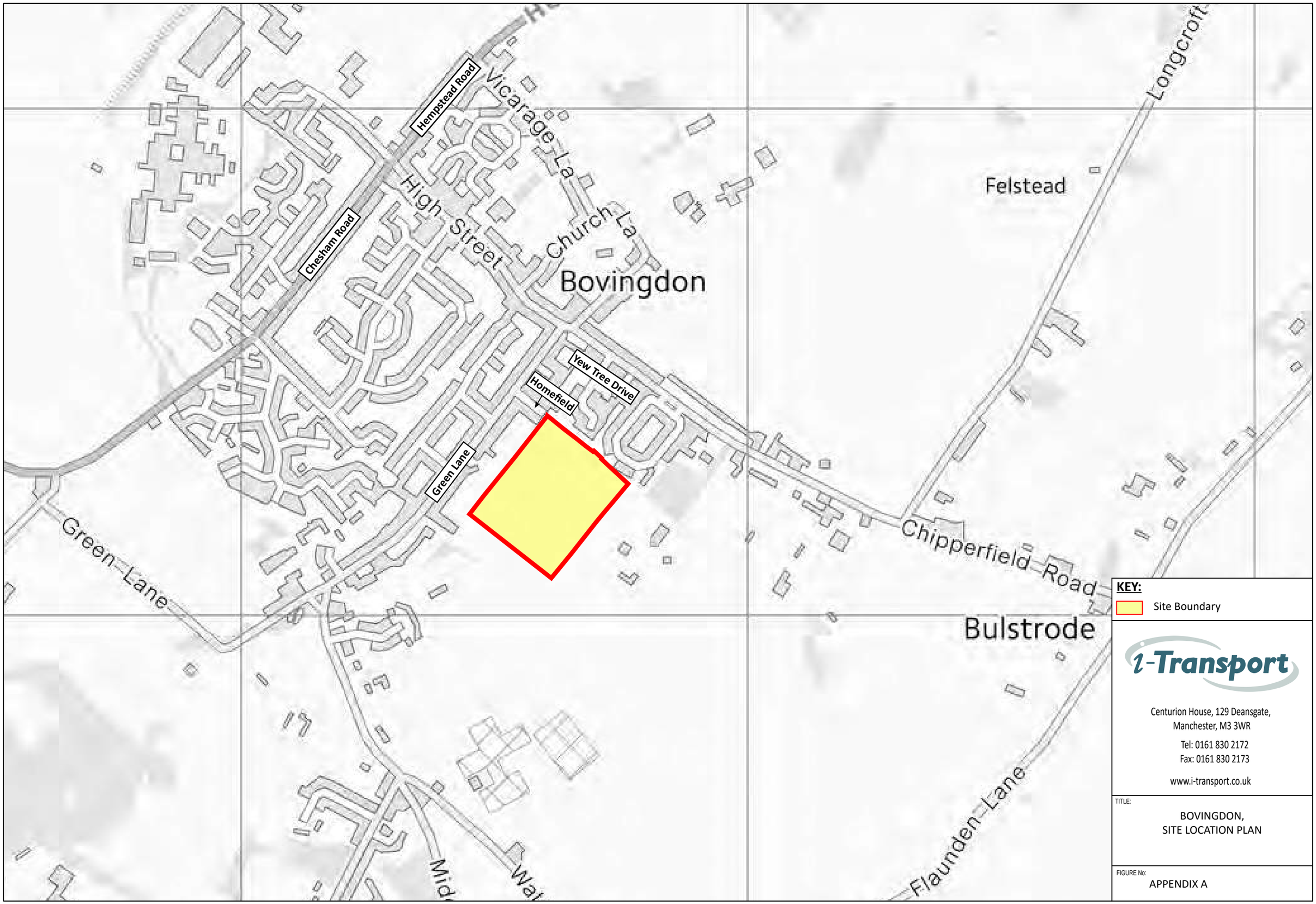
FIGURE 4.6

Bovingdon, Dacorum
2021 Base + Committed + Development Traffic Flows

Note: Traffic flows shown as in PCUs

APPENDIX A Site Location Plan



KEY:

Site Boundary

i-Transport

Centurion House, 129 Deansgate,
Manchester, M3 3WR

Tel: 0161 830 2172
Fax: 0161 830 2173

www.i-transport.co.uk

TITLE:

BOVINGDON,
SITE LOCATION PLAN

FIGURE No:

APPENDIX A

APPENDIX B Access Appraisal

i-Transport LLP
Centurion House
129 Deansgate
Manchester
M3 3WR
Tel: 0161 830 2172
Fax: 0161 830 2173
www.i-transport.co.uk

TECHNICAL NOTE

Project No:	**ITM9325**
Project Title:	**Bovingdon, Hertfordshire**
Title:	**Access Appraisal**
Ref:	**VACE/njg/ITM9325-002 TN**
Date:	**12 March 2014**

SECTION 1 INTRODUCTION

1.1 Introduction

1.1.1 Taylor Wimpey is currently promoting the potential for the development of land at Green Lane, Bovingdon, Hertfordshire for residential uses. The site is located to the south-east of the village of Bovingdon, to the east of Green Lane and to the south of Chipperfield Road.

1.1.2 The site is currently identified as 'Land Rear of Green Lane - Site Bov/h9' within Dacorum Borough Council's Assessment of Potential Local Allocations and Strategic Sites document (Final Assessment, June 2012). The site is c. 5.4ha in size and its location is illustrated on the plan contained at Appendix A.

1.1.3 Taylor Wimpey has indicated that the site has capacity to accommodate up to 175 dwellings.

1.1.4 The site does not have direct frontage access onto the existing highway network. However, two existing residential roads currently terminate at the edge of the site – Homefield, to the north-western corner of the site and via Yew Tree Drive, to the north of the site.

1.1.5 This report considers the potential site access arrangements within the context of Hertfordshire County Council's (HCC's) Roads in Hertfordshire: Highway Design Guide and other relevant guidance, and demonstrates that access to the site could be achieved from one or both of these access points.

1.1.6 This access appraisal also demonstrates that the site is well located within the village, offering ease of access to a range of key facilities and to existing public transport services which run adjacent to the site.

1.1.7 It is therefore concluded that the site would provide the opportunity for a sustainable residential development to be created, consistent with current national and local transport policy guidance.

SECTION 2 ACCESS VIA HOMEFIELD

2.1 Homefield

2.1.1 As noted in Section 1, Homefield is an existing residential road which terminates at the north-western corner of the site. Homefield is currently a cul-de-sac of c.75m length, with footways on either side.

2.1.2 Access to the site could be achieved via the extension of Homefield into the site. Homefield forms part of the existing public highway and as such, it is considered that this would provide a suitable route into the site.

2.1.3 The existing carriageway width along Homefield is 5.0m, with footway / verges of 3.1m – 3.2m on either side. Photo 1 illustrates the existing road provision.

Photo 1

2.1.4 If the site was accessed solely from Homefield, the existing width of the road is such that this would restrict the level of the development on the site to no more than 100 dwellings, based on HCC's guidance.

2.1.5 However, if Homefield was widened by 0.5m, using the adjacent grassed verges, this would provide a carriageway width of 5.5m, which is consistent with the standard of a Major Access Road as defined in the HCC guidance and therefore capable of serving up to 300 dwellings.

2.1.6 There are footways along both sides of Homefield and these are of similar width to the existing surrounding footway network. However, there is scope within the existing highway corridor for the footways to be widened, using the existing grassed verges, if necessary.

2.2 Junction of Homefield with Green Lane

2.2.1 At its western end, Homefield meets Green Lane at a priority-controlled T-junction.

2.2.2 It is assumed that Homefield would be classified as a Major Access Road (subject to widening to 5.5m width) and Green Lane as an Urban Distributor Road, based on the guidance set out in HCC's Design Guide.

2.2.3 Drawing ITM9325-GA-002 enclosed at Appendix B illustrates the existing junction layout and demonstrates that visibility splays of 2.4m x 43m (and beyond) would be achievable at the junction, within the existing highway boundary.

2.2.4 Guidance set out within the Manual for Streets notes that splays measured at an x-distance of 2.4m are appropriate in most built-up situations and the y-distance of 43m is consistent with the requirements for a 30mph road. Photos 2 and 3 below show the existing visibility achievable to the left (south) and right (north) of the junction respectively.

Photo 2

Photo 3

2.2.5 There is currently no footway along the eastern side of Green Lane, to the south of its junction with Homefield, as shown in Photo 4 below.

Photo 4

2.2.6 However, the majority of the facilities within Bovingdon would be accessed via the northern section of Green Lane and therefore it is not considered that a footway link is necessary along the south-eastern section of Green Lane. Consideration would be given to the provision of appropriate dropped kerb provision at the end of Homefield, to ensure that pedestrians using the footways along either side of the route can safely cross the road to access the footways on Green Lane.

2.2.7 The scale of development proposed on the site is such that it is considered that a simple priority-controlled T-junction would be sufficient to accommodate traffic turning into and out of Homefield, to access the existing and proposed residential units.

2.2.8 The capacity of the Homefield / Green Lane junction will be considered in detail as part of a Transport Assessment to support a future application for development on the site.

2.2.9 Overall, it is considered that Homefield would provide a suitable access route for up to 175 dwellings on the site, subject to carriageway widening.

SECTION 3 ACCESS VIA YEW TREE DRIVE

3.1 Yew Tree Drive

3.1.1 Yew Tree Drive lies to the north of the proposed site and is an existing residential road serving in the region of 30 dwellings via a single route which branches into three short culs-de-sac at its southern end. Anvil Close - a short residential cul-de-sac - lies to the east of Yew Tree Drive and provides access to c.5 properties.

3.1.2 At the southern end of Yew Tree Drive, the central of the three culs-de-sac branches could be extended into the site to serve the proposed development. There is an existing gated entrance to the field in this location as shown in Photo 5 below.

Photo 5

3.1.3 The existing width of Yew Tree Drive varies from c.4.8m to 6.0m along the section between Chipperfield Road. Based upon HCC's guidance, accesses with a minimum width of 4.8m are considered suitable to serve up to 100 dwellings.

3.1.4 There is no scope for widening of Yew Tree Drive and therefore it is considered that Yew Tree Drive would only be able to serve up to 100 dwellings, if this was the sole point of access.

3.1.5 However, if an access via Yew Tree Drive was combined with access via Homefield as describe in Section 2 above, it is considered that this could provide a secondary / emergency access route, offering an alternative means of access to the full 175 dwellings on the site.

3.1.6 On-site observations show on-street car parking along Yew Tree Drive, which potentially constrain the width of the route, as shown in Photos 6 and 7 below.

Photo 6

Photo 7

3.1.7 Through careful design of the on-site layout, the focus of vehicular traffic could be directed towards Homefield as the primary route into the site, reflecting the character of Yew Tree Drive as a minor access road.

3.2 **Junction of Yew Tree Drive with Chipperfield Road**

3.2.1 Yew Tree Drive meets Chipperfield Road at its northern end at a priority-controlled T-junction. There is no right turn lane on Chipperfield Road and, based upon the potential use of Yew Tree Drive as a secondary access to the development and based upon the scale of development proposed, it is considered that the existing junction would provide sufficient capacity to accommodate the increased traffic movements associated with the development. This would be confirmed as part of a detailed Transport Assessment.

3.2.2 The actual visibility achievable at the junction is show in Photos 8 and 9 below, to the left (west) and right (east) respectively.

Photo 8

Photo 9

3.2.3 Visibility splays of 2.4m x 43m (and beyond) are achievable at the existing junction of Yew Tree Drive with Chipperfield Road, albeit these splays cross the existing verges which lie either side of Yew Tree Drive which are dedicated as being highway land / registered common land.

3.2.4 Overall, it is considered that Yew Tree Drive would provide a suitable form of secondary / emergency access to the site.

SECTION 4 ACCESSIBILITY OF THE SITE

4.1 Introduction

4.1.1 The Hertfordshire Local Transport Plan describes accessibility as follows:

> **"Accessibility in terms of local transport planning is defined… as people being able to access key services at reasonable cost, in reasonable time and with reasonable ease. Such a standard of access by appropriate transport to the key services of health, learning, work, food shopping and leisure is important for all residents."**

4.1.2 This section presents a summary of the location of key facilities both within Bovingdon village and those further afield and describes the existing sustainable transport facilities within the vicinity of the site, which will allow future residents to access these facilities by a range of travel modes.

4.1.3 Figures 1 and 2 contained within Appendix C illustrate the location of a range of education, employment, health, retail and other facilities within the vicinity of the proposed development site, both locally within Bovingdon and further afield within Hemel Hempstead, Berkhamsted and beyond. These demonstrate that the site is well located in terms of its accessibility to key services.

4.1.4 2km is commonly considered to be an acceptable walking distance – equivalent to a c.25minutes walk – and 5km is considered to be an appropriate distance within which cycling could substitute for car trips. As shown on Figure 1, many of the facilities within Bovingdon are within 400 – 800m of the site and therefore well within easy walking and cycling distance of the site. Hemel Hempstead railway station is also c.4.5km from the site, therefore within cycling distance.

4.1.5 The following Table 4.1 summarises the key facilities that are within the vicinity of the site.

Table 4.1 : Location of Key Facilities

Type of Facility	Closest Facilities to Site	Distance to Site
Public Transport	Bus stops on Green Lane and Chipperfield Road	150m – 250m
	Hemel Hempstead Railway Station	4.5km
	Berkhamsted Railway Station	9.5km
Primary Schools	Bovingdon Primary School	500m
	Chipperfield St Pauls C of E Primary School	3.7km
	Two Waters Primary School	6.3km
Secondary Schools	Ashlyns School, Berkhamsted	8.8km
	Kings Langley School	6.4km
	Chesham Grammar School	5.8km
Health Facilities	Dr J Patel & Partners, Bovingdon	600m
	Archway Surgery	400m
	Michaels & Associates (Dentist)	400m
	Manor Pharmacy	600m
	Hemel Hempstead General Hospital	7.4km
Employment Areas	Bovingdon	400 – 600m
	Hemel Hempstead	7km
	Berkhamsted	9.5km
Retail	High Street, Bovingdon (various)	400m
	Post Office, Bovingdon	450m
	Co-op, Bovingdon	500m
	Hemel Hempstead (major retail facilities)	7km
Leisure / Other	Library, Bovingdon	450m
	Football Club & Sports Courts, Bovingdon	850m
	Bovingdon Airfield	2.8km
	Hemel Hempstead	7km

4.1.6 As shown above, there are a number of local facilities within Bovingdon which are within walking and cycling distance of the site. Many facilities located further afield are also accessible by bus, via the existing bus routes which serve Green Lane, Chipperfield Road / High Street adjacent to the site and provide connections to Hemel Hempstead and Chesham.

4.1.7 It is considered that the site is adequately served by existing bus services. The following table summarises the existing bus frequencies.

Table 4.2: Existing Bus Frequencies

Bus Service No.	Route	Frequency (daytime only)		
		Monday - Friday	Saturday	Sunday
51 *	Chipperfield – Bovingdon - Hemel Hempstead	1 round trip service	-	-
352	Watford – Bovingdon - Hemel Hempstead	Every 2 hours (hourly in peaks)	Every 2 hours	-
353	Hemel Hempstead – Bovingdon – Chesham / Slough	Every 1 hour	Every 1 hour	Every 2 hours

* Runs Tuesdays & Thursdays only

4.1.8 Additional public transport facilities are available at Hemel Hempstead railway station and Berkhamsted railway station.

SECTION 5 SUMMARY

5.1.1 Taylor Wimpey is currently promoting a site at Bovingdon, Hertfordshire for residential uses. The site is located to the south-east of the village of Bovingdon, to the east of Green Lane and to the south of Chipperfield Road.

5.1.2 Taylor Wimpey has indicated that the site has capacity to accommodate up to 175 dwellings.

5.1.3 The site does not have direct frontage access onto the existing highway network. However, two existing residential roads currently terminate at the edge of the site – Homefield, to the north-western corner of the site and via Yew Tree Drive, to the north of the site.

5.1.4 This access appraisal has demonstrated that the site could be served either solely from Homefield or via both Homefield and Yew Tree Drive. Homefield Drive would need to be widened by some 0.5m to provide the primary route to the site. This widening could be achieved within the existing highway boundary utilising the existing grassed verges which run alongside the road. Yew Tree Drive would form a secondary or emergency access link to the site. Either the single access strategy or the two-access strategy would provide a suitable form of access for 175 dwellings (or more) on the site.

5.1.5 This access appraisal also demonstrates that the site is well located within the village, offering ease of access to a range of key facilities and to existing public transport services which run adjacent to the site.

5.1.6 Many of the local facilities within Bovingdon are within walking and cycling distance of the site, whilst additional facilities located further afield are also accessible by bus, via the existing bus routes which serve Green Lane, Chipperfield Road / High Street adjacent to the site.

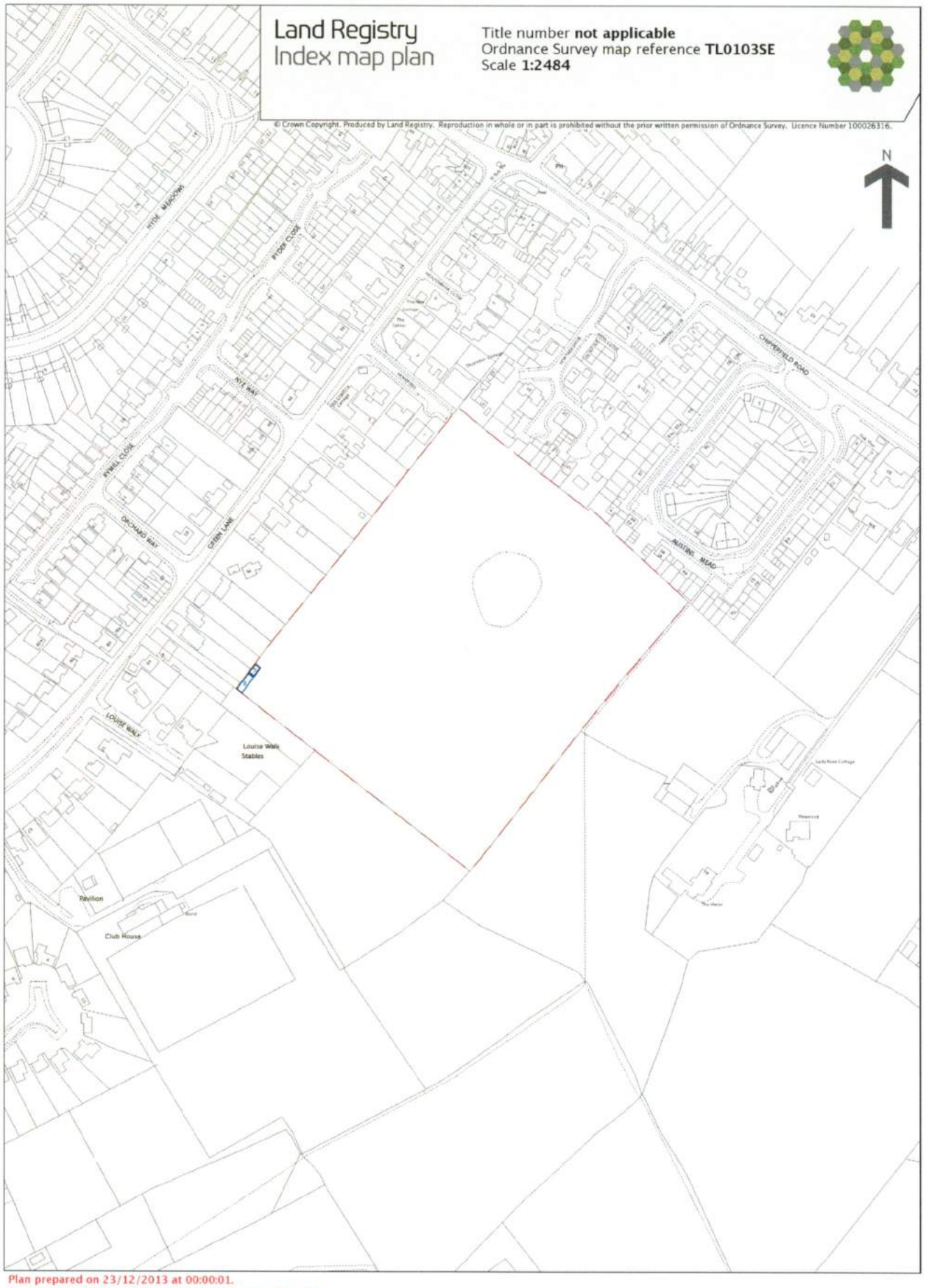
5.1.7 Further details of the capacity of the proposed access arrangements and the potential traffic impacts of the development proposals would be addressed through a Transport Assessment which would be prepared to support a future planning application for the site.

5.1.8 Overall, it is concluded that the land at Green Lane, Bovingdon would provide a suitable site for residential uses, accommodating up to 175 dwellings.

APPENDIX A **Site Location Plan**

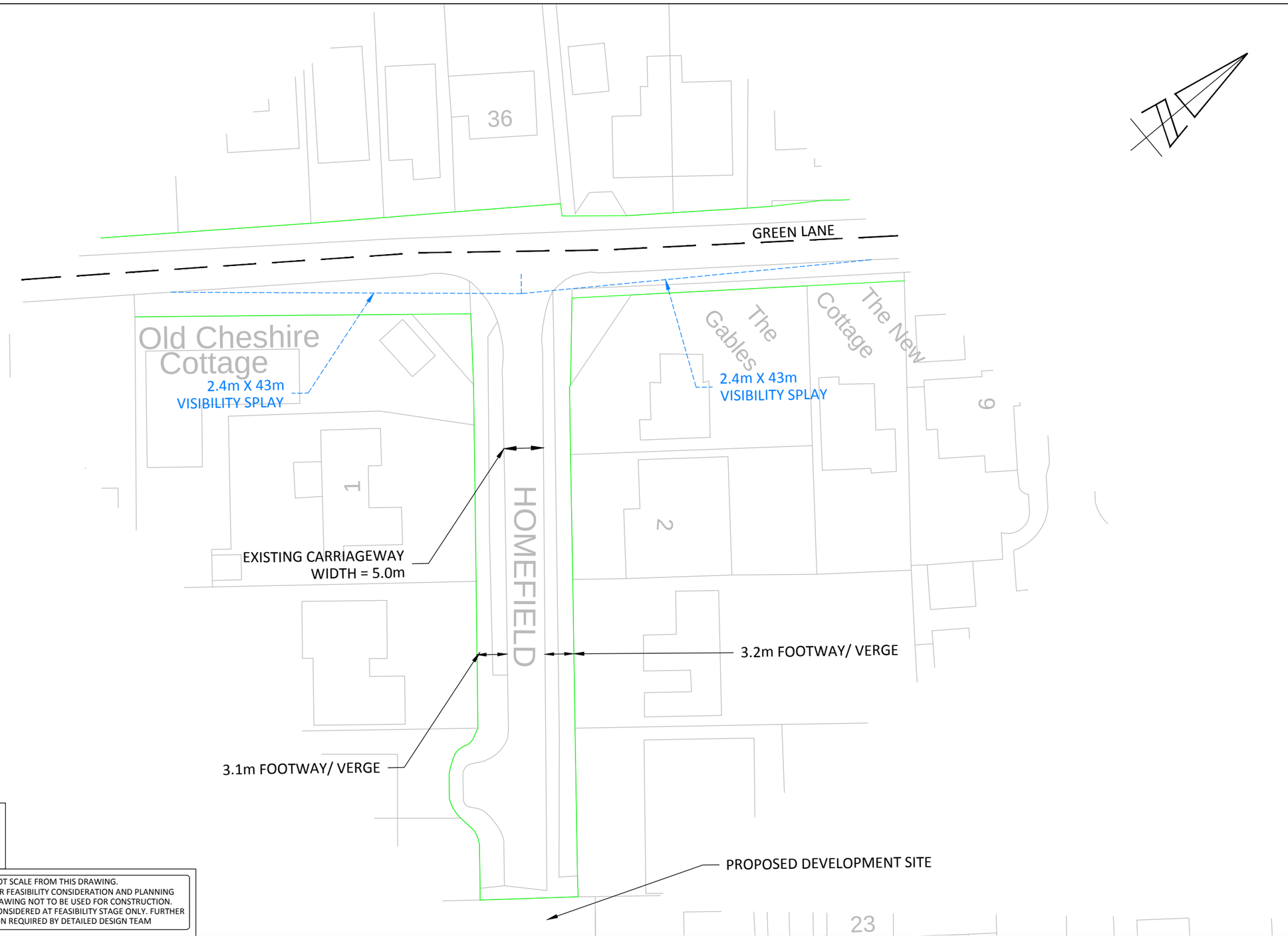
Land Registry
Index map plan

Title number **not applicable**
Ordnance Survey map reference **TL0103SE**
Scale **1:2484**



Plan prepared on 23/12/2013 at 00:00:01.
This Plan should be read in conjuction with result T10YDLB.
This plan shows the general position, not the exact line, of the boundaries. It may be subject to distortions in scale. Measurements scaled from this plan may not match measurements between the same points on the ground. See Land Registry Public Guide 19 - Title Plans and Boundaries.

APPENDIX B **Drawing ITM9325-GA-001 – Homefield Existing Geometry**



KEY

EXTENT OF ADOPTED HIGHWAY BOUNDARY

DO NOT SCALE FROM THIS DRAWING.
DRAWING ISSUED FOR FEASIBILITY CONSIDERATION AND PLANNING PURPOSES ONLY. DRAWING NOT TO BE USED FOR CONSTRUCTION.
CDM REQUIREMENTS CONSIDERED AT FEASIBILITY STAGE ONLY. FURTHER CONSIDERATION REQUIRED BY DETAILED DESIGN TEAM

i-Transport

Centurion House, 129 Deansgate
Manchester, M3 3WR

Tel: 0161 830 2172
Fax: 0161 830 2173

www.i-transport.co.uk

REV	DATE	BY	DESCRIPTION	CHK	APD

STATUS: DRAFT

TITLE: HOMEFIELD EXISTING ROAD GEOMETRY AND VISIBILITY SPLAYS

DRAWING No: ITM9325 - GA - 002

PROJECT No: ITM9325

REV:

PROJECT: BOVINGDON, DACORUM

CLIENT: TAYLOR WIMPEY

SCALE @ A3:	CHECKED:	APPROVED:
1:500	VACE	VACE
FILE REF:	**DRAWN:**	**DATE:**
GA - 002	JF	MARCH 14

ITM9325-GA-002

APPENDIX C **Key Facilities Plans (Local and Wider Context)**

KEY

PRIMARY SCHOOLS
- I Bovingdon Primary School

HEALTH
GP's
- I Dr J Patel & Partners
- 2 Archway Surgery

DENTISTS
- I Michaels Mr SC & Associates
- 2 Exley Mr NG & Walters Miss L

PHARMACIES
- I Manor Pharmacy

LEISURE
- I Bovingdon Library
- 2 Bovingdon Memorial Hall
- 3 Bovingdon Football Club & Sports Courts
- 4 Recreational Ground (x2)
- 5 Bovingdon Green

RETAIL
- I Costcutter
- 2 Bovindon Village Centre - High Street
- 3 Bovingdon Markets
- 4 Bovingdon Post Office
- 5 Co-Op

OTHER
- I HM Prison The Mount
- 2 Bovingdon Airfield
- 3 Bryants Nurseries
- 4 Place of Worship- Bovingdon Baptist Church
- 5 Place of Worship - St Lawrence CofE Church

PUBLIC TRANSPORT
- Existing Bus Stop
- Bus Route 51
- Bus Route 352
- Bus Route 353

WALKING DISTANCES
- 400m
- 800m

SITE

i-Transport

Centurion House, 129 Deansgate,
Manchester, M3 3WR

Tel: 0161 830 2172
Fax: 0161 830 2173

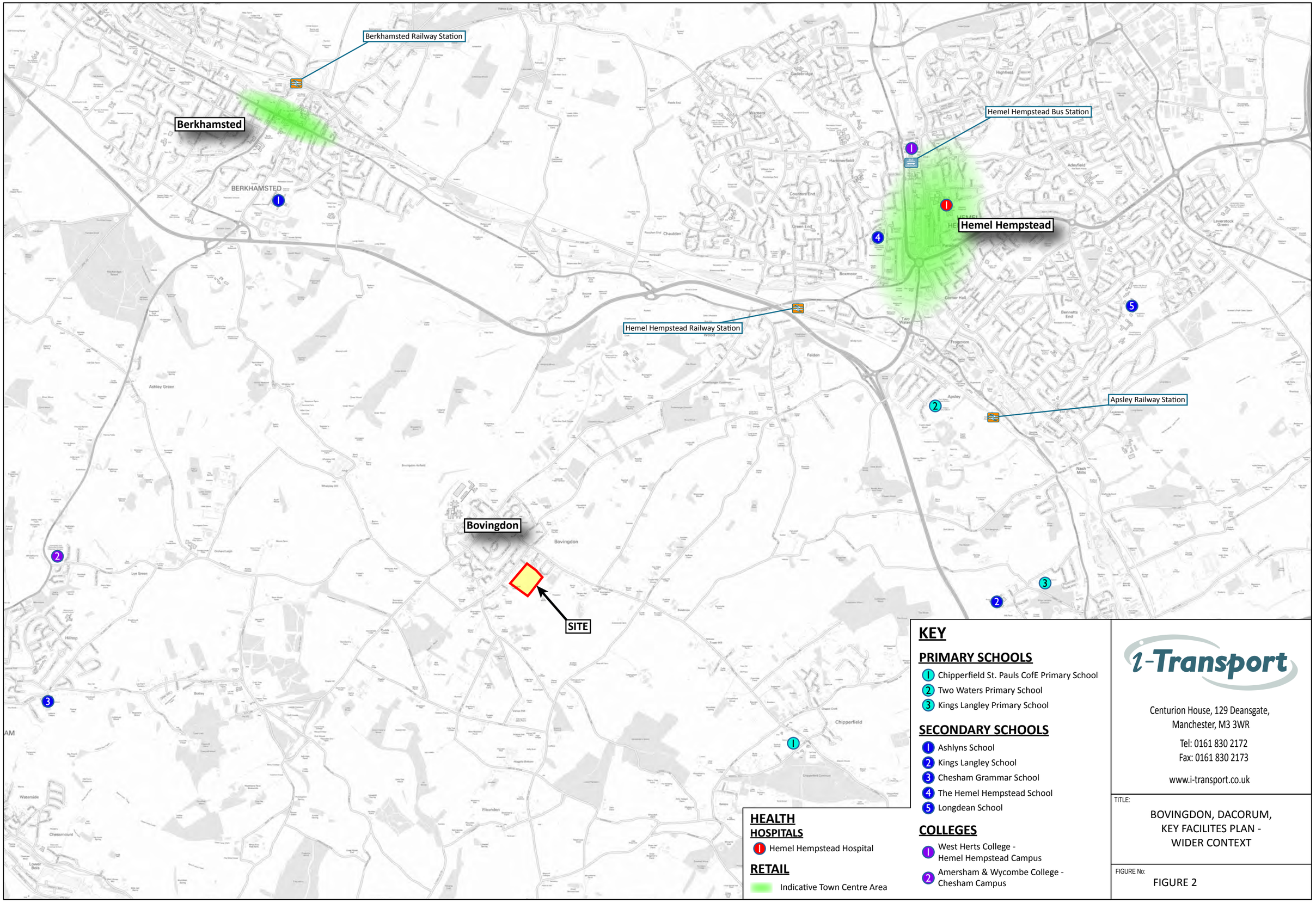
www.i-transport.co.uk

TITLE:

BOVINGDON, DACORUM
LOCAL FACILITIES & EXISTING
PUBLIC TRANSPORT PROVISION

FIGURE No:

FIGURE 1



KEY

PRIMARY SCHOOLS

1. Chipperfield St. Pauls CofE Primary School
2. Two Waters Primary School
3. Kings Langley Primary School

SECONDARY SCHOOLS

1. Ashlyns School
2. Kings Langley School
3. Chesham Grammar School
4. The Hemel Hempstead School
5. Longdean School

COLLEGES

1. West Herts College - Hemel Hempstead Campus
2. Amersham & Wycombe College - Chesham Campus

HEALTH

HOSPITALS

1. Hemel Hempstead Hospital

RETAIL

Indicative Town Centre Area

i-Transport

Centurion House, 129 Deansgate,
Manchester, M3 3WR

Tel: 0161 830 2172
Fax: 0161 830 2173

www.i-transport.co.uk

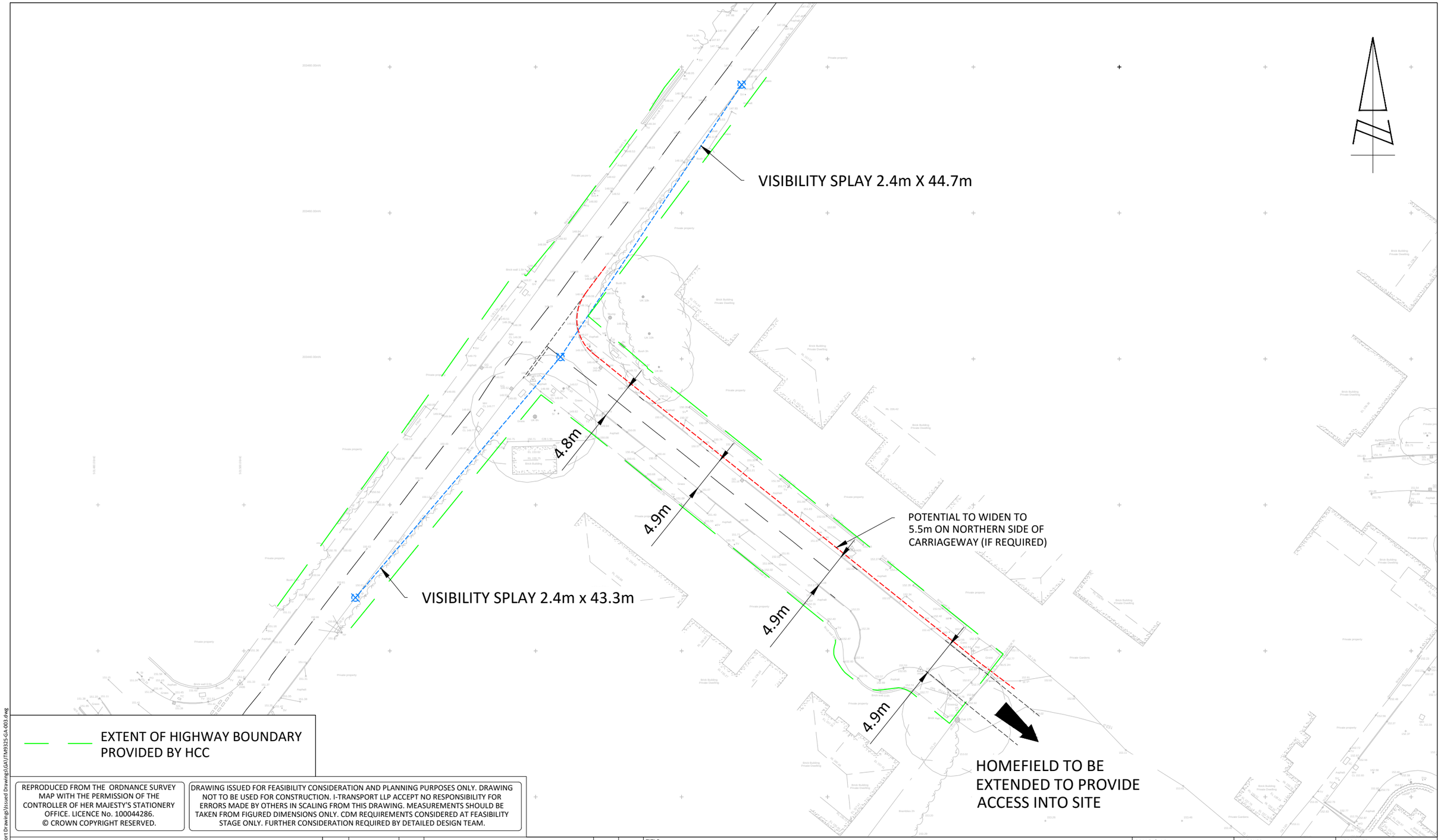
TITLE:

BOVINGDON, DACORUM,
KEY FACILITES PLAN -
WIDER CONTEXT

FIGURE No:

FIGURE 2

APPENDIX C Site Access from Homefield



EXTENT OF HIGHWAY BOUNDARY PROVIDED BY HCC

DRAWING ISSUED FOR FEASIBILITY CONSIDERATION AND PLANNING PURPOSES ONLY. DRAWING NOT TO BE USED FOR CONSTRUCTION. I-TRANSPORT LLP ACCEPT NO RESPONSIBILITY FOR ERRORS MADE BY OTHERS IN SCALING FROM THIS DRAWING. MEASUREMENTS SHOULD BE TAKEN FROM FIGURED DIMENSIONS ONLY. CDM REQUIREMENTS CONSIDERED AT FEASIBILITY STAGE ONLY. FURTHER CONSIDERATION REQUIRED BY DETAILED DESIGN TEAM.

i-Transport
Centurion House, 129 Deansgate
Manchester, M3 3WR
Tel: 0161 830 2172
Fax: 0161 830 2173
www.i-transport.co.uk

REV	DATE	BY	DESCRIPTION	CHK	APD

STATUS: DRAFT

TITLE: SITE ACCESS FROM HOMEFIELD

PROJECT: BOVINGDON, DACORUM

CLIENT: TAYLOR WIMPEY

SCALE @ A3:	CHECKED:	APPROVED:
1:500	JW	VE
FILE REF:	DRAWN:	DATE:
ITM9325-GA	JB	JULY 2016

DRAWING No: ITM9325-GA-003

PROJECT No: ITM9325

REV:

Z:\Projects\9325ITM Bovingdon F2 (Ita)\Tech\Acad\J- Transport Drawings\Issued Drawings\GA\ITM9325-GA-003.dwg

APPENDIX D TRICS Outputs

Calculation Reference: AUDIT-236602-160607-0650

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	EX	ESSEX	1 days
	SC	SURREY	1 days
03	SOUTH WEST		
	DV	DEVON	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	2 days
	SY	SOUTH YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days
09	NORTH		
	CB	CUMBRIA	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 52 to 237 (units:)
Range Selected by User: 50 to 300 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 28/09/15

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	3 days
Tuesday	3 days
Wednesday	1 days
Thursday	3 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	11 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	6
Edge of Town	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	7

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3	11 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	4 days
10,001 to 15,000	2 days
15,001 to 20,000	3 days
20,001 to 25,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	2 days
75,001 to 100,000	3 days
100,001 to 125,000	2 days
125,001 to 250,000	2 days
250,001 to 500,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	9 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	11 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 CB-03-A-04 SEMI DETACHED CUMBRIA
MOORCLOSE ROAD
SALTERBACK
WORKINGTON
Edge of Town
No Sub Category
Total Number of dwellings: 82
Survey date: FRIDAY 24/04/09 Survey Type: MANUAL

2 CH-03-A-06 SEMI-DET./BUNGALOWS CHESHIRE
CREWE ROAD

CREWE
Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 129
Survey date: TUESDAY 14/10/08 Survey Type: MANUAL

3 DV-03-A-03 TERRACED & SEMI DETACHED DEVON
LOWER BRAND LANE

HONITON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 70
Survey date: MONDAY 28/09/15 Survey Type: MANUAL

4 EX-03-A-01 SEMI-DET. ESSEX
MILTON ROAD
CORRINGHAM
STANFORD-LE-HOPE
Edge of Town
Residential Zone
Total Number of dwellings: 237
Survey date: TUESDAY 13/05/08 Survey Type: MANUAL

5 NF-03-A-02 HOUSES & FLATS NORFOLK
DEREHAM ROAD

NORWICH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 98
Survey date: MONDAY 22/10/12 Survey Type: MANUAL

6 NY-03-A-09 MIXED HOUSING NORTH YORKSHIRE
GRAMMAR SCHOOL LANE

NORTHALLERTON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 52
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

7 NY-03-A-10 HOUSES AND FLATS NORTH YORKSHIRE
BOROUGHBRIDGE ROAD

RIPON
Edge of Town
No Sub Category
Total Number of dwellings: 71
Survey date: TUESDAY 17/09/13 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

8 SC-03-A-04 DETACHED & TERRACED SURREY
HIGH ROAD

BYFLEET
Edge of Town
Residential Zone
Total Number of dwellings: 71
Survey date: THURSDAY 23/01/14 Survey Type: MANUAL

9 SH-03-A-04 TERRACED SHROPSHIRE
ST MICHAEL'S STREET

SHREWSBURY
Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 108
Survey date: THURSDAY 11/06/09 Survey Type: MANUAL

10 SH-03-A-05 SEMI-DETACHED/TERRACED SHROPSHIRE
SANDCROFT
SUTTON HILL
TELFORD
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: THURSDAY 24/10/13 Survey Type: MANUAL

11 SY-03-A-01 SEMI DETACHED HOUSES SOUTH YORKSHIRE
A19 BENTLEY ROAD
BENTLEY RISE
DONCASTER
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 54
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
DV-03-A-02	Number of Bungalows
NY-03-A-06	Number of Bungalows/Flats

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.086	11	93	0.291	11	93	0.377
08:00 - 09:00	11	93	0.165	11	93	0.408	11	93	0.573
09:00 - 10:00	11	93	0.152	11	93	0.186	11	93	0.338
10:00 - 11:00	11	93	0.118	11	93	0.159	11	93	0.277
11:00 - 12:00	11	93	0.161	11	93	0.146	11	93	0.307
12:00 - 13:00	11	93	0.168	11	93	0.148	11	93	0.316
13:00 - 14:00	11	93	0.163	11	93	0.157	11	93	0.320
14:00 - 15:00	11	93	0.155	11	93	0.150	11	93	0.305
15:00 - 16:00	11	93	0.289	11	93	0.205	11	93	0.494
16:00 - 17:00	11	93	0.293	11	93	0.177	11	93	0.470
17:00 - 18:00	11	93	0.342	11	93	0.182	11	93	0.524
18:00 - 19:00	11	93	0.228	11	93	0.156	11	93	0.384
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.320			2.365			4.685

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.008	11	93	0.006	11	93	0.014
08:00 - 09:00	11	93	0.002	11	93	0.003	11	93	0.005
09:00 - 10:00	11	93	0.005	11	93	0.003	11	93	0.008
10:00 - 11:00	11	93	0.001	11	93	0.001	11	93	0.002
11:00 - 12:00	11	93	0.003	11	93	0.003	11	93	0.006
12:00 - 13:00	11	93	0.002	11	93	0.002	11	93	0.004
13:00 - 14:00	11	93	0.002	11	93	0.001	11	93	0.003
14:00 - 15:00	11	93	0.005	11	93	0.005	11	93	0.010
15:00 - 16:00	11	93	0.005	11	93	0.004	11	93	0.009
16:00 - 17:00	11	93	0.002	11	93	0.003	11	93	0.005
17:00 - 18:00	11	93	0.004	11	93	0.004	11	93	0.008
18:00 - 19:00	11	93	0.002	11	93	0.002	11	93	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.041			0.037			0.078

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.002	11	93	0.002	11	93	0.004
08:00 - 09:00	11	93	0.001	11	93	0.001	11	93	0.002
09:00 - 10:00	11	93	0.003	11	93	0.001	11	93	0.004
10:00 - 11:00	11	93	0.001	11	93	0.002	11	93	0.003
11:00 - 12:00	11	93	0.005	11	93	0.002	11	93	0.007
12:00 - 13:00	11	93	0.006	11	93	0.007	11	93	0.013
13:00 - 14:00	11	93	0.005	11	93	0.007	11	93	0.012
14:00 - 15:00	11	93	0.000	11	93	0.002	11	93	0.002
15:00 - 16:00	11	93	0.001	11	93	0.001	11	93	0.002
16:00 - 17:00	11	93	0.000	11	93	0.001	11	93	0.001
17:00 - 18:00	11	93	0.001	11	93	0.001	11	93	0.002
18:00 - 19:00	11	93	0.000	11	93	0.000	11	93	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.025			0.027			0.052

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.000	11	93	0.000	11	93	0.000
08:00 - 09:00	11	93	0.001	11	93	0.001	11	93	0.002
09:00 - 10:00	11	93	0.000	11	93	0.000	11	93	0.000
10:00 - 11:00	11	93	0.000	11	93	0.000	11	93	0.000
11:00 - 12:00	11	93	0.003	11	93	0.003	11	93	0.006
12:00 - 13:00	11	93	0.000	11	93	0.000	11	93	0.000
13:00 - 14:00	11	93	0.000	11	93	0.000	11	93	0.000
14:00 - 15:00	11	93	0.000	11	93	0.000	11	93	0.000
15:00 - 16:00	11	93	0.000	11	93	0.000	11	93	0.000
16:00 - 17:00	11	93	0.000	11	93	0.000	11	93	0.000
17:00 - 18:00	11	93	0.000	11	93	0.000	11	93	0.000
18:00 - 19:00	11	93	0.000	11	93	0.000	11	93	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.004			0.004			0.008

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.006	11	93	0.018	11	93	0.024
08:00 - 09:00	11	93	0.001	11	93	0.022	11	93	0.023
09:00 - 10:00	11	93	0.003	11	93	0.010	11	93	0.013
10:00 - 11:00	11	93	0.002	11	93	0.006	11	93	0.008
11:00 - 12:00	11	93	0.004	11	93	0.004	11	93	0.008
12:00 - 13:00	11	93	0.005	11	93	0.004	11	93	0.009
13:00 - 14:00	11	93	0.005	11	93	0.003	11	93	0.008
14:00 - 15:00	11	93	0.006	11	93	0.007	11	93	0.013
15:00 - 16:00	11	93	0.020	11	93	0.010	11	93	0.030
16:00 - 17:00	11	93	0.021	11	93	0.004	11	93	0.025
17:00 - 18:00	11	93	0.022	11	93	0.014	11	93	0.036
18:00 - 19:00	11	93	0.016	11	93	0.009	11	93	0.025
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.111			0.111			0.222

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.096	11	93	0.361	11	93	0.457
08:00 - 09:00	11	93	0.216	11	93	0.609	11	93	0.825
09:00 - 10:00	11	93	0.183	11	93	0.255	11	93	0.438
10:00 - 11:00	11	93	0.150	11	93	0.201	11	93	0.351
11:00 - 12:00	11	93	0.207	11	93	0.190	11	93	0.397
12:00 - 13:00	11	93	0.216	11	93	0.182	11	93	0.398
13:00 - 14:00	11	93	0.210	11	93	0.208	11	93	0.418
14:00 - 15:00	11	93	0.195	11	93	0.188	11	93	0.383
15:00 - 16:00	11	93	0.442	11	93	0.288	11	93	0.730
16:00 - 17:00	11	93	0.401	11	93	0.240	11	93	0.641
17:00 - 18:00	11	93	0.440	11	93	0.226	11	93	0.666
18:00 - 19:00	11	93	0.294	11	93	0.221	11	93	0.515
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.050			3.169			6.219

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.024	11	93	0.094	11	93	0.118
08:00 - 09:00	11	93	0.052	11	93	0.186	11	93	0.238
09:00 - 10:00	11	93	0.052	11	93	0.065	11	93	0.117
10:00 - 11:00	11	93	0.027	11	93	0.048	11	93	0.075
11:00 - 12:00	11	93	0.032	11	93	0.026	11	93	0.058
12:00 - 13:00	11	93	0.038	11	93	0.026	11	93	0.064
13:00 - 14:00	11	93	0.034	11	93	0.045	11	93	0.079
14:00 - 15:00	11	93	0.032	11	93	0.042	11	93	0.074
15:00 - 16:00	11	93	0.180	11	93	0.076	11	93	0.256
16:00 - 17:00	11	93	0.097	11	93	0.051	11	93	0.148
17:00 - 18:00	11	93	0.098	11	93	0.045	11	93	0.143
18:00 - 19:00	11	93	0.071	11	93	0.046	11	93	0.117
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.737			0.750			1.487

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.001	11	93	0.008	11	93	0.009
08:00 - 09:00	11	93	0.004	11	93	0.011	11	93	0.015
09:00 - 10:00	11	93	0.001	11	93	0.007	11	93	0.008
10:00 - 11:00	11	93	0.004	11	93	0.009	11	93	0.013
11:00 - 12:00	11	93	0.003	11	93	0.008	11	93	0.011
12:00 - 13:00	11	93	0.009	11	93	0.007	11	93	0.016
13:00 - 14:00	11	93	0.008	11	93	0.001	11	93	0.009
14:00 - 15:00	11	93	0.004	11	93	0.006	11	93	0.010
15:00 - 16:00	11	93	0.001	11	93	0.003	11	93	0.004
16:00 - 17:00	11	93	0.007	11	93	0.001	11	93	0.008
17:00 - 18:00	11	93	0.015	11	93	0.003	11	93	0.018
18:00 - 19:00	11	93	0.012	11	93	0.000	11	93	0.012
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.069			0.064			0.133

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL RAIL PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.000	11	93	0.009	11	93	0.009
08:00 - 09:00	11	93	0.000	11	93	0.003	11	93	0.003
09:00 - 10:00	11	93	0.000	11	93	0.003	11	93	0.003
10:00 - 11:00	11	93	0.000	11	93	0.001	11	93	0.001
11:00 - 12:00	11	93	0.000	11	93	0.001	11	93	0.001
12:00 - 13:00	11	93	0.000	11	93	0.001	11	93	0.001
13:00 - 14:00	11	93	0.000	11	93	0.000	11	93	0.000
14:00 - 15:00	11	93	0.001	11	93	0.001	11	93	0.002
15:00 - 16:00	11	93	0.001	11	93	0.003	11	93	0.004
16:00 - 17:00	11	93	0.000	11	93	0.000	11	93	0.000
17:00 - 18:00	11	93	0.005	11	93	0.000	11	93	0.005
18:00 - 19:00	11	93	0.005	11	93	0.000	11	93	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.012			0.022			0.034

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL COACH PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.000	11	93	0.000	11	93	0.000
08:00 - 09:00	11	93	0.001	11	93	0.004	11	93	0.005
09:00 - 10:00	11	93	0.000	11	93	0.000	11	93	0.000
10:00 - 11:00	11	93	0.000	11	93	0.000	11	93	0.000
11:00 - 12:00	11	93	0.004	11	93	0.001	11	93	0.005
12:00 - 13:00	11	93	0.000	11	93	0.000	11	93	0.000
13:00 - 14:00	11	93	0.000	11	93	0.000	11	93	0.000
14:00 - 15:00	11	93	0.000	11	93	0.000	11	93	0.000
15:00 - 16:00	11	93	0.000	11	93	0.000	11	93	0.000
16:00 - 17:00	11	93	0.000	11	93	0.000	11	93	0.000
17:00 - 18:00	11	93	0.000	11	93	0.000	11	93	0.000
18:00 - 19:00	11	93	0.000	11	93	0.000	11	93	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.005			0.010

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.001	11	93	0.017	11	93	0.018
08:00 - 09:00	11	93	0.005	11	93	0.018	11	93	0.023
09:00 - 10:00	11	93	0.001	11	93	0.010	11	93	0.011
10:00 - 11:00	11	93	0.004	11	93	0.010	11	93	0.014
11:00 - 12:00	11	93	0.007	11	93	0.010	11	93	0.017
12:00 - 13:00	11	93	0.009	11	93	0.008	11	93	0.017
13:00 - 14:00	11	93	0.008	11	93	0.001	11	93	0.009
14:00 - 15:00	11	93	0.005	11	93	0.007	11	93	0.012
15:00 - 16:00	11	93	0.002	11	93	0.006	11	93	0.008
16:00 - 17:00	11	93	0.007	11	93	0.001	11	93	0.008
17:00 - 18:00	11	93	0.019	11	93	0.003	11	93	0.022
18:00 - 19:00	11	93	0.017	11	93	0.000	11	93	0.017
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.085			0.091			0.176

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	52 - 237 (units:)
Survey date date range:	01/01/08 - 28/09/15
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	93	0.128	11	93	0.488	11	93	0.616
08:00 - 09:00	11	93	0.274	11	93	0.835	11	93	1.109
09:00 - 10:00	11	93	0.239	11	93	0.340	11	93	0.579
10:00 - 11:00	11	93	0.183	11	93	0.264	11	93	0.447
11:00 - 12:00	11	93	0.250	11	93	0.230	11	93	0.480
12:00 - 13:00	11	93	0.268	11	93	0.220	11	93	0.488
13:00 - 14:00	11	93	0.256	11	93	0.256	11	93	0.512
14:00 - 15:00	11	93	0.238	11	93	0.244	11	93	0.482
15:00 - 16:00	11	93	0.645	11	93	0.380	11	93	1.025
16:00 - 17:00	11	93	0.526	11	93	0.295	11	93	0.821
17:00 - 18:00	11	93	0.580	11	93	0.288	11	93	0.868
18:00 - 19:00	11	93	0.398	11	93	0.276	11	93	0.674
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.985			4.116			8.101

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

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Number of Sundays:	0
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This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX E Trip Generation, Purpose and Distribution Calculations

	AM Peak			PM Peak		
	In	Out	2-Way	In	Out	2-Way
HB Work	13	33	46	21	11	31
HB Employers Business	1	3	5	3	1	4
Sub Total	**15**	**36**	**51**	**23**	**12**	**36**
HB Education	2	6	8	2	1	3
HB Shopping	2	4	6	7	4	11
HB Personal Business	1	1	2	2	1	3
HB Recreation/Social	1	3	5	5	3	7
HB Visiting Friends and Relatives	1	2	3	5	2	7
HB Holiday/Day Trip	0	0	0	1	0	1
Sub Total	**7**	**17**	**24**	**21**	**11**	**33**
Total	**21**	**53**	**74**	**44**	**24**	**68**

SW S CENSUS ANALYSIS		AM Peak			PM Peak		
		In	Out	2-Way	In	Out	2-Way
B4505 Hempstead Road (N)	40.13%	6	15	20	9	5	14
Chipperfield Road (E)	35.35%	5	13	18	8	4	13
Long Lane (SE)	7.27%	1	3	4	2	1	3
Leyhill Road (SW)	1.61%	0	1	1	0	0	1
Chesham Road (W)	12.41%	2	4	6	3	2	4
Bovingdon - Intenal	3.23%	0	1	2	1	0	1

EDUCATION		AM Peak			PM Peak		
		In	Out	2-Way	In	Out	2-Way
B4505 Hempstead Road (N)	0.00%	0	0	0	0	0	0
Chipperfield Road (E)	25.00%	1	1	2	0	0	1
Long Lane (SE)	0.00%	0	0	0	0	0	0
Leyhill Road (SW)	25.00%	1	1	2	0	0	1
Chesham Road (W)	0.00%	0	0	0	0	0	0
Bovingdon - Intenal	50.00%	1	3	4	1	0	1

SHOPPING		AM Peak			PM Peak		
		In	Out	2-Way	In	Out	2-Way
B4505 Hempstead Road (N)	75.00%	1	3	4	5	3	8
Chipperfield Road (E)	0.00%	0	0	0	0	0	0
Long Lane (SE)	0.00%	0	0	0	0	0	0
Leyhill Road (SW)	0.00%	0	0	0	0	0	0
Chesham Road (W)	0.00%	0	0	0	0	0	0
Bovingdon - Intenal	25.00%	0	1	1	2	1	3

ALL OTHERS		AM Peak			PM Peak		
		In	Out	2-Way	In	Out	2-Way
B4505 Hempstead Road (N)	50.00%	1	3	5	6	3	9
Chipperfield Road (E)	25.00%	1	2	2	3	2	5
Long Lane (SE)	0.00%	0	0	0	0	0	0
Leyhill Road (SW)	0.00%	0	0	0	0	0	0
Chesham Road (W)	0.00%	0	0	0	0	0	0
Bovingdon - Intenal	25.00%	1	2	2	3	2	5

TOTAL		AM Peak			PM Peak		
		In	Out	2-Way	In	Out	2-Way
B4505 Hempstead Road (N)	43.06%	8	21	29	21	11	32
Chipperfield Road (E)	28.35%	6	16	23	12	6	18
Long Lane (SE)	4.41%	1	3	4	2	1	3
Leyhill Road (SW)	2.91%	1	2	3	1	0	1
Chesham Road (W)	7.53%	2	4	6	3	2	4
Bovingdon - Intenal	13.73%	3	7	10	6	3	10

Trip Purpose	Split		%
Education (Primary)	50%	Bovingdon Primary	100%
Education (Secondary)	50%	Kings Langley School	50%
		Chesham Grammar	50%
Food Shopping	50%	Berkhamsted Waitrose	25%
		Hemel Hempstead Sainsburys	25%
		Hemel Hempstead Tesco	25%
		Bovingdon Co-op	12.50%
		Bovingdon Tesco Express	12.50%
Non Food	50%	Hemel Hempstead	75%
		Bovingdon High Street	25%
Other	100%	Bovingdon High Street	25%
		Hemel Hempstead	50%
		London / M25	25%

APPENDIX F Junction Capacity Assessments

Junctions 9

ARCADY 9 - Roundabout Module

Filename: B4505_Newhouse_High Street.j9
Path: Z:\Projects\9325ITM Bovingdon F2 (F1a)\Tech\Junction Assessments\Arcady
Report generation date: 29/06/2016 11:19:10

Summary of junction performance

	AM						PM					
	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap
Existing Layout - 2016 Survey												
Junction 1 - Arm 1	0.1	5.72	0.06	A	15.21	9 % [Junction 1 - Arm 2]	0.0	5.37	0.04	A	8.33	33 % [Junction 1 - Arm 3]
Junction 1 - Arm 2	4.5	22.00	0.83	C			1.5	9.66	0.60	A		
Junction 1 - Arm 3	0.0	7.32	0.56	A			0.0	7.22	0.55	A		
Junction 2 - Arm 1	0.6	8.19	0.37	A	9.25		0.8	8.22	0.44	A	6.94	
Junction 2 - Arm 2	1.4	9.51	0.59	A			0.9	7.66	0.47	A		
Junction 2 - Arm 3	0.0	9.42	0.68	A			0.0	5.61	0.47	A		
Existing Layout - 2021 Base + Comm												
Junction 1 - Arm 1	0.1	6.16	0.07	A	23.25	-1 % [Junction 1 - Arm 2]	0.0	5.69	0.04	A	9.81	27 % [Junction 1 - Arm 3]
Junction 1 - Arm 2	7.9	36.15	0.90	E			2.0	11.71	0.67	B		
Junction 1 - Arm 3	0.0	8.44	0.62	A			0.0	8.16	0.60	A		
Junction 2 - Arm 1	0.8	9.42	0.43	A	11.90		1.1	9.93	0.52	A	8.14	
Junction 2 - Arm 2	2.2	12.71	0.69	B			1.2	9.01	0.55	A		
Junction 2 - Arm 3	0.0	12.15	0.76	B			0.0	6.35	0.53	A		
Existing Layout - 2021 With Dev												
Junction 1 - Arm 1	0.1	6.32	0.07	A	25.01	-2 % [Junction 1 - Arm 2]	0.0	5.75	0.04	A	9.88	26 % [Junction 1 - Arm 3]
Junction 1 - Arm 2	8.6	39.31	0.91	E			2.0	11.67	0.67	B		
Junction 1 - Arm 3	0.0	8.90	0.64	A			0.0	8.38	0.62	A		
Junction 2 - Arm 1	0.9	10.02	0.47	B	12.37		1.1	10.01	0.53	B	8.23	
Junction 2 - Arm 2	2.3	13.36	0.70	B			1.2	9.17	0.55	A		
Junction 2 - Arm 3	0.0	12.50	0.76	B			0.0	6.34	0.53	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted Av.s. Res Cap indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	Existing Layout
Location	B4505 / Newhouse / High Street
Site number	
Date	13/06/2016
Version	
Status	Existing
Identifier	
Client	Taylor Wimpy
Jobnumber	ITM9325
Enumerator	JDW
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
JUNCTIONS 9	5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Existing Layout	✓	100.000	100.000

Existing Layout - 2016 Survey, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Mini-roundabout	Junction 2	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 83% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	15.21	C
2	B4505 / High Street	Mini-roundabout	1,2,3	9.25	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		9	Junction 1 - Arm 2

Arms

Arms

Junction	Arm	Name	Description
1	1	Newhouse	
	2	B4505 (North)	
	3	Internal	
2	1	High Street	
	2	B4505 (South)	
	3	Internal	

Mini Roundabout Geometry

Junction	Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	1	3.00	3.00	5.70	5.3	11.10	6.50	0.0	
	2	3.20	3.20	3.60	0.8	11.00	8.90	0.0	
	3	4.90	4.90	4.90	0.0	9.50	8.00	0.0	
2	1	3.10	2.90	5.30	2.3	10.60	7.90	0.0	
	2	2.60	2.60	3.40	34.9	8.40	5.50	0.0	
	3	5.90	5.90	5.90	0.0	6.70	5.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Junction	Arm	Final slope	Final intercept (PCU/hr)
1	1	0.629	1046
	2	0.605	940
	3	0.663	1097
2	1	0.608	990
	2	0.603	1037
	3	0.700	1238

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	37	100.000
	2		ONE HOUR	✓	697	100.000
	3	✓				
2	1		ONE HOUR	✓	238	100.000
	2		ONE HOUR	✓	487	100.000
	3	✓				

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		1	2	3
From	1	0	18	19
	2	5	0	692
	3	12	542	0

Demand (PCU/hr)

Junction 2

		To		
		1	2	3
From	1	0	53	185
	2	117	0	370
	3	280	431	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.06	5.72	0.1	A	34	51
	2	0.83	22.00	4.5	C	640	959
	3	0.56	7.32	0.0	A	509	763
2	1	0.37	8.19	0.6	A	218	328
	2	0.59	9.51	1.4	A	447	670
	3	0.68	9.42	0.0	A	652	977

Main Results for each time segment

07:30 - 07:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	406	791	0.035	28	13	0.0	0.0	4.718	A
	2	525	131	14	932	0.563	520	420	0.0	1.3	8.633	A
	3	415	104	4	1094	0.379	415	530	0.0	0.0	5.264	A
2	1	179	45	321	794	0.226	178	296	0.0	0.3	5.830	A
	2	367	92	138	954	0.384	364	361	0.0	0.6	6.080	A
	3	530	133	87	1177	0.451	530	415	0.0	0.0	5.511	A

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	33	8	487	740	0.045	33	15	0.0	0.0	5.095	A
	2	627	157	17	930	0.674	624	503	1.3	2.0	11.632	B
	3	498	124	4	1094	0.455	498	636	0.0	0.0	5.977	A
2	1	214	53	386	755	0.283	214	356	0.3	0.4	6.641	A
	2	438	109	166	937	0.467	437	433	0.6	0.9	7.181	A
	3	636	159	105	1165	0.546	636	498	0.0	0.0	6.695	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	41	10	596	671	0.061	41	19	0.0	0.1	5.707	A
	2	767	192	21	928	0.827	758	615	2.0	4.3	20.208	C
	3	609	152	5	1093	0.557	609	774	0.0	0.0	7.288	A
2	1	262	66	469	705	0.372	261	433	0.4	0.6	8.104	A
	2	536	134	203	915	0.586	534	527	0.9	1.4	9.406	A
	3	774	193	128	1148	0.674	774	609	0.0	0.0	9.229	A

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	41	10	598	670	0.061	41	19	0.1	0.1	5.719	A
	2	767	192	21	928	0.827	766	618	4.3	4.5	21.995	C
	3	611	153	5	1093	0.559	611	782	0.0	0.0	7.320	A
2	1	262	66	474	702	0.373	262	437	0.6	0.6	8.188	A
	2	536	134	204	914	0.586	536	532	1.4	1.4	9.513	A
	3	782	195	129	1148	0.681	782	611	0.0	0.0	9.423	A

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	33	8	490	738	0.045	33	15	0.1	0.0	5.110	A
	2	627	157	17	930	0.674	636	506	4.5	2.1	12.602	B
	3	501	125	5	1094	0.458	501	649	0.0	0.0	6.007	A
2	1	214	53	393	751	0.285	215	361	0.6	0.4	6.724	A
	2	438	109	167	937	0.467	440	441	1.4	0.9	7.276	A
	3	649	162	106	1164	0.557	649	501	0.0	0.0	6.852	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	410	788	0.035	28	13	0.0	0.0	4.735	A
	2	525	131	14	932	0.563	528	423	2.1	1.3	8.988	A
	3	419	105	4	1094	0.383	419	539	0.0	0.0	5.293	A
2	1	179	45	326	791	0.226	180	300	0.4	0.3	5.891	A
	2	367	92	140	953	0.385	368	366	0.9	0.6	6.163	A
	3	539	135	88	1176	0.458	539	419	0.0	0.0	5.587	A

Existing Layout - 2016 Survey, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	8.33	A
2	B4505 / High Street	Mini-roundabout	1,2,3	6.94	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		33	Junction 1 - Arm 3

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	23	100.000
	2		ONE HOUR	✓	508	100.000
	3	✓				
2	1		ONE HOUR	✓	313	100.000
	2		ONE HOUR	✓	383	100.000
	3	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	10	13
	2	16	0	492
	3	35	505	0

Junction 2

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	94	219
	2	61	0	322
	3	195	310	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.04	5.37	0.0	A	21	32
	2	0.60	9.66	1.5	A	466	699
	3	0.55	7.22	0.0	A	496	744
2	1	0.44	8.22	0.8	A	287	431
	2	0.47	7.66	0.9	A	351	527
	3	0.47	5.61	0.0	A	463	694

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	17	4	379	808	0.021	17	38	0.0	0.0	4.552	A
	2	382	96	10	935	0.409	380	386	0.0	0.7	6.458	A
	3	405	101	12	1089	0.372	405	377	0.0	0.0	5.227	A
2	1	236	59	232	849	0.278	234	191	0.0	0.4	5.842	A
	2	288	72	164	938	0.307	287	302	0.0	0.4	5.509	A
	3	377	94	46	1206	0.313	377	405	0.0	0.0	4.325	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	21	5	454	761	0.027	21	46	0.0	0.0	4.865	A
	2	457	114	12	933	0.489	456	463	0.7	0.9	7.518	A
	3	485	121	14	1087	0.447	485	453	0.0	0.0	5.921	A
2	1	281	70	278	821	0.343	281	230	0.4	0.5	6.661	A
	2	344	86	196	919	0.375	344	362	0.4	0.6	6.254	A
	3	453	113	55	1200	0.378	453	485	0.0	0.0	4.789	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	25	6	555	697	0.036	25	56	0.0	0.0	5.361	A
	2	559	140	14	932	0.600	557	566	0.9	1.5	9.557	A
	3	594	148	18	1085	0.547	594	554	0.0	0.0	7.194	A
2	1	345	86	340	783	0.440	344	281	0.5	0.8	8.172	A
	2	422	105	240	892	0.473	421	443	0.6	0.9	7.614	A
	3	554	138	67	1191	0.465	554	594	0.0	0.0	5.588	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	25	6	557	696	0.036	25	56	0.0	0.0	5.369	A
	2	559	140	14	932	0.600	559	568	1.5	1.5	9.659	A
	3	596	149	18	1085	0.549	596	556	0.0	0.0	7.216	A
2	1	345	86	341	782	0.441	345	282	0.8	0.8	8.223	A
	2	422	105	241	892	0.473	422	445	0.9	0.9	7.657	A
	3	556	139	67	1191	0.467	556	596	0.0	0.0	5.607	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	21	5	456	759	0.027	21	46	0.0	0.0	4.875	A
	2	457	114	12	933	0.489	459	465	1.5	1.0	7.616	A
	3	488	122	14	1087	0.449	488	456	0.0	0.0	5.947	A
2	1	281	70	280	820	0.343	282	231	0.8	0.5	6.713	A
	2	344	86	198	918	0.375	345	365	0.9	0.6	6.298	A
	3	456	114	55	1200	0.380	456	488	0.0	0.0	4.810	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	17	4	382	806	0.021	17	39	0.0	0.0	4.564	A
	2	382	96	10	935	0.409	384	389	1.0	0.7	6.546	A
	3	408	102	12	1089	0.375	408	381	0.0	0.0	5.254	A
2	1	236	59	234	847	0.278	236	193	0.5	0.4	5.894	A
	2	288	72	165	938	0.308	289	305	0.6	0.4	5.557	A
	3	381	95	46	1206	0.316	381	408	0.0	0.0	4.346	A

Existing Layout - 2021 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Mini-roundabout	Junction 2	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 83% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	23.25	C
2	B4505 / High Street	Mini-roundabout	1,2,3	11.90	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-1	Junction 1 - Arm 2

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	40	100.000
	2		ONE HOUR	✓	761	100.000
	3	✓				
2	1		ONE HOUR	✓	264	100.000
	2		ONE HOUR	✓	566	100.000
	3	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	20	20
	2	5	0	756
	3	13	604	0

Junction 2

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	66	198
	2	147	0	419
	3	301	476	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.07	6.16	0.1	A	37	55
	2	0.90	36.15	7.9	E	698	1047
	3	0.62	8.44	0.0	A	566	848
2	1	0.43	9.42	0.8	A	242	363
	2	0.69	12.71	2.2	B	519	779
	3	0.76	12.15	0.0	B	711	1066

Main Results for each time segment

07:30 - 07:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	30	8	451	762	0.040	30	13	0.0	0.0	4.914	A
	2	573	143	15	931	0.615	567	466	0.0	1.6	9.715	A
	3	461	115	4	1094	0.421	461	578	0.0	0.0	5.636	A
2	1	199	50	354	775	0.257	197	334	0.0	0.3	6.228	A
	2	426	107	148	948	0.450	423	403	0.0	0.8	6.817	A
	3	578	144	110	1161	0.498	578	461	0.0	0.0	6.091	A

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	36	9	541	706	0.051	36	16	0.0	0.1	5.376	A
	2	684	171	18	930	0.736	680	559	1.6	2.6	14.158	B
	3	553	138	4	1094	0.506	553	693	0.0	0.0	6.562	A
2	1	237	59	425	732	0.324	237	400	0.3	0.5	7.268	A
	2	509	127	178	930	0.547	507	484	0.8	1.2	8.483	A
	3	693	173	132	1146	0.605	693	553	0.0	0.0	7.753	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	44	11	662	630	0.070	44	20	0.1	0.1	6.143	A
	2	838	209	22	927	0.904	820	684	2.6	7.0	29.677	D
	3	676	169	5	1093	0.618	676	837	0.0	0.0	8.378	A
2	1	291	73	513	678	0.429	290	485	0.5	0.7	9.246	A
	2	623	156	217	906	0.688	619	585	1.2	2.1	12.394	B
	3	837	209	161	1125	0.744	837	676	0.0	0.0	11.628	B

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	44	11	665	628	0.070	44	20	0.1	0.1	6.165	A
	2	838	209	22	927	0.904	834	687	7.0	7.9	36.150	E
	3	679	170	5	1093	0.621	679	851	0.0	0.0	8.442	A
2	1	291	73	521	673	0.432	291	491	0.7	0.8	9.416	A
	2	623	156	218	906	0.688	623	594	2.1	2.2	12.709	B
	3	851	213	162	1125	0.757	851	679	0.0	0.0	12.154	B

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	36	9	546	702	0.051	36	16	0.1	0.1	5.402	A
	2	684	171	18	930	0.736	704	564	7.9	3.0	17.154	C
	3	558	140	5	1094	0.510	558	717	0.0	0.0	6.622	A
2	1	237	59	439	723	0.328	238	411	0.8	0.5	7.448	A
	2	509	127	179	929	0.547	513	499	2.2	1.2	8.711	A
	3	717	179	133	1145	0.626	717	558	0.0	0.0	8.172	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	30	8	456	759	0.040	30	14	0.1	0.0	4.940	A
	2	573	143	15	931	0.615	578	471	3.0	1.6	10.339	B
	3	466	117	4	1094	0.426	466	589	0.0	0.0	5.679	A
2	1	199	50	361	770	0.258	199	339	0.5	0.4	6.313	A
	2	426	107	149	947	0.450	428	411	1.2	0.8	6.953	A
	3	589	147	111	1160	0.508	589	466	0.0	0.0	6.218	A

Existing Layout - 2021 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	9.81	A
2	B4505 / High Street	Mini-roundabout	1,2,3	8.14	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		27	Junction 1 - Arm 3

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	25	100.000
	2		ONE HOUR	✓	567	100.000
	3	✓				
2	1		ONE HOUR	✓	354	100.000
	2		ONE HOUR	✓	438	100.000
	3	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	11	14
	2	17	0	550
	3	38	558	0

Junction 2

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	120	234
	2	77	0	361
	3	209	355	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.04	5.69	0.0	A	23	34
	2	0.67	11.71	2.0	B	520	780
	3	0.60	8.16	0.0	A	545	818
2	1	0.52	9.93	1.1	A	325	487
	2	0.55	9.01	1.2	A	402	603
	3	0.53	6.35	0.0	A	517	775

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	19	5	417	784	0.024	19	41	0.0	0.0	4.703	A
	2	427	107	10	934	0.457	424	425	0.0	0.8	7.007	A
	3	445	111	13	1088	0.409	445	421	0.0	0.0	5.549	A
2	1	267	67	265	829	0.322	265	214	0.0	0.5	6.364	A
	2	330	82	175	932	0.354	328	355	0.0	0.5	5.937	A
	3	421	105	58	1198	0.352	421	445	0.0	0.0	4.609	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	22	6	500	732	0.031	22	49	0.0	0.0	5.074	A
	2	510	127	13	933	0.546	508	510	0.8	1.2	8.451	A
	3	534	133	15	1087	0.491	534	506	0.0	0.0	6.423	A
2	1	318	80	318	796	0.400	317	256	0.5	0.7	7.506	A
	2	394	98	210	911	0.432	393	426	0.5	0.8	6.942	A
	3	506	126	69	1190	0.425	506	534	0.0	0.0	5.218	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	611	662	0.042	27	60	0.0	0.0	5.675	A
	2	624	156	15	931	0.670	621	623	1.2	2.0	11.495	B
	3	653	163	19	1084	0.602	653	618	0.0	0.0	8.122	A
2	1	390	97	389	753	0.517	388	313	0.7	1.0	9.816	A
	2	482	121	257	882	0.547	481	521	0.8	1.2	8.918	A
	3	618	154	84	1179	0.524	618	653	0.0	0.0	6.320	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	613	660	0.042	28	60	0.0	0.0	5.688	A
	2	624	156	15	931	0.670	624	625	2.0	2.0	11.711	B
	3	655	164	19	1084	0.604	655	621	0.0	0.0	8.164	A
2	1	390	97	391	752	0.518	390	315	1.0	1.1	9.928	A
	2	482	121	258	882	0.547	482	523	1.2	1.2	9.005	A
	3	621	155	85	1179	0.527	621	655	0.0	0.0	6.353	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	22	6	503	730	0.031	23	50	0.0	0.0	5.090	A
	2	510	127	13	933	0.546	513	513	2.0	1.2	8.632	A
	3	537	134	15	1087	0.495	537	510	0.0	0.0	6.466	A
2	1	318	80	321	795	0.401	320	259	1.1	0.7	7.608	A
	2	394	98	211	910	0.433	395	429	1.2	0.8	7.022	A
	3	510	128	70	1189	0.429	510	537	0.0	0.0	5.255	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	19	5	421	782	0.024	19	41	0.0	0.0	4.719	A
	2	427	107	11	934	0.457	428	429	1.2	0.9	7.139	A
	3	449	112	13	1088	0.413	449	426	0.0	0.0	5.586	A
2	1	267	67	268	827	0.322	267	216	0.7	0.5	6.443	A
	2	330	82	177	931	0.354	331	359	0.8	0.6	6.008	A
	3	426	107	58	1197	0.356	426	449	0.0	0.0	4.641	A

Existing Layout - 2021 With Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Mini-roundabout	Junction 2	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 82% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	25.01	D
2	B4505 / High Street	Mini-roundabout	1,2,3	12.37	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-2	Junction 1 - Arm 2

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	40	100.000
	2		ONE HOUR	✓	770	100.000
	3	✓				
2	1		ONE HOUR	✓	285	100.000
	2		ONE HOUR	✓	566	100.000
	3	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	20	20
	2	5	0	765
	3	13	625	0

Junction 2

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	66	219
	2	147	0	419
	3	309	476	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.07	6.32	0.1	A	37	55
	2	0.91	39.31	8.6	E	707	1060
	3	0.64	8.90	0.0	A	585	877
2	1	0.47	10.02	0.9	B	262	392
	2	0.70	13.36	2.3	B	519	779
	3	0.76	12.50	0.0	B	719	1079

Main Results for each time segment

07:30 - 07:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	30	8	467	752	0.040	30	13	0.0	0.0	4.981	A
	2	580	145	15	931	0.622	573	482	0.0	1.6	9.886	A
	3	477	119	4	1094	0.436	477	585	0.0	0.0	5.774	A
2	1	215	54	354	774	0.277	213	340	0.0	0.4	6.398	A
	2	426	107	164	938	0.454	423	404	0.0	0.8	6.940	A
	3	585	146	110	1161	0.503	585	477	0.0	0.0	6.158	A

07:45 - 08:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	36	9	560	694	0.052	36	16	0.0	0.1	5.472	A
	2	692	173	18	930	0.745	688	578	1.6	2.8	14.594	B
	3	572	143	4	1094	0.523	572	701	0.0	0.0	6.787	A
2	1	256	64	425	731	0.350	256	408	0.4	0.5	7.558	A
	2	509	127	196	919	0.554	507	484	0.8	1.2	8.707	A
	3	701	175	132	1146	0.612	701	572	0.0	0.0	7.880	A

08:00 - 08:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	44	11	684	616	0.072	44	20	0.1	0.1	6.297	A
	2	848	212	22	927	0.914	828	706	2.8	7.6	31.506	D
	3	699	175	5	1093	0.639	699	845	0.0	0.0	8.823	A
2	1	314	78	512	678	0.463	313	493	0.5	0.8	9.809	A
	2	623	156	240	892	0.698	619	585	1.2	2.2	12.987	B
	3	845	211	161	1126	0.751	845	699	0.0	0.0	11.910	B

08:15 - 08:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	44	11	688	613	0.072	44	20	0.1	0.1	6.322	A
	2	848	212	22	927	0.914	844	710	7.6	8.6	39.314	E
	3	702	176	5	1093	0.642	702	860	0.0	0.0	8.901	A
2	1	314	78	522	673	0.466	314	500	0.8	0.9	10.024	B
	2	623	156	241	892	0.699	623	594	2.2	2.3	13.364	B
	3	860	215	162	1125	0.765	860	702	0.0	0.0	12.501	B

08:30 - 08:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	36	9	566	690	0.052	36	16	0.1	0.1	5.502	A
	2	692	173	18	930	0.745	714	584	8.6	3.1	18.205	C
	3	577	144	5	1094	0.528	577	728	0.0	0.0	6.858	A
2	1	256	64	441	721	0.355	257	420	0.9	0.6	7.779	A
	2	509	127	198	918	0.554	513	501	2.3	1.3	8.973	A
	3	728	182	133	1145	0.636	728	577	0.0	0.0	8.366	A

08:45 - 09:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	30	8	472	749	0.040	30	14	0.1	0.0	5.007	A
	2	580	145	15	931	0.622	585	487	3.1	1.7	10.567	B
	3	482	121	4	1094	0.441	482	597	0.0	0.0	5.823	A
2	1	215	54	362	770	0.279	215	346	0.6	0.4	6.498	A
	2	426	107	165	937	0.455	428	412	1.3	0.8	7.086	A
	3	597	149	111	1160	0.514	597	482	0.0	0.0	6.295	A

Existing Layout - 2021 With Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout	Junction 1	Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 97% of the total flow for the roundabout for one or more time segments]
Warning	Linked Roundabout	Junction 1 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 3	Internal storage space between linked junctions is small (1 PCU PCU). Linked junction results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Vehicle Mix	Junction 1	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.
Warning	Vehicle Mix	Junction 2	HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	B4505 / Newhouse	Mini-roundabout	1,2,3	9.88	A
2	B4505 / High Street	Mini-roundabout	1,2,3	8.23	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		26	Junction 1 - Arm 3

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	3	2	3	Closely spaced	Normal	0	100.00	1.00
2	3	1	3	Closely spaced	Normal	0	100.00	1.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	25	100.000
	2		ONE HOUR	✓	566	100.000
	3	✓				
2	1		ONE HOUR	✓	365	100.000
	2		ONE HOUR	✓	438	100.000
	3	✓				

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	11	14
	2	17	0	549
	3	38	553	0

Junction 2

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	120	245
	2	77	0	361
	3	230	355	0

Vehicle Mix

Junction 1

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Junction 2

HV %s

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	0.04	5.75	0.0	A	23	34
	2	0.67	11.67	2.0	B	519	779
	3	0.62	8.38	0.0	A	556	833
2	1	0.53	10.01	1.1	B	335	502
	2	0.55	9.17	1.2	A	402	603
	3	0.53	6.34	0.0	A	516	774

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	19	5	424	779	0.024	19	42	0.0	0.0	4.732	A
	2	426	107	10	934	0.456	423	432	0.0	0.8	6.997	A
	3	453	113	13	1088	0.416	453	421	0.0	0.0	5.618	A
2	1	275	69	255	835	0.329	273	223	0.0	0.5	6.387	A
	2	330	82	183	927	0.356	328	345	0.0	0.5	5.987	A
	3	421	105	58	1198	0.351	421	453	0.0	0.0	4.607	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	22	6	509	726	0.031	22	50	0.0	0.0	5.115	A
	2	509	127	13	933	0.545	507	518	0.8	1.2	8.433	A
	3	544	136	15	1087	0.500	544	505	0.0	0.0	6.535	A
2	1	328	82	306	804	0.408	327	268	0.5	0.7	7.547	A
	2	394	98	220	905	0.435	393	414	0.5	0.8	7.023	A
	3	505	126	69	1190	0.424	505	544	0.0	0.0	5.211	A

17:15 - 17:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	622	655	0.042	27	61	0.0	0.0	5.737	A
	2	623	156	15	931	0.669	620	634	1.2	2.0	11.456	B
	3	665	166	19	1084	0.613	665	617	0.0	0.0	8.337	A
2	1	402	100	374	762	0.527	400	327	0.7	1.1	9.900	A
	2	482	121	269	875	0.551	480	506	0.8	1.2	9.079	A
	3	617	154	84	1179	0.523	617	665	0.0	0.0	6.308	A

17:30 - 17:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	28	7	624	653	0.042	28	62	0.0	0.0	5.751	A
	2	623	156	15	931	0.669	623	636	2.0	2.0	11.671	B
	3	667	167	19	1084	0.615	667	620	0.0	0.0	8.384	A
2	1	402	100	376	761	0.528	402	328	1.1	1.1	10.014	B
	2	482	121	270	875	0.551	482	508	1.2	1.2	9.173	A
	3	620	155	85	1179	0.526	620	667	0.0	0.0	6.343	A

17:45 - 18:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	22	6	512	724	0.031	23	51	0.0	0.0	5.133	A
	2	509	127	13	933	0.545	512	522	2.0	1.2	8.613	A
	3	547	137	15	1087	0.504	547	509	0.0	0.0	6.581	A
2	1	328	82	309	802	0.409	330	270	1.1	0.7	7.651	A
	2	394	98	221	904	0.436	395	417	1.2	0.8	7.106	A
	3	509	127	70	1189	0.428	509	547	0.0	0.0	5.247	A

18:00 - 18:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1	19	5	428	777	0.024	19	42	0.0	0.0	4.750	A
	2	426	107	11	934	0.456	428	436	1.2	0.9	7.131	A
	3	458	114	13	1088	0.420	458	425	0.0	0.0	5.658	A
2	1	275	69	258	833	0.330	276	225	0.7	0.5	6.471	A
	2	330	82	185	926	0.356	331	349	0.8	0.6	6.059	A
	3	425	106	58	1197	0.355	425	458	0.0	0.0	4.636	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.1.4646 []

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: Green Lane_Chipperfield Road.j9
Path: Z:\Projects\9325ITM Bovingdon F2 (F1a)\Tech\Junction Assessments\Picady\Green Lane - Chipperfield Road
Report generation date: 29/06/2016 11:25:34

Summary of junction performance

	AM						PM					
	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap
Existing - 2016 Survey												
Stream B-ACD	1.1	16.26	0.54	C	5.03	32 % [Stream B-ACD]	0.4	9.89	0.27	A	2.59	99 % [Stream B-ACD]
Stream A-BCD	0.0	5.51	0.02	A			0.0	4.74	0.03	A		
Stream D-ABC	0.1	8.41	0.09	A			0.1	7.11	0.07	A		
Stream C-ABD	0.3	5.14	0.12	A			0.2	6.30	0.14	A		
Existing - 2021 Base + Comm												
Stream B-ACD	1.4	18.95	0.59	C	5.62	22 % [Stream B-ACD]	0.4	10.57	0.29	B	2.67	83 % [Stream B-ACD]
Stream A-BCD	0.0	5.47	0.02	A			0.1	4.64	0.04	A		
Stream D-ABC	0.1	8.72	0.10	A			0.1	7.24	0.07	A		
Stream C-ABD	0.3	5.07	0.14	A			0.3	6.35	0.16	A		
Existing - 2021 With Dev												
Stream B-ACD	2.1	24.65	0.69	C	7.77	10 % [Stream B-ACD]	0.5	11.47	0.34	B	3.22	66 % [Stream B-ACD]
Stream A-BCD	0.0	5.46	0.02	A			0.1	4.61	0.04	A		
Stream D-ABC	0.1	8.83	0.10	A			0.1	7.27	0.07	A		
Stream C-ABD	0.4	5.17	0.17	A			0.4	6.94	0.23	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted Av.s. Res Cap indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	Existing Layout
Location	Chipperfield Raod / Green Lane / High Street / Church Lane
Site number	
Date	15/06/2016
Version	
Status	Existing
Identifier	
Client	Taylor Wimpey
Jobnumber	ITM9325
Enumerator	JDW
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Existing	✓	100.000	100.000

Existing - 2016 Survey, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	5.03	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	32	Stream B-ACD

Arms

Arms

Arm	Name	Description	Arm type
A	Chipperfield Road		Major
B	Green Lane		Minor
C	High Street		Major
D	Church Street		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	7.30			81.0	✓	0.00
C	7.30			84.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.74	97	25
D	One lane	3.48	17	20

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-B	Slope for D-C
1	A-D	621	-	-	-	0.227	0.227	0.227	-	0.227	-	-
1	B-AD	560	0.096	0.243	-	-	-	0.153	0.347	0.153	0.096	0.243
1	B-C	687	0.099	0.251	-	-	-	-	-	-	0.099	0.251
1	C-B	623	0.228	0.228	-	-	-	-	-	-	0.228	0.228
1	D-A	667	-	-	-	0.244	0.096	0.244	-	0.096	-	-
1	D-BC	517	0.141	0.141	0.321	0.224	0.089	0.224	-	0.089	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	244	100.000
B		ONE HOUR	✓	233	100.000
C		ONE HOUR	✓	398	100.000
D		ONE HOUR	✓	38	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	58	180	6
	B	150	0	78	5
	C	346	49	0	3
	D	28	6	4	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.54	16.26	1.1	C	214	321
A-BCD	0.02	5.51	0.0	A	8	12
A-B					53	79
A-C					163	245
D-ABC	0.09	8.41	0.1	A	35	52
C-ABD	0.12	5.14	0.3	A	77	116
C-D					2	4
C-A					286	428

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	175	44	516	0.340	173	0.0	0.5	10.438	B
A-BCD	6	2	661	0.009	6	0.0	0.0	5.499	A
A-B	43	11			43				
A-C	134	34			134				
D-ABC	29	7	518	0.055	28	0.0	0.1	7.344	A
C-ABD	56	14	758	0.074	56	0.0	0.1	5.125	A
C-D	2	0.52			2				
C-A	241	60			241				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	209	52	500	0.419	209	0.5	0.7	12.316	B
A-BCD	8	2	670	0.012	8	0.0	0.0	5.435	A
A-B	52	13			52				
A-C	160	40			160				
D-ABC	34	9	498	0.069	34	0.1	0.1	7.759	A
C-ABD	74	18	786	0.094	73	0.1	0.2	5.053	A
C-D	2	0.61			2				
C-A	282	70			282				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	257	64	478	0.537	255	0.7	1.1	16.032	C
A-BCD	11	3	685	0.016	11	0.0	0.0	5.342	A
A-B	63	16			63				
A-C	195	49			195				
D-ABC	42	10	470	0.089	42	0.1	0.1	8.403	A
C-ABD	101	25	825	0.123	101	0.2	0.3	4.974	A
C-D	3	0.72			3				
C-A	334	83			334				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	257	64	478	0.537	256	1.1	1.1	16.259	C
A-BCD	11	3	684	0.016	11	0.0	0.0	5.346	A
A-B	63	16			63				
A-C	195	49			195				
D-ABC	42	10	470	0.089	42	0.1	0.1	8.413	A
C-ABD	101	25	825	0.123	101	0.3	0.3	4.980	A
C-D	3	0.72			3				
C-A	334	83			334				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	209	52	500	0.419	211	1.1	0.7	12.526	B
A-BCD	8	2	670	0.012	8	0.0	0.0	5.441	A
A-B	52	13			52				
A-C	160	40			160				
D-ABC	34	9	498	0.069	34	0.1	0.1	7.773	A
C-ABD	74	18	786	0.094	74	0.3	0.2	5.062	A
C-D	2	0.61			2				
C-A	282	70			282				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	175	44	516	0.340	176	0.7	0.5	10.619	B
A-BCD	6	2	660	0.009	6	0.0	0.0	5.506	A
A-B	43	11			43				
A-C	134	34			134				
D-ABC	29	7	518	0.055	29	0.1	0.1	7.360	A
C-ABD	57	14	758	0.075	57	0.2	0.1	5.135	A
C-D	2	0.52			2				
C-A	241	60			241				

Existing - 2016 Survey, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	2.59	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	99	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	396	100.000
B		ONE HOUR	✓	121	100.000
C		ONE HOUR	✓	242	100.000
D		ONE HOUR	✓	33	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	100	283	13
	B	53	0	64	4
	C	180	60	0	2
	D	26	6	1	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.27	9.89	0.4	A	111	167
A-BCD	0.03	4.74	0.0	A	21	32
A-B					89	134
A-C					253	379
D-ABC	0.07	7.11	0.1	A	30	45
C-ABD	0.14	6.30	0.2	A	75	112
C-D					2	2
C-A					146	219

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	91	23	537	0.170	90	0.0	0.2	8.043	A
A-BCD	16	4	775	0.020	15	0.0	0.0	4.737	A
A-B	74	18			74				
A-C	209	52			209				
D-ABC	25	6	571	0.044	25	0.0	0.0	6.593	A
C-ABD	57	14	650	0.088	57	0.0	0.1	6.060	A
C-D	1	0.34			1				
C-A	124	31			124				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	109	27	520	0.209	109	0.2	0.3	8.734	A
A-BCD	20	5	807	0.025	20	0.0	0.0	4.576	A
A-B	88	22			88				
A-C	248	62			248				
D-ABC	30	7	559	0.053	30	0.0	0.1	6.801	A
C-ABD	72	18	657	0.110	72	0.1	0.2	6.153	A
C-D	2	0.40			2				
C-A	144	36			144				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	133	33	497	0.268	133	0.3	0.4	9.867	A
A-BCD	28	7	851	0.033	28	0.0	0.0	4.374	A
A-B	106	27			106				
A-C	301	75			301				
D-ABC	36	9	543	0.067	36	0.1	0.1	7.110	A
C-ABD	95	24	667	0.142	94	0.2	0.2	6.292	A
C-D	2	0.47			2				
C-A	170	42			170				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	133	33	497	0.268	133	0.4	0.4	9.889	A
A-BCD	28	7	851	0.033	28	0.0	0.0	4.375	A
A-B	106	27			106				
A-C	301	75			301				
D-ABC	36	9	543	0.067	36	0.1	0.1	7.111	A
C-ABD	95	24	667	0.142	95	0.2	0.2	6.298	A
C-D	2	0.47			2				
C-A	170	42			170				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	109	27	520	0.209	109	0.4	0.3	8.765	A
A-BCD	20	5	807	0.025	21	0.0	0.0	4.578	A
A-B	88	22			88				
A-C	248	62			248				
D-ABC	30	7	559	0.053	30	0.1	0.1	6.807	A
C-ABD	72	18	657	0.110	72	0.2	0.2	6.162	A
C-D	2	0.40			2				
C-A	144	36			144				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	91	23	537	0.170	91	0.3	0.2	8.085	A
A-BCD	16	4	775	0.020	16	0.0	0.0	4.740	A
A-B	74	18			74				
A-C	209	52			209				
D-ABC	25	6	570	0.044	25	0.1	0.0	6.599	A
C-ABD	57	14	651	0.088	58	0.2	0.1	6.073	A
C-D	1	0.34			1				
C-A	123	31			123				

Existing - 2021 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	5.62	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	22	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	268	100.000
B		ONE HOUR	✓	250	100.000
C		ONE HOUR	✓	443	100.000
D		ONE HOUR	✓	40	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	62	200	6
	B	161	0	84	5
	C	386	53	0	4
	D	30	6	4	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.59	18.95	1.4	C	229	344
A-BCD	0.02	5.47	0.0	A	9	13
A-B					56	84
A-C					181	272
D-ABC	0.10	8.72	0.1	A	37	55
C-ABD	0.14	5.07	0.3	A	89	134
C-D					3	5
C-A					314	471

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	188	47	508	0.371	186	0.0	0.6	11.109	B
A-BCD	6	2	665	0.010	6	0.0	0.0	5.461	A
A-B	46	12			46				
A-C	149	37			149				
D-ABC	30	8	510	0.059	30	0.0	0.1	7.487	A
C-ABD	64	16	776	0.083	64	0.0	0.2	5.055	A
C-D	3	0.69			3				
C-A	267	67			267				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	225	56	490	0.459	224	0.6	0.8	13.478	B
A-BCD	8	2	676	0.012	8	0.0	0.0	5.389	A
A-B	55	14			55				
A-C	178	44			178				
D-ABC	36	9	488	0.074	36	0.1	0.1	7.961	A
C-ABD	85	21	807	0.105	84	0.2	0.2	4.984	A
C-D	3	0.80			3				
C-A	310	78			310				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	275	69	465	0.592	273	0.8	1.4	18.548	C
A-BCD	11	3	693	0.016	11	0.0	0.0	5.283	A
A-B	67	17			67				
A-C	217	54			217				
D-ABC	44	11	457	0.096	44	0.1	0.1	8.710	A
C-ABD	118	30	852	0.139	118	0.2	0.3	4.909	A
C-D	4	0.95			4				
C-A	366	91			366				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	275	69	465	0.592	275	1.4	1.4	18.951	C
A-BCD	11	3	692	0.016	11	0.0	0.0	5.287	A
A-B	67	17			67				
A-C	217	54			217				
D-ABC	44	11	457	0.096	44	0.1	0.1	8.722	A
C-ABD	118	30	852	0.139	118	0.3	0.3	4.915	A
C-D	4	0.95			4				
C-A	366	91			366				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	225	56	490	0.459	227	1.4	0.9	13.815	B
A-BCD	8	2	676	0.012	8	0.0	0.0	5.393	A
A-B	55	14			55				
A-C	178	44			178				
D-ABC	36	9	487	0.074	36	0.1	0.1	7.978	A
C-ABD	85	21	808	0.105	85	0.3	0.2	4.992	A
C-D	3	0.80			3				
C-A	310	78			310				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	188	47	508	0.371	189	0.9	0.6	11.351	B
A-BCD	6	2	665	0.010	6	0.0	0.0	5.468	A
A-B	46	12			46				
A-C	149	37			149				
D-ABC	30	8	510	0.059	30	0.1	0.1	7.508	A
C-ABD	65	16	776	0.083	65	0.2	0.2	5.066	A
C-D	3	0.69			3				
C-A	266	67			266				

Existing - 2021 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	2.67	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	83	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	439	100.000
B		ONE HOUR	✓	129	100.000
C		ONE HOUR	✓	269	100.000
D		ONE HOUR	✓	35	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	107	318	14
	B	57	0	68	4
	C	202	65	0	2
	D	28	6	1	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.29	10.57	0.4	B	118	178
A-BCD	0.04	4.64	0.1	A	25	37
A-B					95	143
A-C					283	424
D-ABC	0.07	7.24	0.1	A	32	48
C-ABD	0.16	6.35	0.3	A	84	126
C-D					2	2
C-A					161	242

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	97	24	527	0.184	96	0.0	0.2	8.338	A
A-BCD	18	4	793	0.022	18	0.0	0.0	4.641	A
A-B	79	20			79				
A-C	234	59			234				
D-ABC	26	7	567	0.046	26	0.0	0.0	6.656	A
C-ABD	64	16	655	0.098	63	0.0	0.1	6.078	A
C-D	1	0.34			1				
C-A	137	34			137				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	116	29	509	0.228	116	0.2	0.3	9.157	A
A-BCD	23	6	828	0.028	23	0.0	0.0	4.471	A
A-B	93	23			93				
A-C	278	69			278				
D-ABC	31	8	554	0.057	31	0.0	0.1	6.888	A
C-ABD	81	20	663	0.122	81	0.1	0.2	6.184	A
C-D	2	0.39			2				
C-A	159	40			159				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	142	36	483	0.294	142	0.3	0.4	10.541	B
A-BCD	33	8	878	0.038	33	0.0	0.1	4.258	A
A-B	113	28			113				
A-C	337	84			337				
D-ABC	39	10	536	0.072	38	0.1	0.1	7.235	A
C-ABD	108	27	675	0.159	107	0.2	0.3	6.347	A
C-D	2	0.46			2				
C-A	187	47			187				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	142	36	483	0.294	142	0.4	0.4	10.572	B
A-BCD	33	8	878	0.038	33	0.1	0.1	4.259	A
A-B	113	28			113				
A-C	337	84			337				
D-ABC	39	10	536	0.072	39	0.1	0.1	7.237	A
C-ABD	108	27	675	0.159	108	0.3	0.3	6.351	A
C-D	2	0.46			2				
C-A	187	47			187				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	116	29	508	0.228	116	0.4	0.3	9.196	A
A-BCD	23	6	828	0.028	24	0.1	0.0	4.474	A
A-B	93	23			93				
A-C	278	69			278				
D-ABC	31	8	554	0.057	32	0.1	0.1	6.894	A
C-ABD	81	20	663	0.122	81	0.3	0.2	6.195	A
C-D	2	0.39			2				
C-A	159	40			159				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	97	24	527	0.184	97	0.3	0.2	8.385	A
A-BCD	18	4	793	0.022	18	0.0	0.0	4.642	A
A-B	79	20			79				
A-C	234	59			234				
D-ABC	26	7	567	0.046	26	0.1	0.0	6.662	A
C-ABD	64	16	655	0.098	64	0.2	0.1	6.096	A
C-D	1	0.34			1				
C-A	137	34			137				

Existing - 2021 With Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	7.77	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	10	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	275	100.000
B		ONE HOUR	✓	294	100.000
C		ONE HOUR	✓	454	100.000
D		ONE HOUR	✓	40	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	69	200	6
	B	177	0	112	5
	C	386	64	0	4
	D	30	6	4	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.69	24.65	2.1	C	270	405
A-BCD	0.02	5.46	0.0	A	9	13
A-B					62	94
A-C					181	272
D-ABC	0.10	8.83	0.1	A	37	55
C-ABD	0.17	5.17	0.4	A	108	162
C-D					3	5
C-A					306	459

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	221	55	512	0.432	218	0.0	0.7	12.128	B
A-BCD	6	2	667	0.010	6	0.0	0.0	5.451	A
A-B	51	13			51				
A-C	149	37			149				
D-ABC	30	8	507	0.059	30	0.0	0.1	7.538	A
C-ABD	78	19	775	0.100	77	0.0	0.2	5.157	A
C-D	3	0.68			3				
C-A	261	65			261				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	264	66	494	0.535	263	0.7	1.1	15.462	C
A-BCD	8	2	678	0.012	8	0.0	0.0	5.376	A
A-B	61	15			61				
A-C	178	44			178				
D-ABC	36	9	484	0.074	36	0.1	0.1	8.031	A
C-ABD	102	26	806	0.127	102	0.2	0.2	5.115	A
C-D	3	0.78			3				
C-A	303	76			303				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	324	81	469	0.691	320	1.1	2.1	23.582	C
A-BCD	12	3	695	0.017	12	0.0	0.0	5.267	A
A-B	75	19			75				
A-C	217	54			217				
D-ABC	44	11	452	0.097	44	0.1	0.1	8.816	A
C-ABD	143	36	851	0.168	142	0.2	0.4	5.090	A
C-D	4	0.92			4				
C-A	353	88			353				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	324	81	469	0.691	323	2.1	2.1	24.652	C
A-BCD	12	3	694	0.017	12	0.0	0.0	5.271	A
A-B	75	19			75				
A-C	217	54			217				
D-ABC	44	11	452	0.098	44	0.1	0.1	8.833	A
C-ABD	143	36	851	0.168	143	0.4	0.4	5.098	A
C-D	4	0.91			4				
C-A	353	88			353				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	264	66	494	0.535	268	2.1	1.2	16.195	C
A-BCD	8	2	677	0.012	8	0.0	0.0	5.385	A
A-B	61	15			61				
A-C	178	44			178				
D-ABC	36	9	483	0.074	36	0.1	0.1	8.055	A
C-ABD	102	26	806	0.127	103	0.4	0.3	5.127	A
C-D	3	0.78			3				
C-A	303	76			303				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	221	55	512	0.432	223	1.2	0.8	12.524	B
A-BCD	7	2	666	0.010	7	0.0	0.0	5.457	A
A-B	51	13			51				
A-C	149	37			149				
D-ABC	30	8	506	0.059	30	0.1	0.1	7.559	A
C-ABD	78	19	775	0.101	78	0.3	0.2	5.173	A
C-D	3	0.68			3				
C-A	261	65			261				

Existing - 2021 With Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Chipperfield Road / Green Lane	Right-Left Stagger	Two-way	3.22	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	66	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	451	100.000
B		ONE HOUR	✓	150	100.000
C		ONE HOUR	✓	296	100.000
D		ONE HOUR	✓	35	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	119	318	14
	B	63	0	83	4
	C	202	92	0	2
	D	28	6	1	0

Vehicle Mix

HV %s

		To			
		A	B	C	D
From	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.34	11.47	0.5	B	138	206
A-BCD	0.04	4.61	0.1	A	25	38
A-B					106	159
A-C					283	424
D-ABC	0.07	7.27	0.1	A	32	48
C-ABD	0.23	6.94	0.4	A	119	179
C-D					1	2
C-A					151	226

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	113	28	526	0.215	112	0.0	0.3	8.665	A
A-BCD	18	4	799	0.022	18	0.0	0.0	4.611	A
A-B	88	22			88				
A-C	234	59			234				
D-ABC	26	7	565	0.047	26	0.0	0.0	6.675	A
C-ABD	91	23	653	0.139	90	0.0	0.2	6.381	A
C-D	1	0.32			1				
C-A	131	33			131				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	135	34	507	0.266	134	0.3	0.4	9.668	A
A-BCD	24	6	835	0.029	24	0.0	0.0	4.438	A
A-B	104	26			104				
A-C	278	69			278				
D-ABC	31	8	552	0.057	31	0.0	0.1	6.913	A
C-ABD	115	29	661	0.174	114	0.2	0.3	6.587	A
C-D	1	0.37			1				
C-A	150	37			150				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	165	41	479	0.345	165	0.4	0.5	11.417	B
A-BCD	34	8	886	0.038	34	0.0	0.1	4.222	A
A-B	126	32			126				
A-C	337	84			337				
D-ABC	39	10	534	0.072	38	0.1	0.1	7.271	A
C-ABD	153	38	672	0.227	152	0.3	0.4	6.924	A
C-D	2	0.42			2				
C-A	172	43			172				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	165	41	479	0.345	165	0.5	0.5	11.466	B
A-BCD	34	8	886	0.038	34	0.1	0.1	4.225	A
A-B	126	32			126				
A-C	337	84			337				
D-ABC	39	10	533	0.072	39	0.1	0.1	7.273	A
C-ABD	153	38	673	0.227	153	0.4	0.4	6.939	A
C-D	2	0.42			2				
C-A	172	43			172				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	135	34	506	0.266	135	0.5	0.4	9.720	A
A-BCD	24	6	835	0.029	24	0.1	0.0	4.441	A
A-B	104	26			104				
A-C	278	69			278				
D-ABC	31	8	552	0.057	32	0.1	0.1	6.920	A
C-ABD	115	29	661	0.174	115	0.4	0.3	6.606	A
C-D	1	0.37			1				
C-A	150	37			150				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-ACD	113	28	526	0.215	113	0.4	0.3	8.732	A
A-BCD	18	4	798	0.023	18	0.0	0.0	4.614	A
A-B	88	22			88				
A-C	234	58			234				
D-ABC	26	7	565	0.047	26	0.1	0.0	6.684	A
C-ABD	91	23	654	0.139	91	0.3	0.2	6.406	A
C-D	1	0.32			1				
C-A	131	33			131				

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.1.4646 []

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Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: Green Lane_Homefield.j9
Path: Z:\Projects\9325ITM Bovingdon F2 (F1a)\Tech\Junction Assessments\Picady\Green Lane - Homefield
Report generation date: 06/07/2016 08:47:52

Summary of junction performance

	AM						PM					
	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap	Q (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Res Cap
	Existing Layout - 2016 Survey											
Stream B-AC	0.0	0.00	0.00	A	0.02	625 %	0.0	0.00	0.00	A	0.02	900 %
Stream C-AB	0.0	4.83	0.00	A		[Stream C-AB]	0.0	5.25	0.00	A		[]
	Existing Layout - 2021 Base + Comm											
Stream B-AC	0.0	0.00	0.00	A	0.02	577 %	0.0	0.00	0.00	A	0.02	900 %
Stream C-AB	0.0	4.79	0.00	A		[Stream C-AB]	0.0	5.23	0.00	A		[]
	Existing Layout - 2021 With Dev											
Stream B-AC	0.2	9.33	0.14	A	1.32	222 %	0.1	8.71	0.06	A	0.70	330 %
Stream C-AB	0.0	4.83	0.01	A		[Stream B-AC]	0.0	5.32	0.01	A		[Stream B-AC]

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted Av.s. Res Cap indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	Existing Layout
Location	Green Lane / Homefield
Site number	
Date	17/06/2016
Version	
Status	Existing
Identifier	
Client	Taylor Wimpy
Jobnumber	ITM9325
Enumerator	JDW
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Existing Layout	✓	100.000	100.000

Existing Layout - 2016 Survey, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	0.02	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	625	Stream C-AB

Arms

Arms

Arm	Name	Description	Arm type
A	Green Lane (North)		Major
B	Homefield		Minor
C	Green Lane (South)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			150.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.95	15	16

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	488	0.089	0.225	0.141	0.321
1	B-C	631	0.097	0.245	-	-
1	C-B	661	0.256	0.256	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2016 Survey	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	107	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	220	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	103
	B	1	0	3
	C	219	1	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.00	4.83	0.0	A	1	2
C-A					201	301
A-B					4	6
A-C					95	142

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	517	0.000	0	0.0	0.0	0.000	A
C-AB	0.97	0.24	746	0.001	0.96	0.0	0.0	4.828	A
C-A	165	41			165				
A-B	3	0.75			3				
A-C	78	19			78				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	510	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.30	763	0.002	1	0.0	0.0	4.722	A
C-A	197	49			197				
A-B	4	0.90			4				
A-C	93	23			93				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	501	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.40	787	0.002	2	0.0	0.0	4.581	A
C-A	241	60			241				
A-B	4	1			4				
A-C	113	28			113				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	501	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.40	787	0.002	2	0.0	0.0	4.583	A
C-A	241	60			241				
A-B	4	1			4				
A-C	113	28			113				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	510	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.30	763	0.002	1	0.0	0.0	4.722	A
C-A	197	49			197				
A-B	4	0.90			4				
A-C	93	23			93				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	517	0.000	0	0.0	0.0	0.000	A
C-AB	0.97	0.24	746	0.001	0.97	0.0	0.0	4.828	A
C-A	165	41			165				
A-B	3	0.75			3				
A-C	78	19			78				

Existing Layout - 2016 Survey, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	0.02	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2016 Survey	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	159	100.000
B		ONE HOUR	✓	1	100.000
C		ONE HOUR	✓	117	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	157
	B	0	0	1
	C	116	1	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.00	5.25	0.0	A	1	2
C-A					106	159
A-B					2	3
A-C					144	216

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	514	0.000	0	0.0	0.0	0.000	A
C-AB	0.86	0.22	687	0.001	0.86	0.0	0.0	5.246	A
C-A	87	22			87				
A-B	2	0.38			2				
A-C	118	30			118				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	507	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.26	692	0.002	1	0.0	0.0	5.207	A
C-A	104	26			104				
A-B	2	0.45			2				
A-C	141	35			141				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	497	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.34	700	0.002	1	0.0	0.0	5.152	A
C-A	127	32			127				
A-B	2	0.55			2				
A-C	173	43			173				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	497	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.34	700	0.002	1	0.0	0.0	5.154	A
C-A	127	32			127				
A-B	2	0.55			2				
A-C	173	43			173				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	507	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.26	692	0.002	1	0.0	0.0	5.209	A
C-A	104	26			104				
A-B	2	0.45			2				
A-C	141	35			141				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	514	0.000	0	0.0	0.0	0.000	A
C-AB	0.86	0.22	687	0.001	0.86	0.0	0.0	5.246	A
C-A	87	22			87				
A-B	2	0.38			2				
A-C	118	30			118				

Existing Layout - 2021 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	0.02	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	577	Stream C-AB

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2021 Base + Comm	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	114	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	236	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	4	110
	B	1	0	3
	C	235	1	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.00	4.79	0.0	A	1	2
C-A					215	323
A-B					4	6
A-C					101	151

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	514	0.000	0	0.0	0.0	0.000	A
C-AB	0.98	0.25	753	0.001	0.98	0.0	0.0	4.786	A
C-A	177	44			177				
A-B	3	0.75			3				
A-C	83	21			83				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	507	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.31	771	0.002	1	0.0	0.0	4.674	A
C-A	211	53			211				
A-B	4	0.90			4				
A-C	99	25			99				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	497	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.41	797	0.002	2	0.0	0.0	4.525	A
C-A	258	65			258				
A-B	4	1			4				
A-C	121	30			121				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	497	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.41	797	0.002	2	0.0	0.0	4.527	A
C-A	258	65			258				
A-B	4	1			4				
A-C	121	30			121				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	507	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.31	771	0.002	1	0.0	0.0	4.675	A
C-A	211	53			211				
A-B	4	0.90			4				
A-C	99	25			99				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	514	0.000	0	0.0	0.0	0.000	A
C-AB	0.99	0.25	753	0.001	0.99	0.0	0.0	4.786	A
C-A	177	44			177				
A-B	3	0.75			3				
A-C	83	21			83				

Existing Layout - 2021 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	0.02	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2021 Base + Comm	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	170	100.000
B		ONE HOUR	✓	1	100.000
C		ONE HOUR	✓	125	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	168
	B	0	0	1
	C	124	1	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.00	5.23	0.0	A	1	2
C-A					114	170
A-B					2	3
A-C					154	231

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	512	0.000	0	0.0	0.0	0.000	A
C-AB	0.87	0.22	689	0.001	0.87	0.0	0.0	5.232	A
C-A	93	23			93				
A-B	2	0.38			2				
A-C	126	32			126				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	504	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.27	695	0.002	1	0.0	0.0	5.189	A
C-A	111	28			111				
A-B	2	0.45			2				
A-C	151	38			151				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	494	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.34	703	0.002	1	0.0	0.0	5.130	A
C-A	136	34			136				
A-B	2	0.55			2				
A-C	185	46			185				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	494	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.34	703	0.002	1	0.0	0.0	5.132	A
C-A	136	34			136				
A-B	2	0.55			2				
A-C	185	46			185				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	504	0.000	0	0.0	0.0	0.000	A
C-AB	1	0.27	695	0.002	1	0.0	0.0	5.189	A
C-A	111	28			111				
A-B	2	0.45			2				
A-C	151	38			151				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	0	0	512	0.000	0	0.0	0.0	0.000	A
C-AB	0.87	0.22	689	0.001	0.87	0.0	0.0	5.232	A
C-A	93	23			93				
A-B	2	0.38			2				
A-C	126	32			126				

Existing Layout - 2021 With Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	1.32	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	222	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2021 With Dev	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	132	100.000
B		ONE HOUR	✓	57	100.000
C		ONE HOUR	✓	240	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	22	110
	B	45	0	12
	C	235	5	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.14	9.33	0.2	A	52	78
C-AB	0.01	4.83	0.0	A	6	10
C-A					214	321
A-B					20	30
A-C					101	151

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	43	11	469	0.092	43	0.0	0.1	8.433	A
C-AB	5	1	750	0.007	5	0.0	0.0	4.832	A
C-A	176	44			176				
A-B	17	4			17				
A-C	83	21			83				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	51	13	460	0.111	51	0.1	0.1	8.793	A
C-AB	6	2	768	0.008	6	0.0	0.0	4.727	A
C-A	210	52			210				
A-B	20	5			20				
A-C	99	25			99				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	63	16	449	0.140	63	0.1	0.2	9.319	A
C-AB	8	2	793	0.010	8	0.0	0.0	4.588	A
C-A	256	64			256				
A-B	24	6			24				
A-C	121	30			121				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	63	16	449	0.140	63	0.2	0.2	9.329	A
C-AB	8	2	793	0.010	8	0.0	0.0	4.588	A
C-A	256	64			256				
A-B	24	6			24				
A-C	121	30			121				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	51	13	460	0.111	51	0.2	0.1	8.802	A
C-AB	6	2	768	0.008	6	0.0	0.0	4.729	A
C-A	210	52			210				
A-B	20	5			20				
A-C	99	25			99				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	43	11	469	0.092	43	0.1	0.1	8.454	A
C-AB	5	1	750	0.007	5	0.0	0.0	4.832	A
C-A	176	44			176				
A-B	17	4			17				
A-C	83	21			83				

Existing Layout - 2021 With Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Green Lane / Homefield	T-Junction	Two-way	0.70	A

Junction Network Options

Driving side	Lighting	Res Cap (%)	First arm reaching threshold
Left	Normal/unknown	330	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2021 With Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	209	100.000
B		ONE HOUR	✓	25	100.000
C		ONE HOUR	✓	130	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	41	168
	B	21	0	4
	C	124	6	0

Vehicle Mix

HV %s

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.06	8.71	0.1	A	23	34
C-AB	0.01	5.32	0.0	A	7	10
C-A					113	169
A-B					38	56
A-C					154	231

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	19	5	462	0.041	19	0.0	0.0	8.126	A
C-AB	5	1	682	0.008	5	0.0	0.0	5.321	A
C-A	93	23			93				
A-B	31	8			31				
A-C	126	32			126				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	22	6	453	0.050	22	0.0	0.1	8.366	A
C-AB	6	2	686	0.009	6	0.0	0.0	5.295	A
C-A	110	28			110				
A-B	37	9			37				
A-C	151	38			151				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	28	7	441	0.062	27	0.1	0.1	8.712	A
C-AB	8	2	693	0.012	8	0.0	0.0	5.258	A
C-A	135	34			135				
A-B	45	11			45				
A-C	185	46			185				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	28	7	441	0.062	28	0.1	0.1	8.714	A
C-AB	8	2	693	0.012	8	0.0	0.0	5.258	A
C-A	135	34			135				
A-B	45	11			45				
A-C	185	46			185				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	22	6	453	0.050	23	0.1	0.1	8.370	A
C-AB	6	2	686	0.009	6	0.0	0.0	5.297	A
C-A	110	28			110				
A-B	37	9			37				
A-C	151	38			151				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-AC	19	5	462	0.041	19	0.1	0.0	8.134	A
C-AB	5	1	682	0.008	5	0.0	0.0	5.323	A
C-A	93	23			93				
A-B	31	8			31				
A-C	126	32			126				

E enquiries@i-transport.co.uk
W www.i-transport.co.uk

Grove House, Lutyens Close
Chineham Court, Basingstoke
Hampshire RG24 8AG
T 01256 338 640
F 01256 338 644

Centurion House
129 Deansgate
Manchester M3 3WR
T 0161 830 2172
F 0161 830 2173

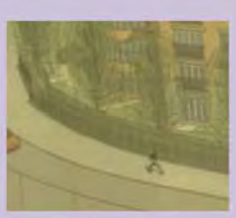
4 Lombard Street
London
EC3V 9HD
T 020 7190 2820
F 020 7190 2821

Park House
Park Square West
Leeds LS1 2PW
T 0113 357 1360
F 0113 357 1361







CSa
environmental planning

Date: March 2015

Land at Homefield,
Bovingdon

Landscape and Visual Appraisal and Green Belt Review

Prepared by
CSa Environmental Planning

On behalf of
Taylor Wimpey UK Ltd

Report No: CSa/2614/01

Date: March 2015

Land at Homefield,
Bovingdon

Landscape and Visual Appraisal and Green Belt Review

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Certificate Number 6523
ISO 9001

Remarks	Date	Prepared by	Authorised by	File Ref
	23.03.15	RC	CA	2614/01

Report No: CSa/2614/01

CONTENTS

Appendices

1.0 INTRODUCTION

Background

1.1 CSa Environmental Planning has been instructed by Taylor Wimpey UK Ltd to provide a landscape and visual appraisal of land at Homefield, Bovingdon, Hertfordshire. The Site is being promoted for residential development through Dacorum Borough Council's ('DBC') Call for Sites which will inform the preparation of the new Local Plan.

1.2 The Site lies within the Green Belt Policy in the DBC adopted Core Strategy. It is identified in the Bovingdon Spatial Strategy as part of a wider option (option 4) which has potential for future development.

1.3 This appraisal describes the existing landscape character and quality of the Site and its visual characteristics. The report then goes on to discuss the ability of the Site to accommodate development and any potential landscape or visual impacts on the wider area. It also considers whether the Site is suitable for release from the Green Belt with regard to the objectives set out in the National Planning Policy Framework ('NPPF').

1.4 In addition, this document a landscape overview of the land at the periphery of the settlement and considers its capacity to accommodate residential development in landscape and Green Belt terms. The findings of this overview are set out in the tables at **Appendix I** and summarised in Section 6 of this document.

Methodology

1.5 This appraisal is based on a Site visit undertaken by a suitably qualified and experienced Landscape Architect in March 2015. Weather conditions at the time of the appraisal were overcast and visibility was moderate to good.

1.6 In landscape and visual impact appraisals, a distinction is drawn between landscape effects (i.e. effects on the character or quality of the landscape irrespective of whether there are any views of the landscape, or viewers to see them) and visual effects (i.e. effects on people's views of the landscape, principally from any residential properties, but also from public rights of way and other areas with general public access). This report therefore considers the potential impact of development on both landscape character and visibility. The methodology utilised in this appraisal is contained in **Appendix K** at the rear of this document.

1.7 Photographs contained within this document (**Appendix C**) were taken using a digital camera with a lens focal length approximating to 50mm, to give a similar depth of vision to the human eye. In some instances images have been combined to create a panorama.

2.0 SITE CONTEXT

Site Context

2.1 The Site occupies a square parcel of land which is currently used as a paddock. The northern Site boundary abuts dwellings at Austin Mead and Yew Tree Drive; the eastern boundary abuts the Hertfordshire Long Distance Footpath and pastoral fields; the southern boundary adjoining fields of rough grassland; and the eastern boundary is defined by the dwellings at Green Lane and Homefield. The location of the Site is shown on the location plan and aerial photograph in **Appendices A and B**.

2.2 The Site contains an area of scrub, located centrally within the paddock. The remainder of the field has been left to pasture with all significant landscape features located at the Site periphery providing the Site with strong sense of containment from the wider countryside.

2.3 Bovingdon is a village located approximately 5 km south west of Hemel Hempstead and approximately 4.5 km south east of Berkhamsted. The village is also located relatively close to Junction 20 of the M25, which is approximately 6 km south east of the village.

2.4 Distinctive features of the village include Bovingdon Airfield, now disused, which currently provides a venue for markets, track days and tv / film production. In addition to the airfield, situated at the northern extent of the village, is Her Majesty's Prison ('HMP'), The Mount. Bovingdon also has a brick works which is located south west of the village at Leyhill Road and been producing bricks for over 100 years.

2.5 Bovingdon is a large village with the historic core of the settlement located around the High Street and the Church of St. Lawerence. Bovingdon Conservation Area is also located in this area and is shown on the plan at **Appendix D**.

2.6 The majority of the residential development at Bovingdon is located to the south of the High Street and occurred post 1960. Development at Austins Mead dates from around this time, however development at Yew Tree Close was built later than this, post 1980.

National Landscape Character

2.7 The Character Map of England' (a national appraisal of landscape character by the Countryside Agency (now Natural England)) identifies the Site as lying within the Chilterns character area (Area 110).

2.8 The Character Map describes the Chilterns as a mixture of arable, grassland and woodland and the numerous commons reflect the dominance of poor agricultural land. Ancient Woodland has remained on areas extensive clay-

with-flint deposits. There are, however, not inconsiderable areas of good quality agricultural land that are associated with the lower lying areas and river valleys.

2.9 The Profile notes that The Chilterns are one of the most wooded lowland landscapes in England and the area is particularly renowned for its extensive native beechwoods, several of which are designated.

2.10 The Profile describes the area as containing nucleated settlements of medieval origin and land farmed since prehistory is found alongside watercourses and springs in the through-valleys and at the foot of the scarp. Elsewhere, dispersed farmsteads dating from the medieval period and mid-19th Century development around commons are characteristic of the plateau.

2.11 There are extensive rights of way, commons, open access downland, woodland and some parkland which provides access across the countryside. The Thames Path, the Ridgeway and the Grand Union Canal are high Profile recreation routes; locally promoted routes include the Chilterns cycleway. Private leisure uses, including golf courses and horse paddocks are common near urban centres.

County Landscape Character

2.12 Hertfordshire County Council have prepared a landscape character assessment for the County which divides it into a series of landscape typologies and classifies Bovingdon and the Site within the Wooded Plateau Farmlands character type. The character type is described, for the most part, as a settled, early enclosed landscape with frequent Ancient Woodlands, associated with a rolling, in places undulating glacial plateau, dissected by numerous shallow valleys.

District Landscape Character

2.13 A study of the landscape character of Dacorum Borough was commissioned by the Chilterns Conservation Board, Dacorum Borough Council and Hertfordshire County Council from The Landscape Partnership in 2002. The Assessment divides the district into a number of character areas with Bovingdon lying within the Bovingdon and Chipperfield Plateau.

2.14 The Assessment describes the plateau as a large, gently undulating plateau which supports a mixed farming pattern. There are fragmented areas of semi natural woodland cover, together with variable, but generally species diverse hedgerows which filter and frame views of the area. The key characteristics are described as follows:

- Expansive, gently undulating plateau;
- Mixed arable and pasture farmland;

- Isolated and fragmented woodland cover;
- Medium to large fields to the east with remote feel;
- Settlement pattern comprising a number of villages which spread across the plateau in loose organic forms;
- Densely hedged narrow lanes;
- Semi derelict feel to large scale redundant or industrial sites; and
- Few focal points and vistas.

2.15 The distinctive features of the character area are described as:

- Flauden cottages and Gilbert Scott parish Church;
- Bovingdon Brickworks;
- Bovingdon Airfield-Sunday Market and Prison;
- Westbrook Hay House, puddingstone summerhouse and historic parkland;
- Views across Sheethanger Common from Felden;
- Westbrook Hay lodges/estate buildings; and
- Felden water tower.

Statutory and Non-Statutory Designations

2.16 The Multi Agency Geographic Information for the Countryside Map ('MAGIC') indicates that the Site is not covered by any statutory or non-statutory designations for landscape character or quality.

Conservation Area and Listed Buildings

2.17 There are no listed buildings within or adjacent to the Site. The nearest listed building is located in Bovingdon Conservation Area of which the nearest extent is located approximately 100 metres from the north west corner of the Site (**Refer to Appendix D**). There is no-intervisibility between the Site and the Conservation Area.

Public Rights of Way

2.18 The Hertfordshire Long Distance Route runs along the northern part of the eastern boundary. The Long Distance Route heads north west out of Bovingdon. It converges with the Chiltern Long Distance Footpath

approximately 100 metres north of the northern Site boundary. There is a public footpath which runs in an approximately north east, - south west direction, branching from the Hertfordshire Long Distance Route, approximately 130 metres from the eastern boundary. The wider landscape contains a number of further public footpaths and bridleways.

Tree Preservation Orders

2.19 None of the trees within or adjacent to the Site are covered by Tree Preservation Orders ('TPO'). This was confirmed by Dacorum Borough Council, via email on Friday 13th March 2015.

3.0 LANDSCAPE POLICY CONTEXT

National Planning Policy

3.1 The NPPF states that *'the fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence.'*

3.2 Paragraph 80 of the NPPF, sets out the five purposes of the Green Belt, which are as follows:

1. To check the unrestricted sprawl of large built-up areas;
2. To prevent neighbouring towns merging into one another;
3. To assist in safeguarding the countryside from encroachment;
4. To preserve the setting and special character of historic towns; and
5. To assist in urban regeneration, by encouraging the recycling of old derelict and other urban land.

Local Policy Context

3.3 Dacorum Borough Council ('DBC') adopted their Core Strategy on 25th September 2013. The Core Strategy is the first of a suite of documents which will make up the new Local Plan for Dacorum Borough Council and therefore does not replace all the polices contained within the adopted Dacroum Borough Local Plan 1991-2011. A number of these polices have been 'saved' and continue to form part of the Development Plan for Dacorum Borough until they are superseded by emerging planning policy.

3.4 The Site lies outside of the settlement boundary and is located within the Green Belt.

Adopted Core Strategy

3.5 **Policy CS5: The Green Belt** states that the Council will apply national Green Belt policy to protect the openness and the character of the Green Belt, local distinctiveness and the physical separation of settlements. There will be no general review of the Green Belt boundary through the Site Allocations DPD, although local allocations (under Policies CS2 and CS3) will be permitted.

3.6 With the Green Belt, small-scale development will be permitted including;

a) Building for the uses defined as appropriate in national policy;

b) The replacement of existing buildings for the same use;

c) Limited extensions to existing buildings;

d) The appropriate reuse of permanent, substantial buildings; and

e) The redevelopment of previously developed sites, including major developed sites which will be defined on the Proposals Map provided.

3.7 **Policy CS4: Towns and Large Villages** states that development will be guided to the appropriate areas within settlements. In residential areas appropriate residential development is encouraged.

3.8 **Policy CS25: Landscape Character** states that all development will help conserve and enhance Dacorum's natural and historic landscape. Proposals will be assessed for their impact on landscape features to ensure that they conserve or improve the prevailing landscape quality, character and condition and take full account of Dacorum Landscape Character Assessment, Historic Landscape Characterisation and advice contained within the Hertfordshire Historic Environment Record.

3.9 **Policy CS26: Green Infrastructure** states that The Green Infrastructure Network will be protected, extended and enhanced. Habitat management zones, projects and more detailed policies will be set out in Supplementary Planning Document and related Action Plan(s).

3.10 National and local Biodiversity Action Plans will be supported. Designated sites will be protected and opportunities taken to link them with the wider Green Infrastructure Network. Development and management action will contribute towards;

- The conservation and restoration of habitats and species;
- The strengthening of biodiversity corridors;
- The creation of better public access and links through green space; and
- A greater range of uses in urban green spaces.

Bovingdon Place Strategy from the Adopted Core Strategy 2013

3.11 The local objectives for Bovingdon are:

- Provide around 130 new homes between 2006 and 2031;
- Seek to provide a residential care home;
- Provide new open space;
- Safeguard the unique employment uses, such as Bovingdon Brickworks and HMP The Mount; and
- Resolve parking issues along the High Street.

3.12 The Bovingdon Place Strategy identifies one allocation for the village (Proposal LA6) at Chesham Road / Molyneaux Avenue for around 60 new homes and open space.

Core Strategy Supporting Documents

Spatial Strategy for the Village of Bovingdon (June 2009)

3.13 Dacorum Borough Council have prepared a spatial strategy for the village of Bovingdon to support the Core Strategy and the document was used in the consultation period before the adoption of the Core Strategy.

3.14 The spatial strategy identifies four options for growth within Bovingdon as identified on the plan at **Appendix H**, which includes the Site at Homefield as part of option 2.

Green Belt Review Purposes Assessment (November 2013)

3.15 A Green Belt Review has been prepared for Dacorum Borough Council, St Albans City and District Council and Welwyn Hatfield Borough Council by Sinclair Knight Merz ('SKM') in November 2013.

3.16 Paragraph 1.1.2 of the report states that the brief is as follows:

To carry out an independent and comprehensive Green Belt review for the Dacorum, St. Albans and Welwyn Hatfield administrative areas. This should include the definition of sub areas and provision of advice on the role that each sub area plays in fulfilling the fundamental aim of the Green Belt and the five purposes set out in the National Planning Policy Framework ('NPPF'). The study objectives are to:

- *Examine best practice in Green Belt Reviews in order to identify and agree a methodology for the study;*
- *Review the existing Green Belt in the study area, including the aim and purposes and define sub areas for analysis;*
- *Take full account of the wider Metropolitan Green Belt;*
- *Review the role of each of the sub areas (seen as 'strategic parcels') in the context of the NPPF and consider the extent to which each contributes to the fundamental aim of retaining openness and the purposes of including land in the Green Belt;*
- *Rank and score the strategic parcels by how well they contribute to the fundamental aim and purposes of Green Belts;*
- *Consider whether, in the context of the NPPF, other areas of countryside in the study area should be proposed as Green Belt;*

- *Provide advice on the efficacy and consistency of existing local policies applying to the Green Belt in the study area; and*

- *For land within Dacorum Borough, consider whether any further, 'major developed sites' should be identified, in addition to those listed in Table 2 in the Dacorum Core Strategy.*

3.17 The SKM report examines the function of a series of parcels of Green Belt land defined at a strategic level. Each parcel will be assessed against the assessment criteria. The assessment criteria primarily relate to the first four national Green Belt purposes set out in the NPPF. In addition, the SKM report considers the local objectives and the role of the Green Belt within the Hertfordshire context, which the SKM report states, justifies the assessment of a local purpose which relates to maintaining the existing settlement pattern.

3.18 The fifth purpose of the NPPF has been screened out in the SKM report. The SKM report states that by encouraging the recycling of derelict and other urban land is considered to be more complex to assess than the other four purposes stated in the NPPF because the relationship between the Green Belt and recycling of urban land is influenced by a range of external factors including local plan policies, brownfield land and availability of the land / development market.

Parcel GB 13 – Green Belt Land to the South of Bovingdon

3.19 The SKM report includes parcel assessment sheets for each Borough. Annex 1 contains the assessment sheets for Dacorum Borough within which the Site, is identified within Parcel GB13 and as sub parcel D-SS2. The parcel assessment sheet can be found at **Appendix G.**

3.20 Parcel GB13 comprises a broad swathe of land which extends south of Bovingdon as far as the Dacroum district boundary. Sub-parcel D-SS2 is a discrete land parcel, which includes the Site, located at the edge of the settlement.

3.21 In summary the sheet identifies that the wider parcel makes little or no contribution to purposes 1 and 2 of the NPPF Green Belt Purposes; a significant contribution to NPPF purposes 3 and 4; and partial contribution to the local Hertfordshire purpose.

3.22 In terms of the sub-parcel D-SS2 (which include the Site) the assessment states that:

'the land at southeast Bovingdon at Homefield, is recommended for further assessment as a small scale sub-area (D-SS2). Assessed in isolation this land makes limited or no contribution towards checking sprawl, preventing merging or maintaining local gaps. The land makes relatively limited contribution to the primary functions of the Green Belt.'

4.0 SITE DESCRIPTION AND VISIBILITY

Site Description

4.1 The Site occupies a square parcel of land which is currently used as a paddock. The northern Site boundary abuts dwellings at Austin Mead and Yew Tree Drive; the eastern boundary abuts the Hertfordshire Long Distance Footpath and pastoral fields; the southern boundary adjoins fields of rough grassland; and the eastern boundary lies alongside dwellings at Green Lane and Homefield.

4.2 The Site is currently grazed by horses and contains an area of scrub vegetation located centrally within the paddock. The remaining landscape features are contained at the Site boundaries with tall, mature trees, scrub and vegetation located at the peripheries of the Site. The established vegetation to the eastern and southern boundaries, gives the Site a strong sense of enclosure from the wider countryside.

4.3 There are a number of mature trees at the northern and western boundaries where the Site abuts residential dwellings. In these locations the boundary also consists of garden fences and hedges, with less in the way of scrub vegetation than the eastern and southern boundaries.

4.4 There are approximately 9 dwellings at Austin Mead whose gardens back onto the northern Site boundary; and a further 7 dwellings at Yew Tree Drive and at Green Lane and Homefield whose gardens back onto the northern and western Site boundaries respectively.

4.5 There is access into the Site, via field gates from both Yew Tree Drive and Homefield. The Hertfordshire Way Long Distance Footpath runs adjacent to the northern part of the eastern boundary before heading southwards across the adjacent field.

Landscape Quality and Value

4.6 The Site occupies a square parcel of land and adjoins the existing urban area of Bovingdon to the north and west. The land gently falls away to the south and the boundaries of the adjoining fields contain mature trees and hedgerows. The Site is used as a paddock and has an undistinguished urban fringe character. Accordingly, the Site is considered to be of medium to low landscape quality.

4.7 There are no public rights of way which cross the Site, however the Hertfordshire Way Long Distance Footpath ('HWLDF') runs parallel to the northern half of the eastern boundary. Views from this section of the footpath, which is located close to the Site, are heavily influenced by the existing urban area and also by the mature vegetation at the Site and adjoining field boundaries. There are no known heritage assets located within or at close proximity to the Site. The Site is therefore considered to have a medium to low landscape value.

Topography

4.8 The Site is located on a relatively level parcel of land at approximately 155 metres Above Ordnance Datum ('AOD'). The land to the south gently falls away to approximately 149 metres AOD at Faulden Lane and to the north and north east of the Site, beyond the urban area of Bovingdon, the land remains at 155 metres AOD falling away further north to 140 metres AOD. The disused Bovingdon Airfield and HMP The Mount are located on the west side of Bovingdon at approximately 160 metres AOD. The airfield is a large open expanse of land and views of it cannot be seen from the Site.

Visibility

4.9 An appraisal of the visibility of the Site was undertaken and a series of photographs taken from public vantage points, rights of way and public highways. The viewpoints are illustrated on the aerial photograph at **Appendix B** and the photographs contained in **Appendix C**.

4.10 From our appraisal it is apparent that views of the Site are limited to near distance views from the adjoining fields, housing and public right of way by a combination of boundary vegetation and sub-urban development. The key views of the Site are described in the tables contained in **Appendix J** and are summarised below.

Near Distance Views

4.11 There are near distance views from the dwellings at Yew Tree Drive, Austins Mead (**Photograph 15**), Homefield and Green Lane (**Photograph 03**). Dwellings at Green Lane are set within larger plots than those at Austins Mead and Yew Tree Avenue resulting in views being more heavily filtered by rear garden vegetation. Dwellings at Yew Tree Drive and Austins Mead are partially filtered by existing vegetation at the northern Site boundaries but have views from ground and first floor elevations.

4.12 From the southern end of Yew Tree Avenue there are partial views of the Site over the farm access gate. There is a similar situation at Homefield where partial views of the Site are available over the field gate.

4.13 From the Hertfordshire Way Long Distance Footpath ('HWLDF') which runs adjacent to the northern half of the eastern boundary, heavily filtered views of the Site are available through the trees at the eastern boundary (**Photograph 05**). From further along the HWLDF at the southerly extent of the neighbouring field, heavily filtered views of the Site can be seen through the trees and vegetation at the eastern Site boundary vegetation (**Photograph 08**).

4.14 Further along the HWLDF, south of the Site, views of the Site are prevented by intervening vegetation and by the gentle falling of local landform (**Photographs 09 and 10**). From Bovingdon Conservation Area, views of the Site are prevented by the intervening urban area.

Middle and Long Distance Views

4.15 From Chipperfield Road and public footpath, approaching the village from the south east views of the Site are prevented by intervening vegetation and landform (**Photograph 21**).

4.16 North east of the Site at the Chiltern Way Long Distance Footpath ('CWLDF') views of the Site are prevented by the built up area of Bovingdon (**Photographs 17 and 16**).

4.17 In middle distance views from the HWLDF and the public footpath which crosses it views are obscured by intervening vegetation and landform (**Photographs 19, 10 and 11**). Similarly from Flauden Road (**Photograph 20**) views of the Site are screened by existing vegetation and the intervening landform.

5.0 SUITABILITY OF THE SITE TO ACCOMMODATE DEVELOPMENT

5.1 The following section assesses the ability of the Site to accommodate residential development and any potential impacts on the character of the landscape and visual amenity, or on the objectives of the Green Belt policy. The key landscape and visual effects are summarised on the tables in **Appendix J**, and described in the relevant section below.

5.2 The key development and landscape principles, which should be adopted by future development proposals, are summarised below:

- Retention of the existing vegetation at the Site boundaries, in particular those at the eastern and southern peripheries;
- Respect the amenity of the existing properties at Yew Tree Drive, Austins Mead and Homefield where dwellings have partial / open views into the Site;
- Respect the amenity of properties at Green Lane where properties have filtered views into the Site;
- Vehicular access to be provided from Homefield with potential for a secondary vehicular and pedestrian access from Yew Tree Drive;
- Retain vegetation adjacent to the Hertfordshire Way Long Distance Footpath and respect the amenity of this footpath in the layout of the Site;
- Provide pedestrian connections from the Site to the HWLDF;

5.3 In the following section a brief commentary is made on the effects of developing the Site against a series of landscape criteria.

Relationship to Existing Development

5.4 The proposed development area is well related to the existing housing at Bovingdon which extends alongside the northern and western boundaries of the Site. To the south west is additional housing and open space beyond which is an area of playing fields. A short distance south west is a collection of farm buildings which separate the Site from the wider countryside.

Landscape Features

5.5 There are no landscape features contained within the Site which would pose a constraint to development and there are significant opportunities for landscape enhancements at the boundaries of the Site and within areas of new open space.

Public Rights of Way

5.6 There are no public rights of way which cross the Site. The nearest public right of way is the HWLDF which runs adjacent to the northern half of the eastern boundary of the Site, the footpath then crosses the adjacent field diagonally and heads in a south easterly direction. There are opportunities to provide connections from the Site to the footpath whilst also retaining the path along its current route and respecting its setting through the retention of existing vegetation at the Site boundaries.

Visibility

5.7 The visual appraisal set out in Section 4 identifies that views of the Site are limited to near distance views from the adjoining field, housing and HWLDF. The Site is well contained in middle and long distance views by virtue of the local topography and existing vegetation in the landscape.

North

5.8 Dwellings at Yew Tree Drive and Austins Mead are partially filtered by existing vegetation at the northern Site boundary and within the rear gardens of the properties which back onto the Site. These dwellings have relatively short rear gardens and views of development will be available from rear gardens, ground and first floor windows. Future development proposals should adopt appropriate back to back distances and privacy standards in order to respect the visual amenity of these dwellings.

5.9 From the HWLDF north of Bovingdon, views of the Site are prevented by the intervening urban area and landform. Similarly, views from within the Bovingdon Conservation Area are prevented by the intervening vegetation and landform.

East

5.10 Views from the HWLDF adjacent to the Site are heavily filtered by the existing boundary vegetation, and loss of visual amenity will be limited, particularly given its proximity to the existing urban area.

5.11 From the HWLDF at the south easterly corner of the adjacent field, views of the Site will remain heavily filtered through the existing vegetation. From this point onwards, heading in a south easterly direction, views of the Site from the HWLDF are prevented by intervening vegetation at field boundaries and the gentle falling away of the land.

5.12 From the public footpath and from Chipperfield Road to the east, views of the Site are prevented by the vegetation at field boundaries and the local topography.

South

5.13 A public footpath branches from the HWLDF and heads in south westerly direction towards Bovingdon Green, passing an extensive area of nursery glass houses. From this footpath views of the Site are precluded by mature vegetation at field boundaries and by the local topography. From Bovingdon Green, the situation is similar; views of the Site are precluded by intervening vegetation and also by development at Green Lane.

5.14 Middle and long distance views from the public footpaths and roads, south of the Site are prevented by intervening vegetation and landform.

West

5.15 There are a small number of filtered views from the dwellings at Green Lane whose rear gardens back onto the Site. Garden vegetation and trees at the Site boundary filter a number of the available views however, a small number of properties will gain views of development at the Site. Appropriate back to back distances and new landscape planting at the western boundary will help to respect the amenity of these properties.

5.16 Dwellings at Green Lane are set within larger plots than those at Austins Mead and Yew Tree Avenue resulting in views being more heavily filtered by rear garden vegetation, minimising any loss of visual amenity resulting from development at the Site.

5.17 The majority of the built up area of Bovingdon is located to the west of the Site at Green Lane and the B4505. This significant area of development results in views of the Site being unavailable from the west. The disused airfield and HMP The Mount are located on the western and north western extents of the village. Although the airfield is a relatively large, flat and open expanse the intervening built up area of the village and the slight level change across the area result in views of the Site being unavailable from this location. This situation applies to the HMP The Mount also, which is located adjacent to the airfield.

5.18 Beyond the airfield to the west, the land falls away and scattered areas of woodland are a common feature, which prevent views of the Site.

Landscape Character and Quality

5.19 As discussed in the previous section, the Site does not carry any statutory or non-statutory designations for landscape character or quality it is well related to the existing urban area and has a somewhat urban fringe character. The proposals can respect the existing landscape assets of the Site and provide opportunities for landscape enhancements within areas of open space and at the Site boundaries.

5.20 Furthermore, as a result of the Sites proximity to the existing urban area of Bovingdon, and the well vegetated nature of the adjoining landscape, residential development at the Site will have no material impact on the character of the wider landscape. Accordingly, a well-conceived layout in this location will not appear at odds with its suburban setting and the proposals could be accommodated without significantly impacting on the character of the immediate landscape or townscape.

Compliance with Planning Policy and Landscape Guidance

5.21 The proposals lie outside the existing settlement boundary and thus within the countryside. The Site is however, well related to the existing urban area, in a sustainable location and would represent a planned release of land to meet an identified housing need.

5.22 The Site can accommodate appropriate development at the edge of the settlement, in a manner which respects the scale and amenity of the surrounding residential area. It will not impact on the setting of any heritage assets and can retain the majority of the existing landscape features, as well as make provision for new planting. As a result, the proposals will not offend the landscape policies in the Adopted Core Strategy.

Green Belt Policy

5.23 The SKM Green Belt Review highlights that the Site, identified as sub-parcel D-SS2, makes limited or no contribution towards checking sprawl, preventing merging or maintaining local gaps. The land therefore makes a relatively limited contribution to the primary functions of the Green Belt.

5.24 We would concur with these findings for the following reasons:

- The Site is well related to the existing urban area; development would be a planned release of land and would not constitute urban sprawl;
- The Site benefits from robust, defensible boundaries and is contained in views such that new housing development would not encroach on the wider countryside;
- Development would not impact on any known heritage assets; and
- Development would not lead to coalescence.

5.25 In addition, there are limited opportunities for brown field regeneration within the existing settlement area at Bovingdon and therefore a planned release of green field land would not prejudice urban regeneration within the settlement.

6.0 APPRAISAL OF POTENTIAL SITES WITHIN THE GREENBELT AT BOVINGDON

6.1 In addition to the appraisal of the land at Homfield, this document considers the ability of the Green Belt land on the periphery of the village to accommodate residential development and any potential landscape and visual constraints. Dacorum Borough Council's Spatial Strategy for the Village of Bovingdon (June 2009), has identified four options for growth within the village, all of which are located within the Green Belt. A plan identifying the location of each of the areas is contained in **Appendix H**, and they are as follows:

- Option 1: Duckhall Farm
- Option 2: Rear of Green Lane (including the Site)
- Option 3: Grange Farm
- Option 4: North of Chesham Road

6.2 Our appraisal of the four options are summarised in the tables at **Appendix I** and the findings of this appraisal are briefly summarised below.

6.3 The appraisal considers the potential for release of these greenfield parcels against the five functions of the Green Belt as stated in the NPPF, which are as follows:

1) To check the unrestricted sprawl of large built-up areas;
2) To prevent neighbouring towns merging into one another;
3) To assist in safeguarding the countryside from encroachment;
4) To preserve the setting and special character of historic towns; and
5) To assist in urban regeneration, by encouraging the recycling of old derelict and other urban land.

6.4 The NPPF states at paragraph 79 and 80, that the essential character of the Green Belts is their openness, their permanence and their ability to serve the functions as set out above. The Framework notes that when defining Green Belt boundaries, local authorities should take account of the need to promote sustainable patterns of development and ensure that there would be sufficient safeguarded land outside the Green Belt in order to meet the long term development needs of the area. It goes on to say that the Green Belt boundaries should be defined clearly along physical features which are readily recognisable and likely to be permanent.

6.5 Dacorum Borough Council commissioned SKM to carry out an assessment of the Green Belt around Bovingdon. The SKM Green Belt Review Purposes Assessment divides the periphery of the village into three broad study areas (GB12, GB13 and GB14A), and assesses how these parcels perform against the five purposes of the NPPF.

6.6 Due to the scale of the assessed parcels, the report makes general comments on their function against the objectives of the Green Belt. In the case of Bovingdon, the report identifies one distinct sub parcel for further consideration. It notes that the sub parcel, D-SS2, which includes the land south of Green Lane as making little contribution to the Green Belt objectives.

6.7 Option 1, is located on the north west periphery of the village and occupies an area of rough grassland dissected by multiple hedgerows and trees which would pose constraint to development at this location. The two most southerly fields of this option are bounded by the existing urban area at Bovingdon, with Duck Hall Farm and Honours Farm, both listed buildings, indented into the southern end. The more northerly stretch of this land, however, would extend the existing urban envelope, encroaching on the wider countryside and would erode the gap between Bovingdon and a small collection of dwellings further along the Hempstead Road.

6.8 Option 2, is located to the rear of Green Lane, Yew Tree Drive and Austins Mead and is well related to the existing urban area of Bovingdon. The option comprises roughly three fields and part of an adjoining field, which contain mature, well vegetated boundaries. This area is well contained in views from the wider area and development would not encroach particularly on the adjoining countryside. In addition, development in this location would not impact on any known heritage assets; contribute to coalescence; and a planned release of land could be accommodated without resulting in urban sprawl. Accordingly, growth in this direction would not significantly impact on the objectives of the Green Belt.

6.9 Option 3, is located on the south western edge of Bovingdon and comprises of large fields sub-divided by wire fences with some evidence of use as playing fields. This option contains mature vegetation to its eastern boundary with less to the north and west allowing views to the neighbouring disused Bovingdon Airfield. Green Lane runs adjacent to the southern boundary of this option and currently has a relatively rural feel. Development in this location would result in a significant expansion to the south of the village. It would encroach on the adjoining countryside and would be visible in views from the south and the approach to the village along B4505.

6.10 Option 4 is located east and west of Molyneaux Avenue. The parcel east of Molyneaux Avenue is overgrown and birch and scrub have begun to colonise the land. This part of the option is well contained in views and is surrounded by development on all sides except the west, where the disused airfield is located. This area forms part of a local allocation in the Core Strategy and its removal from the Green Belt would do little to compromise the Green Belt objectives. West of Molyneaux Avenue is the disused Bovingdon airfield of which the part closest to the B4505 is included in the option. This is relatively open in views owing to the absence of any significant landscape features. Development here would extend beyond the existing village extents and would impact on open land at the edge of the village.

7.0 CONCLUSION

7.1 The Site is bound by Yew Tree Avenue and Austins Mead to the north; Homefield and Green Lane to the west; rough grassland fields to the south and by the HWLDF and pastoral agricultural land to the east. The Site is being promoted for residential development through Dacorum Borough Council's ('DBC') Call for Sites to inform preparation of the new Local Plan.

7.2 The Site lies within the Green Belt, however it has been identified within a recent Green Belt Review, undertaken by Dacorum Borough Council, to be considered as suitable for further assessment as it *'makes limited or no contribution towards checking sprawl, preventing merging or maintaining local gaps. The land makes relatively limited contribution to the primary functions of the Green Belt.'*

7.3 There are no policies for landscape character or quality covering the Site or the adjoining land and the Site contains no TPO trees. It is relatively undistinguished in landscape character.

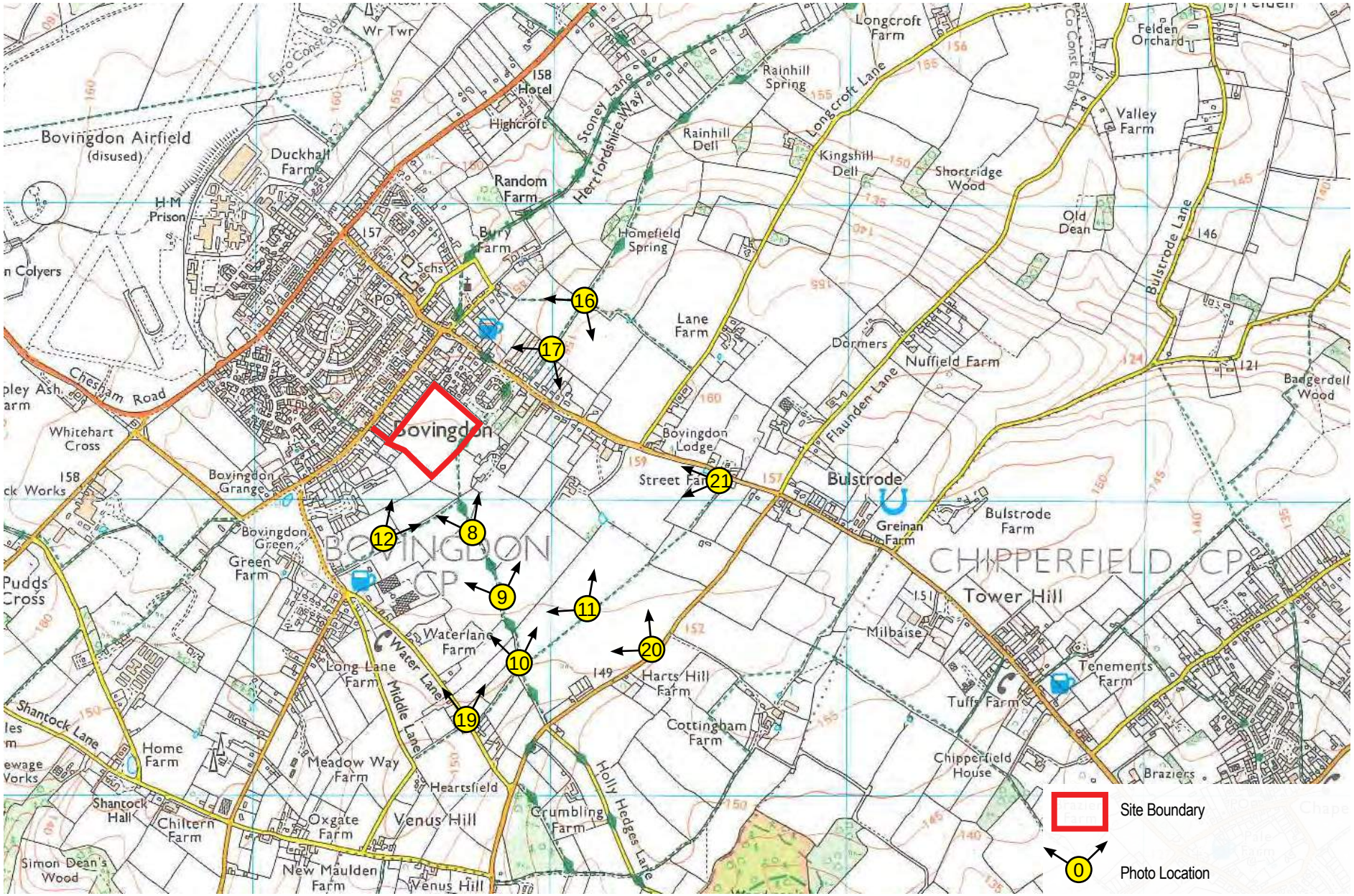
7.4 The Site is well contained in views from the wider countryside due to the mature vegetation at the Site boundaries and the nature of the local topography. It is well related to the existing pattern of development and housing in this location would not encroach significantly on the wider countryside to the south. In addition, our appraisal found that the Site makes little contribution to the first four objectives of the Green Belt as set out in the NPPF.

7.5 This appraisal also considered opportunities for development at the four options as identified in Dacorum Borough Council's Spatial Strategy for the Village of Bovingdon. In this respect, the appraisal found that option 2 and part of option 4 (the allocated site east of Molyneaux Avenue) would provide the most logical release of land from the Green Belt and provide the least impact in landscape terms.

7.6 Our overall conclusion is that, in accordance with a coherent and well thought out layout, the scheme will not result in any significant landscape or visual effects or have a material impact on the character of the local landscape or existing settlement and is suitable for release from the Green Belt.

Appendix A

Location Plan
CSa/2614/101



CSa environmental planning
Dixies Barns,
High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

Project	Homefield, Bovingdon	Date	March 2015	Drawing Number	CSa/2614/101
Title	Location Plan	Scale	Not to Scale	Revision	-
Client	Taylor Wimpey UK Ltd	Drawn	JC	Checked	RC

Appendix B

Aerial Photograph
CSa/2614/100

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Dixies Barns,
High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Title	Aerial Photograph	Scale	Not to Scale	Revision	-
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Appendix C

Photographs
CSa/2614/103

Northern Site Boundary

Southern Site Boundary

Photograph **01**

Western Site Boundary

Dwellings at Homefield

Dwellings at Yew Tree Drive

Photograph **02**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Photograph **03**

The Hertfordshire Way Long Distance Footpath looking north

Photograph **04**

The Hertfordshire Way Long Distance Footpath looking north

Photograph **05**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Photograph **06**

Photograph **07**

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Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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The Hertfordshire Way Long Distance Footpath

Eastern Site Boundary

Photograph **08**

The Hertfordshire Way Long Distance Footpath

Photograph **09**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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The Hertfordshire Way Long Distance Footpath

Photograph **10**

View from public footpath South of the Site. Photograph **11**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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View from public footpath south west of the Site. Photograph **12**

Photograph **13**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Southern Site Boundary

Eastern Site Boundary

Photograph **14**

Dwellings at Yew Tree Close and Austins Mead

Photograph **15**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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View from The Chiltern Way Long Distance Footpath. Photograph **16**

The Chiltern Way Long Distance Footpath. Photograph 17

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Title	Photosheets	Drawn	ES	Checked	RC
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View of the Site from Homefield. Photograph **18**

View from public footpath South of the Site. Photograph **19**

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High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

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Title	Photosheets			Drawn	ES	Checked RC	Revision -
Client	Taylor Wimpey UK Ltd						

View from Flaunden Lane. Photograph **20**

View from public footpath to the South east. Photograph **21**

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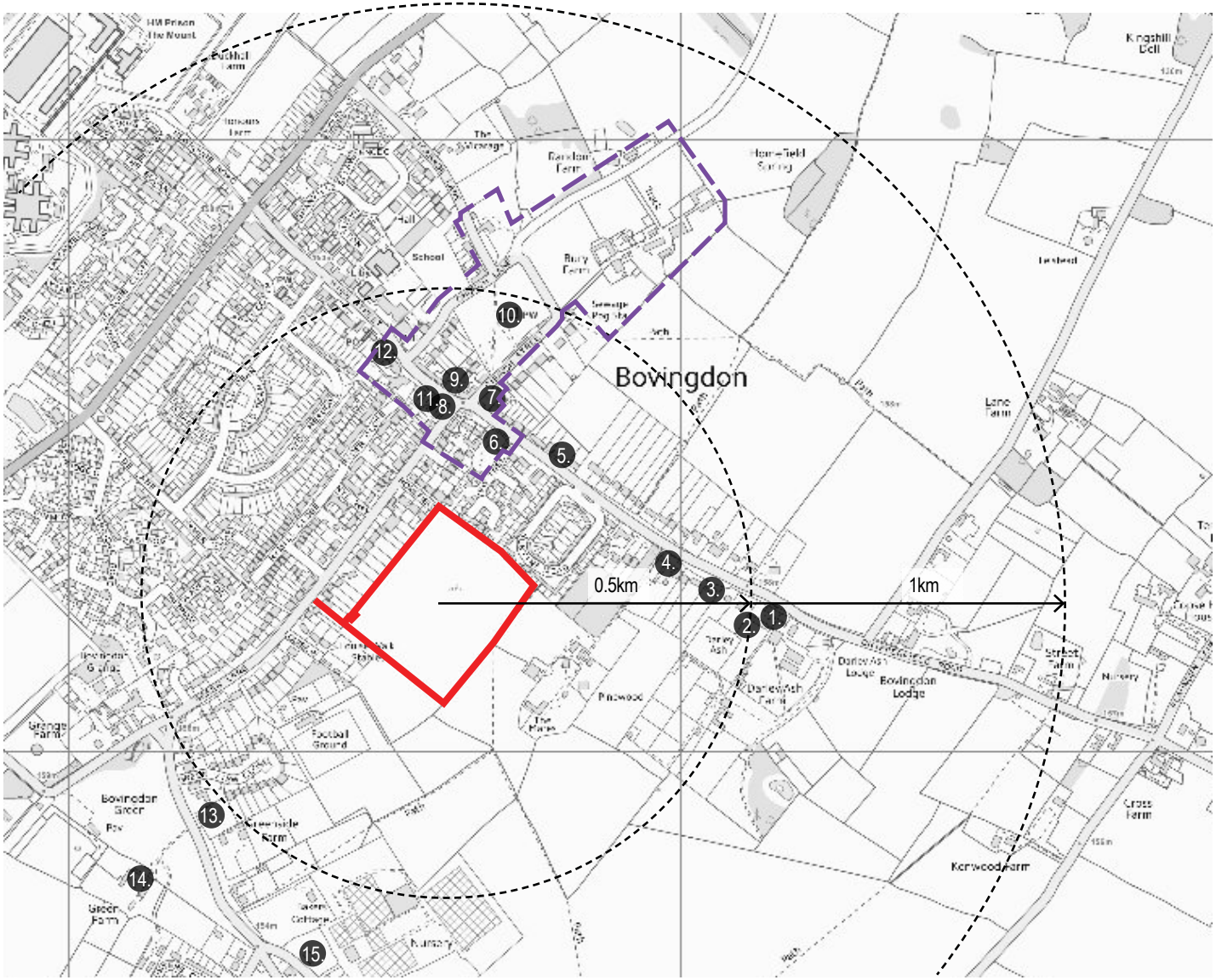
High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

Project	Homefield, Bovingdon			Date	March 2015	Drawing Number	CSa/2614/103
Title	Photosheets			Drawn	ES	Checked RC	Revision -
Client	Taylor Wimpey UK Ltd						

Appendix D

Magic Map Extract
CSa/2614/102



Site Boundary

0.5 & 1km Radius

Approximate Extent of Bovingdon Conservation Area

1. Listed Buildings (England)

1. Entrance Barn at Rent Street Barns, Chipperfield Road Grade II
2. Rent Street Barn, Chipperfield Road, Grade II*
3. The White Cottage, Chipperfield Road, Grade II
4. Ivy Cottage, Lantern Cottage & Primrose Cottage, Chipperfield Road, Grade II
5. Forge Cottage, Chipperfield Road, Grade II
6. Yew Tree Cottage, Chipperfield Road, Grade II
7. Bull Cottage, Chipperfield Road, Grade II
8. 106 & 108 High Street, Grade II
9. The Bell Public House, High Street, Grade II
10. Church of St. Lawrence, Church Street, Grade II*
11. The Wheatsheaf, High Street, Grade II
12. Bovingdon Cottage & Tumbleweed Cottage, Grade II
13. Red Lion Cottage, Green Lane, Grade II
14. Green Farmhouse & attached Farm Buildings, Green Lane, Grade II
15. Water Lane Cottage, Water Lane, Grade II

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Dixies Barns,
High Street, Ashwell,
Hertfordshire, SG7 5NT
t 01462 743647
f 01462 743648
e ashwell@csaenvironmental.co.uk

Project	Home Field, Bovingdon	Date	March 2015	Drawing Number	CSa/2614/102
Title	Magic Map Extract	Scale	Not to Scale	Revision	-
Client	Taylor Wimpey Strategic	Drawn	JC	Checked	RC

Appendix E

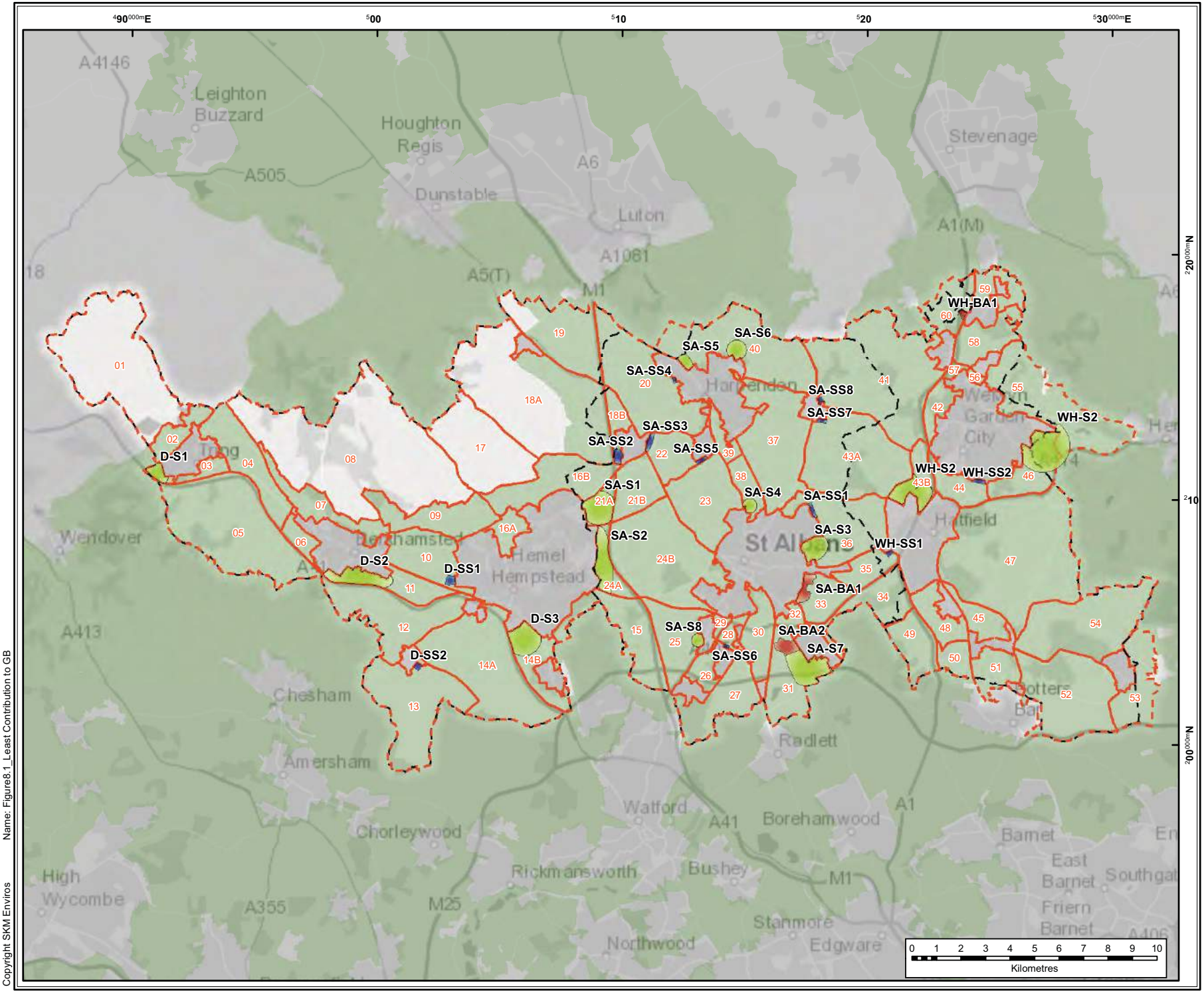
Purposes Assessment Criteria Questions from SKM Green Belt Review

Table 5.4. Purposes Assessment Criteria Questions

Purpose	***Definition of Purpose to be applied in Assessment***
To check the unrestricted sprawl of large built-up areas	1) Does the parcel act, in itself, as an effective barrier against sprawl from large built-up areas outside of the study area specifically London, Luton & Dunstable and Stevenage? 2) Does the parcel contribute, as part of a wider network of parcels, to a strategic barrier against the sprawl of these built-up areas?
To prevent neighbouring towns from merging	3) Does the parcel provide, or form part of, a gap or space between existing 1st tier settlements (neighbouring towns)? 4) What is the distance of the gap between the settlements? 5) Is there evidence of ribbon development on major route corridors? 6) What is the visual perception of the gap between settlements from major route corridors? 7) Would a reduction in the gap compromise the separation of settlements in physical terms? 8) Would a reduction in the gap compromise the separation of settlements and the overall openness of the parcel visually?
To assist in safeguarding the countryside from encroachment	9) What countryside / rural characteristics exist within the parcel including agricultural or forestry land uses and how is this recognised in established national and local landscape designations? 10) Has there already been any significant encroachment by built development or other urbanising elements? (Specify the proportion (%) of built development in the parcel)
To preserve the setting and special character of historic towns	11) What settlements or places with historic features exist within the parcel? 12) What is the relationship and connection (in the form of character, views and visual perception) between the parcel and historic feature? 13) Does the parcel provide an open setting or a buffer against encroachment by development around settlements or places with historic features?
Local Purpose	***Assessment Criteria***
Maintaining existing settlement pattern	14) Same assessment as 2nd purpose, applied to spaces and gaps between the tiers of settlement below 1st to 1st tier.

Appendix F

Figure 8.1: Land Contributing Least Towards Green Belt Purposes from SKM Green Belt Review



Key:

- Boundary Adjustment
- Small Scale Sub-Area
- Strategic Sub-Area
- Study Area Outer Boundary
- District Borough Boundary
- Land Parcel Boundary
- Green Belt

N

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

REVISION: H

Green Belt Review for St Albans, Dacorum and Welwyn Hatfield

FIGURE 8.1. Land Contributing Least Towards Green Belt Purposes

SCALE	*PROJECT CODE*
1:145,000 @ A3	JE30761
CONTENT	*DRAWN*
London.Gov Ordnance Survey	KW
CHECKED	*DATE*
RB	2/12/2013

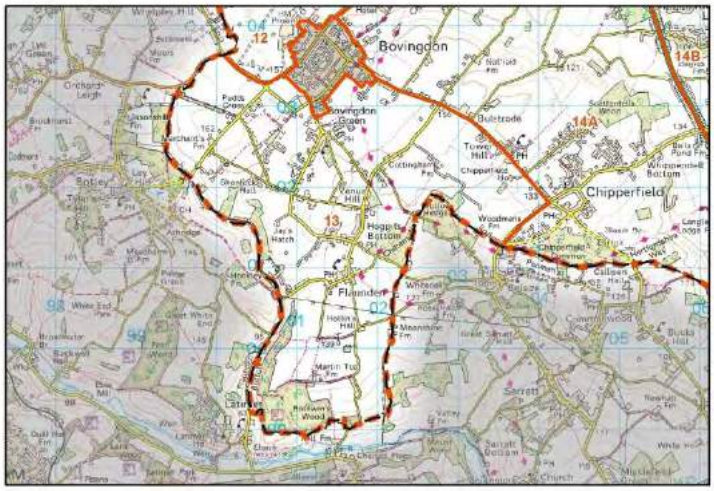
SINCLAIR KNIGHT MERZ SKM ENVIROS

Appendix G

Parcel Assessment Sheets for Dacorum Borough Council

GB13 –Green Belt Land to the South of Bovingdon

Description: The parcel is located to the south of Bovingdon extending south to the edge of the study area. It is 1,087 ha in size and comprises a large gently undulating chalk plateau.



Land use: Predominately arable farmland, plus Bovingdon Brickworks (MDS), caravan site (travelling show-people) and playing fields.

View to northwest from Flaunden Lane towards Bovingdon showing strong open and rural characteristics as well as development in the Green Belt

Example of enclosed southeast edge of Bovingdon displaying enclosure and urban influence

Principal Function / Summary

Significant contribution towards safeguarding the countryside and preserving the setting of Flaunden and Chipperfield. Partial contributions towards maintaining the existing settlement pattern. Overall the parcel contributes significantly to 2 out of 5 purposes.

GB13 – Green Belt Purposes Assessment	Contribution
To check the unrestricted sprawl of large built-up areas	**LIMITED OR NO**
The parcel is located away from large built-up areas of London, Luton and Dunstable and Stevenage. It does not form a connection with a wider network of parcels to restrict sprawl	
To prevent neighbouring towns from merging	**LIMITED OR NO**
The parcel does not fully separate neighbouring 1st tier settlements.	
To assist in safeguarding the countryside from encroachment	**SIGNIFICANT**
The parcel displays typical rural and countryside characteristics in medium sized arable fields with some pasture, bound by dense hedgerows and frequent hedgerow trees. Fragmented small pockets of deciduous woodland are scattered over the parcel with larger areas of ancient woodland, particularly at Baldwin's Wood in the south. Urban features include the Brickworks and other development and unclassified settlements. Dispersed ribbon development and large single dwelings extend along minor routes, particularly from Bovingdon Green to Flaunden and Chipperfield. As a result the parcel exhibits mixed levels of visual openness. Land to the southeast of Bovingdon in particular displays greater levels of enclosure due to landscape features and urban influence due to residential edges.	
To preserve the setting and special character of historic towns	**SIGNIFICANT**
The parcel contains Flaunden and part of Chipperfield Conservation Areas and is adjacent to Bovingdon Conservation Area. It forms part of the wider setting for the historic villages of Latimer and Chenies to the south of the parcel (in Chiltern District). The Green Belt acts as an immediate open and rural historic setting, providing views to and from the countryside.	
To maintain existing settlement pattern	**PARTIAL**
The parcel provides the secondary local gap between Bovingdon (2nd) and Chipperfield (3rd) which is 2.1km. The gap is large and has been subject to ribbon development which limits the perception of the gap. Any small scale reduction in the gap could be likely to compromise separation of the settlements in physical terms, or levels of visual openness.	

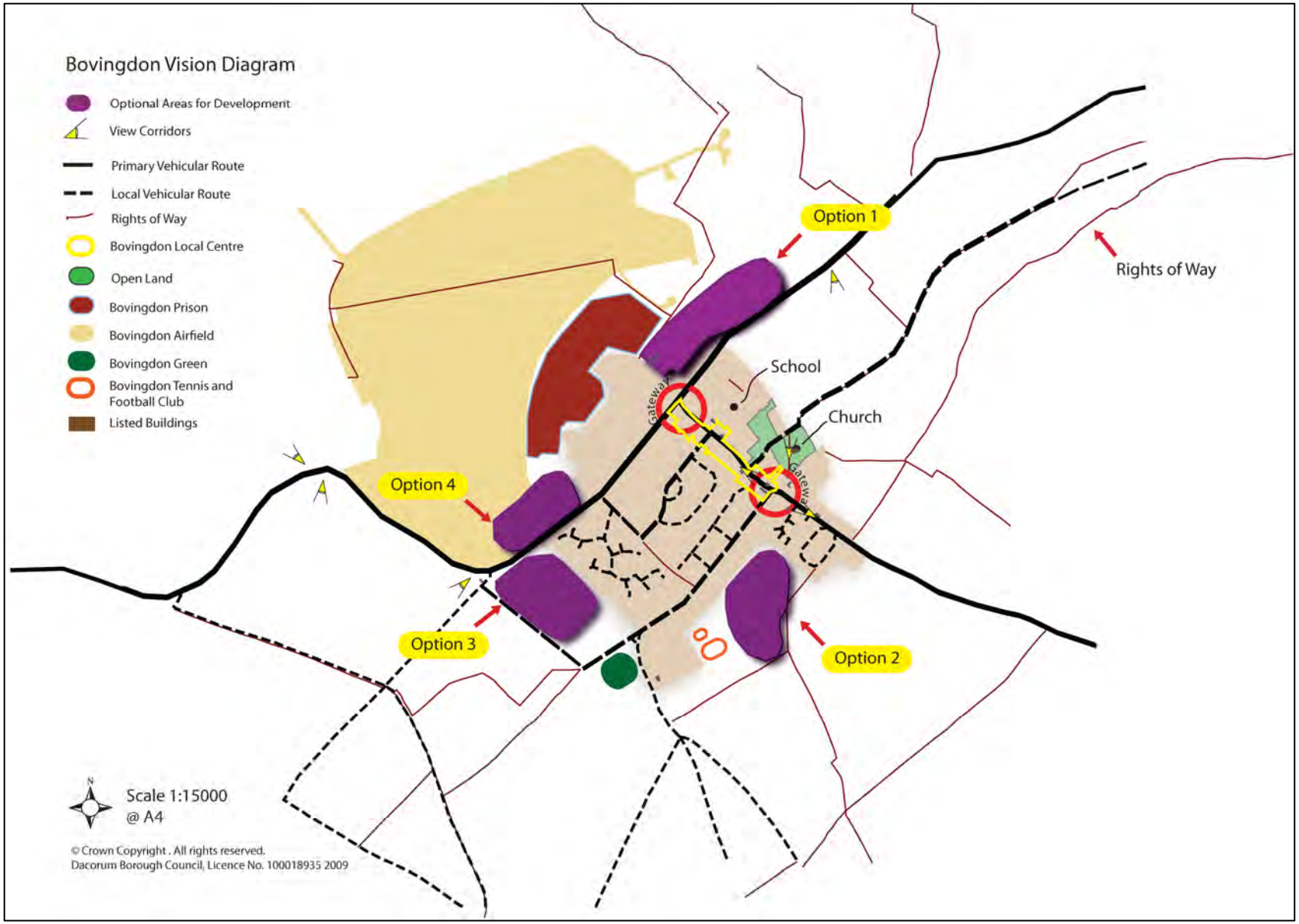
Level of openness and countryside character
Existence of built development The level of built development is low at 0.8%. Residential ribbon development has spread from villages and hamlets along narrow country lanes.
Visual Openness The parcel has limited opportunities for open views due to the densely hedged narrow lanes and there are few focal points or vistas within the landscape.
Countryside Character Predominantly agricultural but the settlement pattern comprises a number of villages which have spread across the plateau organically, leaving settlement edges loose and indistinct in many places.

GB13 – Next Steps
Land at southeast edge of Bovingdon at Homefield, off Green Lane is recommended for further assessment as a small scale sub-area (D-SS2). Assessed in isolation this land makes a limited or no contribution towards checking sprawl, preventing merging or maintaining local gaps. The land makes a relatively limited contribution to the primary functions of the Green Belt.

Appendix H

Bovingdon Spatial Strategy for the Village, Options for Growth

Figure 3.1 – Bovingdon Vision Diagram



Appendix I

Review of Green Belt Options

OPTION 1	**Duckhall Farm**

SITE PHOTO

LANDSCAPE POLICY	CS5: The Green Belt Outside Settlement Boundary and therefore located in the countryside
LANDSCAPE QUALITY AND VALUE	Medium / Low and Low
LANDSCAPE SENSITIVITY	Low / Medium
GREEN BELT REVIEW BY DACORUM BOROUGH COUNCIL	May increase urban sprawl, provides local wildlife corridors, important part of the surrounding countryside.
PUBLIC RIGHTS OF WAY & HERITAGE ASSETS	Not publically accessible, Public footpath adjacent to part of Western boundary. Duckhall Farm and Honours Farm, indented into the south of the option are Listed Buildings

SITE DESCRIPTION

Option 1 occupies an area of rough grassland dissected by multiple hedgerows with trees located at the northern edge of Bovingdon. The southern fields of the option are surrounded by development to the east, south and HMP The Mount to the west. The northern fields extend beyond the existing built up area of Bovingdon and provide a gap between the village and a small number of dwellings at Hempstead Road.

LANDSCAPE / GREEN BELT ASSESSMENT

The option is well related to the existing settlement at its southern end, however the middle and northern extents of the option extend further than existing development at the settlement and would result in coalescence with a number of dwellings along the Hempstead Road. It is considered to be of medium landscape quality and is dissected by a large number of mature hedgerows and trees, which would constrain development on this option, along with the Listed Buildings at the southern end of the Option. Development at this location would encroach into the countryside and would be visible along the road on the approach to the village.

Option 1

Public Right of Way

OPTION 2	**Rear of Green Lane**

SITE PHOTO

LANDSCAPE POLICY	CS5: The Green Belt Outside Settlement Boundary and therefore located in the countryside
LANDSCAPE QUALITY AND VALUE	Medium / Low and Low
LANDSCAPE SENSITIVITY	Medium / Low
GREEN BELT REVIEW BY DACORUM BOROUGH COUNCIL	Accessible to village centre, option forms part of the wider countryside. Forms sub-parcel D-SS2, which is suggested to contribute little to the Green Belt purposes
PUBLIC RIGHTS OF WAY & HERITAGE ASSETS	The Hertfordshire Way Long Distance Footpath runs adjacent to the eastern boundary. No heritage assets.

SITE DESCRIPTION

Option 2 comprises 1 large field, 2 smaller and part of an adjoining field. The fields are currently being used for typical urban fringe uses such as horse grazing. The fields have mature trees and vegetation to their boundaries and are well related to the existing urban area to the north and west.

LANDSCAPE / GREEN BELT ASSESSMENT

The option is well related to the existing housing area, with development to the north, west and east and with playing fields to the south. It would not encroach particularly onto the adjoining countryside but the mature, well vegetated boundaries of the fields would provide defensible boundaries, a robust edge to development and minimise views from the surrounding countryside. Development at this location could compliment the existing settlement pattern. No heritage assets will be impacted upon.

AERIAL PHOTOGRAPH

OPTION 3	**Grange Farm**

SITE PHOTO

LANDSCAPE POLICY	CS5: The Green Belt Outside Settlement Boundary and therefore located in the countryside
LANDSCAPE QUALITY AND VALUE	Medium / Low and Low
LANDSCAPE SENSITIVITY	Medium
GREEN BELT REVIEW BY DACORUM BOROUGH COUNCIL	Further from village centre, represents a gap between brickworks and village, prominant from existing roads and important part of countryside
PUBLIC RIGHTS OF WAY & HERITAGE ASSETS	No public rights of way, Grade II listed building is located close to the north western corner of the option

SITE DESCRIPTION

Option 3 comprises two fields sub-divided by post and wire fences with some evidence of use as playing fields. The eastern boundary contains mature trees, with the other boundaries containing fewer trees and some hedgerow planting. The western boundary abuts the B4505 and the disused airfield. The southern boundary abuts Green Lane which has a rural character.

LANDSCAPE / GREEN BELT ASSESSMENT

Development at this location would result in a significant expansion to the south of the village, beyond the built up area of Bovingdon and would impact on the rural character and countryside of Green Lane. Partial views of development would be available from the disused airfield. Development would also be visible from the approach into the village along the B4505.

AERIAL PHOTOGRAPH

OPTION 4	**North Chesham Road**

SITE PHOTO

Option 4: east of Molyneux Avenue

Option 4: west of Molyneux Avenue

LANDSCAPE POLICY	CS5: The Green Belt Outside Settlement Boundary and therefore located in the countryside Option 4 east: Location Allocation 6 - Chesham Road/Molyneaux Avenue
LANDSCAPE QUALITY AND VALUE	Low and Medium / Low
LANDSCAPE SENSITIVITY	East Site - Low West Site - Medium
GREEN BELT REVIEW BY DACORUM BOROUGH COUNCIL	Seperated from village by relatively busy road, further from village centre, airfield side is prominant from Chesham Road, wildlife corridor.
PUBLIC RIGHTS OF WAY & HERITAGE ASSETS	No public rights of way cross the site or are located in close proximity. No heritage assets.

SITE DESCRIPTION

The area east of Molyneaux Avenue is overgrown with scrub and birch. The area is enclosed by existing development to the north, east and west with the disused airfield to the south. The area west of Molyneaux Avenue comprises part of the disused airfield, located close to the B4505.

LANDSCAPE / GREEN BELT ASSESSMENT

The option east of Molyneaux Avenue is well related to the existing urban area of Bovingdon with robust boundaries and connections to Molyneaux Avenue and the B4505. The option west of Molyneaux Avenue is more open in character as a result of its previous use as an airfield. Development at this location would extend the settlement beyond its current limites and would be more readily apparent from the surroundings, particulary on the approach to the village along the B4505.

AERIAL PHOTOGRAPH

Option 4

Public Right of Way

Appendix J

Landscape and Visual Effects Tables

LANDSCAPE/TOWNSCAPE EFFECTS					
Direct effects on landscape features	**Quality & Sensitivity**	**Existing Conditions**	**Impact and Mitigation**	**Magnitude of Change**	**Effect**
Hedgerows	Medium	There are hedgerows at the boundaries of the Site, some are field hedgerows and others form parts of rear garden boundaries.	The existing hedgerows can be retained and incorporated into the layout. New hedgerow planting can be included as part of the proposals.	Low	Slight Beneficial
Trees / scrub	Medium	There are mature trees at all of the boundaries particularly the eastern and southern boundaries.	The trees can be retained and incorporated into the layout as part of the scheme. Retention of the existing trees will allow the Site to retain its strong sense of enclosure from the wider countryside. New tree planting can also be provided as part of the proposals.	Low	Slight Beneficial
Rough grassland	Medium / Low	The Site currently comprises an area of rough grassland grazed by horses.	The majority of the existing grassland land will be lost and replaced with suburban housing and open space.	High	Moderate Adverse
Heritage assets	N/A	No registered assets within the Site.	None	Neutral	Neutral
Public Rights of Way	Medium	The Hertfordshire Way Long Distance Footpath ('HWLDF') runs adjacent to the northern half of the eastern boundary.	The footpath can be retained along its existing route and with the retention of trees at the eastern boundary views of the Site will continue to be filtered.	Neutral	Neutral
Indirect effects on landscape character		**Existing Conditions**	**Impact and Mitigation**	**Magnitude of Change**	**Effect**
Neighbouring area	Medium	The surrounding urban area comprises a mix of post 1960s development with some older development at Green Lane.	The Site is contained by the surrounding urban area such that it makes little contribution to the wider landscape / townscape setting. There will be views from the adjoining dwellings at Green Lane, Yew Tree Drive and Austins Mead but the existing trees and vegetation at the Site boundaries prevent views from the wider landscape and townscape.	High – for those properties immediate to the Site. Low - for the surrounding area	Moderate Adverse Negligble
Landscape Value	Medium / Low	The Site is not publically accessible and contains no recognised heritage assets. The HWLDF runs adjacent to part of the eastern boundary. Due to its contained nature it makes little contribution to the wider townscape.	There are few public views of the Site and as it is not publically accessible it is unlikely to be highly valued.	Medium / Low	Slight Adverse
Cumulative impacts		No known cumulative impacts.			

VISUAL EFFECTS					
Viewpoint	**Sensitivity**	**Existing Conditions**	**Proposals and mitigation**	**Magnitude of Change**	**Visual Effect**
Views from properties at Yew Tree Drive and Austins Mead	High	Views are available from gardens, ground and first floor windows of the rear of the properties which back onto the Site. A small number of views are filtered by existing vegetation at the Site boundary or within the gardens.	The Site layout can be designed to minimise impact on the residential properties and in addition new planting can be provided to allow a buffer between the existing dwellings and the development.	High	Moderate Adverse
Views from properties at Green Lane	Medium	There a number of dwellings which back onto the western boundary of the Site with a small number of properties gaining views into the Site. These views are filtered by existing vegetation at the Site boundaries and within the gardens.	The existing filtered views will be replaced with glimpses of new development which will be more apparent from some dwellings than others.	Medium	Slight / Moderate Adverse
Views from the Hertfordshire Way Long Distance Footpath ('HWLDF') (Photograph 04 &05)	Medium	Views from the short stretch of the footpath which runs adjacent to the eastern boundary have heavily filtered views of the Site through the trees at the boundaries.	The footpath currently runs through Austins Mead and development at the Site will result in the footpath running adjacent to development for a short distance longer than at present. The retention, however, of the existing trees will result in views of the development remaining heavily filtered.	Medium	Slight Adverse
Views the HWLDF (Photograph 06)	Medium	From the southern corner of the adjacent field along the HWLDF heavily filtered views of the Site are seen through the boundary vegetation.	The existing vegetation will remain and will continue to filter views from this location. The filtered views, however will be of the development.	Negligible	Slight Adverse
Bovingdon Conservation Area	High	There are no views of the Site from the Conservation Area.	None required.	Neutral	Neutral
HWLDF south of the Site (Photograph 10)	Medium	There are no views of the Site from this section of the footpath.	None required.	Neutral	Neutral
The Chiltern Way Long Distance Footpath (Photographs 16 & 17)	Medium	There are no views of the Site from the footpath north west of the Site and the village.	None required.	Neutral	Neutral
Chipperfield Road (Photograph 21)	Medium	There are no views of the Site from the approach into the village or the public footpath.	None required.	Neutral	Neutral

Appendix K

Methodology

CSa Methodology for Landscape and Visual Appraisals

M1 In landscape and visual appraisal, a distinction is normally drawn between ***landscape/townscape effects*** (i.e. effects on the character or quality of the landscape (or townscape), irrespective of whether there are any views of the landscape, or viewers to see them) and ***visual effects*** (i.e. effects on people's views of the landscape, principally from residential properties, but also from public rights of way and other areas with public access). Thus, a development may have extensive landscape effects but few visual effects (if, for example, there are no properties or public viewpoints nearby), or few landscape effects but substantial visual effects (if, for example, the landscape is already degraded or the development is not out of character with it, but can clearly be seen from many residential properties and/or public areas).

M2 The assessment of landscape & visual effects is less amenable to scientific or statistical analysis than some environmental topics and inherently contains an element of subjectivity. However, the appraisal should still be undertaken in a logical, consistent and rigorous manner, based on experience and judgement, and any conclusions should be able to demonstrate a clear rationale. To this end, various guidelines have been published, the most relevant of which (for appraisals of the effects of a development, rather than of the character or quality of the landscape itself), form the basis of the assessment and are as follows:-

- 'Guidelines for Landscape & Visual Impact Assessment', produced jointly by the Institute of Environmental Assessment and the Landscape Institute (GLVIA 3rd edition 2013); and
- 'Landscape Character Assessment, Guidance for England and Scotland, 2002', to which reference is also made. This stresses the need for a holistic assessment of landscape character, including physical, biological and social factors.

LANDSCAPE/TOWNSCAPE EFFECTS

M3 Landscape/townscape quality is a subjective judgement based on the value and significance of a landscape/townscape. It will often be informed by national, regional or local designations made upon it in respect of its quality e.g. AONB. Sensitivity relates to the ability of that landscape/townscape to accommodate change.

Landscape sensitivity can vary with:-

(i) existing land use;
(ii) the pattern and scale of the landscape;
(iii) visual enclosure/openness of views, and distribution of visual receptors;
(iv) the scope for mitigation, which would be in character with the existing landscape; and
(v) the value placed on the landscape.

M4 There is a strong inter-relationship between landscape/townscape quality and sensitivity as high quality landscapes/townscapes usually have a low ability to accommodate change.

M5 For the purpose of our appraisal, landscape/townscape quality and sensitivity has been combined and is assessed using the criteria in Table LE1. Typically, landscapes/townscapes which carry a quality designation and which are otherwise attractive or unspoilt will in general be more sensitive, while those which are less attractive or already affected by significant visual detractors and disturbance will be generally less sensitive.

M6 The concept of landscape/townscape value is also considered, in order to avoid consideration only of how scenically attractive an area may be, and thus to avoid undervaluing areas of strong character but little scenic beauty. Landscape value is:

'The relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons.'

M7 Nationally valued landscapes are recognised by designation, such as National Parks and Areas of Outstanding Natural Beauty ('AONB') which have particular planning policies applied to them. Nationally valued townscapes are typically those covered by a Conservation Area or similar designation.

M8 The magnitude of change is the scale, extent and duration of change to a landscape arising from the proposed development and was assessed using the criteria in Table LE2.

M9 Landscape/townscape effects were assessed in terms of the interaction between the magnitude of the change brought about by the development and the sensitivity of the landscape resource affected. The landscape/townscape effects can be either beneficial or adverse.

M10 In this way, landscapes of the highest sensitivity and quality, when subjected to a high magnitude of change from the proposed development, are likely to give rise to 'substantial' landscape effects which can be either adverse or beneficial. Conversely, landscapes of low sensitivity and quality, when subjected to a low magnitude of change from the proposed development, are likely to give rise to only 'slight' or neutral landscape effects. Beneficial landscape effects may arise from such things as the creation of new landscape features, changes to management practices and improved public access.

VISUAL EFFECTS

M11 Visual effects are concerned with people's views of the landscape/townscape and the change that will occur. Like landscape effects, viewers or receptors are categorised by their sensitivity. For example, views from private dwellings are generally of a higher sensitivity than those from places of work.

M12 In describing the content of a view the following terms are used:-

- No view - no views of the development;
- Glimpse - a fleeting or distant view of the development, often in the context of wider views of the landscape;
- Partial - a clear view of part of the development only;
- Filtered - views to the development which are partially screened, usually by intervening vegetation - the degree of filtering may change with the seasons;
- Open - a clear view to the development.

M13 The sensitivity of the receptor was assessed using the criteria in Table VE1.

M14 The magnitude of change is the degree in which the view(s) may be altered as a result of the proposed development and will generally decrease with distance from its source, until a point is reached where there is no discernible change. The magnitude of change in regard to the views was assessed using the criteria in Table VE2.

M15 Visual effects were then assessed in terms of the interaction between the magnitude of the change brought about by the development and also the sensitivity of the visual receptor affected.

M16 Photographs were taken with a digital camera with a lens that approximates to 50mm, to give a similar depth of view to the human eye. In some cases images have been joined together to form a panorama. The prevailing weather and atmospheric conditions, and any effects on visibility are noted.

Mitigation & Residual Effects

M17 Mitigation measures are described as those measures, including any process or activity, designed to avoid, reduce and compensate for adverse landscape and/or visual effects of the proposed development.

M18 In situations where proposed mitigation measures are likely to change over time, as with planting to screen a development, it is important to make a distinction between any likely effects that will arise in the short-time and those that will occur in the long-term or 'residual effects' once mitigation measures have established. In this assessment, the visual effects of the development have been considered at completion of the entire project and once any landscape mitigation has had an opportunity to establish.

M19 Mitigation measures can have a residual, positive impact on the effects arising from a development, whereas the short-term impact may be adverse.

ASSESSMENT OF EFFECTS

M20 The appraisal concisely considers and describes the main landscape and visual effects resulting from the proposed development. The narrative text demonstrates the reasoning behind judgements concerning the landscape and visual effects of the proposals. Where appropriate the text is supported by tables which summarise the sensitivity of the views/ landscape, the magnitude of change and describe any resulting effects.

CUMULATIVE EFFECTS

M21 Cumulative effects are *'the additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together.'*

M22 In carrying out landscape appraisal it is for the author to form a judgement on whether or not it is necessary to consider any planned developments and to form a judgement on how these could potentially affect a project.

Table LE 1 LANDSCAPE / TOWNSCAPE QUALITY AND SENSITIVITY

Description of the Landscape/Townscape	Very High	High	Medium	Low
	Landscape Quality: Intact and very attractive landscape which may be nationally recognised/designated for its scenic beauty. e.g. National Park or Area of Outstanding National Beauty **Townscape Quality**: A townscape of very high quality which is unique in its character, and recognised nationally/internationally. e.g. World Heritage Site **Sensitivity:** A landscape/townscape with a very low ability to accommodate change because such change would lead to a significant loss of valuable features or elements, resulting in a significant loss of character and quality. Development of the type proposed would be discordant and prominent.	**Landscape Quality:** A landscape, usually combining varied topography, historic features and few visual detractors. A landscape known and cherished by many people from across the region. e.g. County Landscape Site such as a Special Landscape Area. **Townscape Quality**: A well designed townscape of high quality with a locally recognised and distinctive character e.g. Conservation Area **Sensitivity:** A landscape/townscape with limited ability to accommodate change because such change would lead to some loss of valuable features or elements, resulting in a significant loss of character and quality. Development of the type proposed would likely be discordant with the character of the landscape/townscape.	**Landscape Quality:** Non-designated landscape area, generally pleasant but with no distinctive features, often displaying relatively ordinary characteristics. **Townscape Quality**: A typical, pleasant townscape with a coherent urban form but with no distinguishing features or designation for quality. **Sensitivity:** A landscape/townscape with reasonable ability to accommodate change. Change would lead to a limited loss of some features or elements, resulting in some loss of character and quality. Development of the type proposed would not be especially discordant.	**Landscape / Townscape Quality:** Unattractive or degraded landscape/townscape, affected by numerous detracting elements e.g. industrial areas, infrastructure routes and un-restored mineral extractions. **Sensitivity:** A landscape/townscape with good ability to accommodate change. Change would not lead to a significant loss of features or elements, and there would be no significant loss of character or quality. Development of the type proposed would not be discordant with the landscape/townscape in which it is set.

Footnote:

1. A distinction has been drawn between landscape/townscape quality and sensitivity. Quality is as a subjective judgement on perception and value of a landscape/townscape and may be informed by any national, regional or local designations for its quality. Sensitivity relates to the ability of that landscape/townscape to accommodate change.

Table LE 2 LANDSCAPE / TOWNSCAPE MAGNITUDE OF CHANGE

Description of the Change predicted	
High	Total loss of or severe damage to key characteristics, features or elements.
Medium	Partial loss of or damage to key characteristics, features or elements
Low	Minor loss of or alteration to one or more key landscape/townscape characteristics, features or elements
Negligible	Very minor loss or alteration to one or more key landscape/townscape characteristics, features or elements
Neutral	No loss or alteration of key landscape/townscape characteristics, features or elements

Table LE 3 LANDSCAPE / TOWNSCAPE EFFECTS

Description of the Effect	
Substantial	The proposals are damaging to the landscape/townscape in that they: • are at variance with the landform, scale and pattern of the landscape/townscape; • are visually intrusive and would disrupt important views; • are likely to degrade or diminish the integrity of a range of characteristic features and elements and their setting; • will be damaging to a high quality or highly vulnerable landscape/townscape; • cannot be adequately mitigated.
Moderate	The proposals are: • out of scale or at odds with the landscape; • are visually intrusive and will adversely impact on the landscape/townscape; • not possible to fully mitigate; • will have an adverse impact on a landscape/townscape of recognised quality or on vulnerable and important characteristic features or elements.
Slight	The proposals: • do not quite fit the landform and scale of the landscape/townscape; • will impact on certain views into and across the area; • cannot be completely mitigated for because of the nature of the proposal or the character of the landscape/ townscape; • affect an area of recognised landscape/ townscape quality.
Neutral	The proposals: • complement the scale, landform and pattern of the landscape/townscape; • incorporate measures for mitigation to ensure that the scheme will blend in well with the surrounding landscape/townscape; • avoid being visually intrusive and adversely effecting the landscape/townscape; • maintain or improve existing landscape/ townscape character.

Footnote:

1. Each level (other than neutral) of change identified can be either regarded as 'beneficial' or 'adverse'.

Table VE 1

VISUAL SENSITIVITY

Description of the Receptor	High	Medium	Low
	Residential properties with predominantly open views from windows, garden or curtilage. Views will normally be from ground and first floors and from two or more windows of rooms in use during the day. Users of Public Rights of Way with predominantly open views in sensitive or unspoilt areas. Non-motorised users of minor or unclassified roads in the countryside. Visitors to recognised viewpoints or beauty spots. Users of outdoor recreational facilities with predominantly open views where the purpose of that recreation is enjoyment of the countryside - e.g. Country Parks, National Trust or other access land etc.	Residential properties with partial views from windows, garden or curtilage. Views will normally be from first floor windows only, or an oblique view from one ground floor window, or may be partially obscured by garden or other intervening vegetation. Users of Public Rights of Way with restricted views, in less sensitive areas or where there are significant existing intrusive features. Users of outdoor recreational facilities with restricted views or where the purpose of that recreation is incidental to the view e.g. sports fields. Schools and other institutional buildings, and their outdoor areas. Users of minor or unclassified roads in the countryside, whether motorised or not.	People in their place of work. Users of main roads or passengers in public transport on main routes. Users of outdoor recreational facilities with restricted views and where the purpose of that recreation is unrelated to the view e.g. go-karting track.

Table VE 2 VISUAL MAGNITUDE OF CHANGE

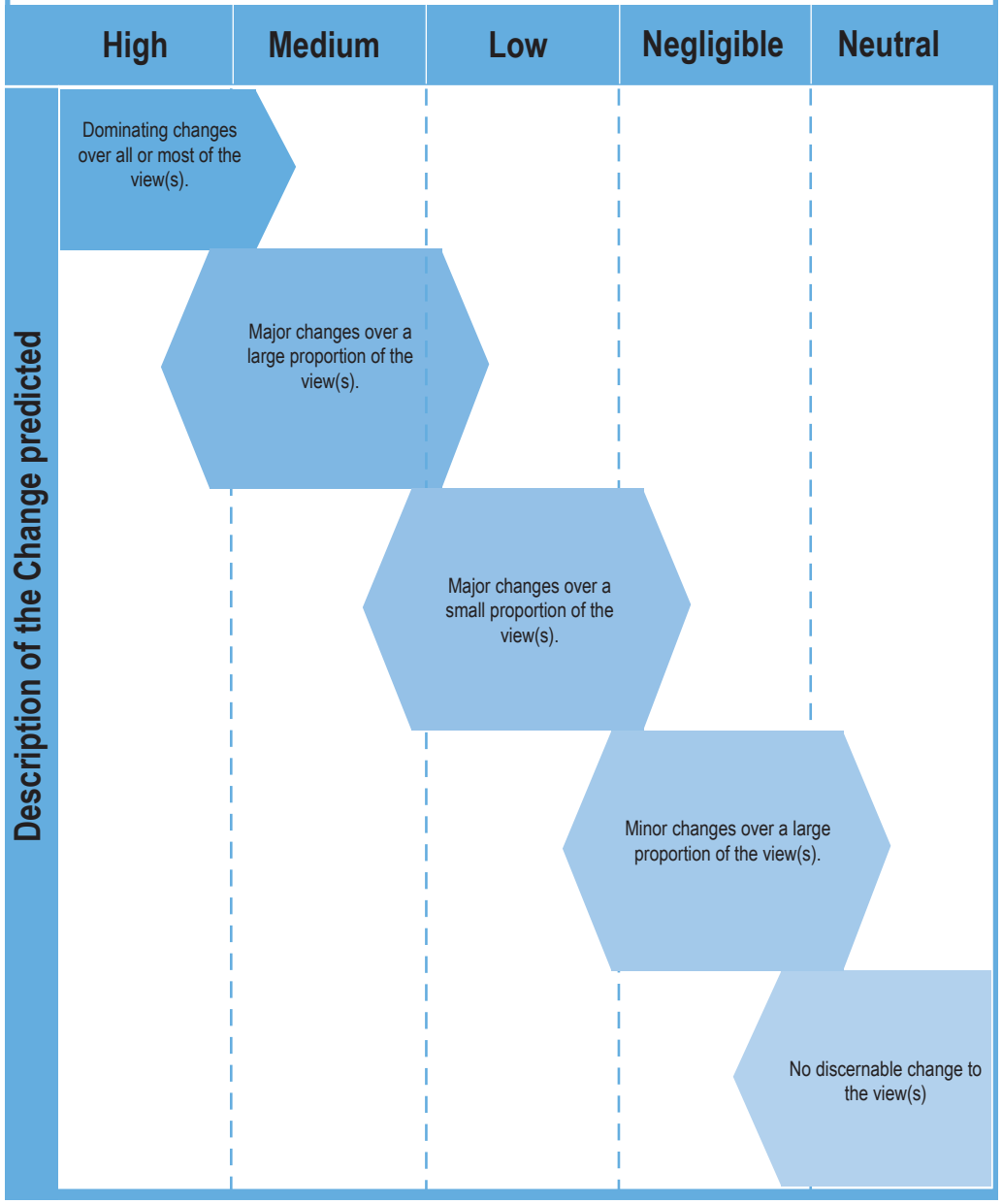
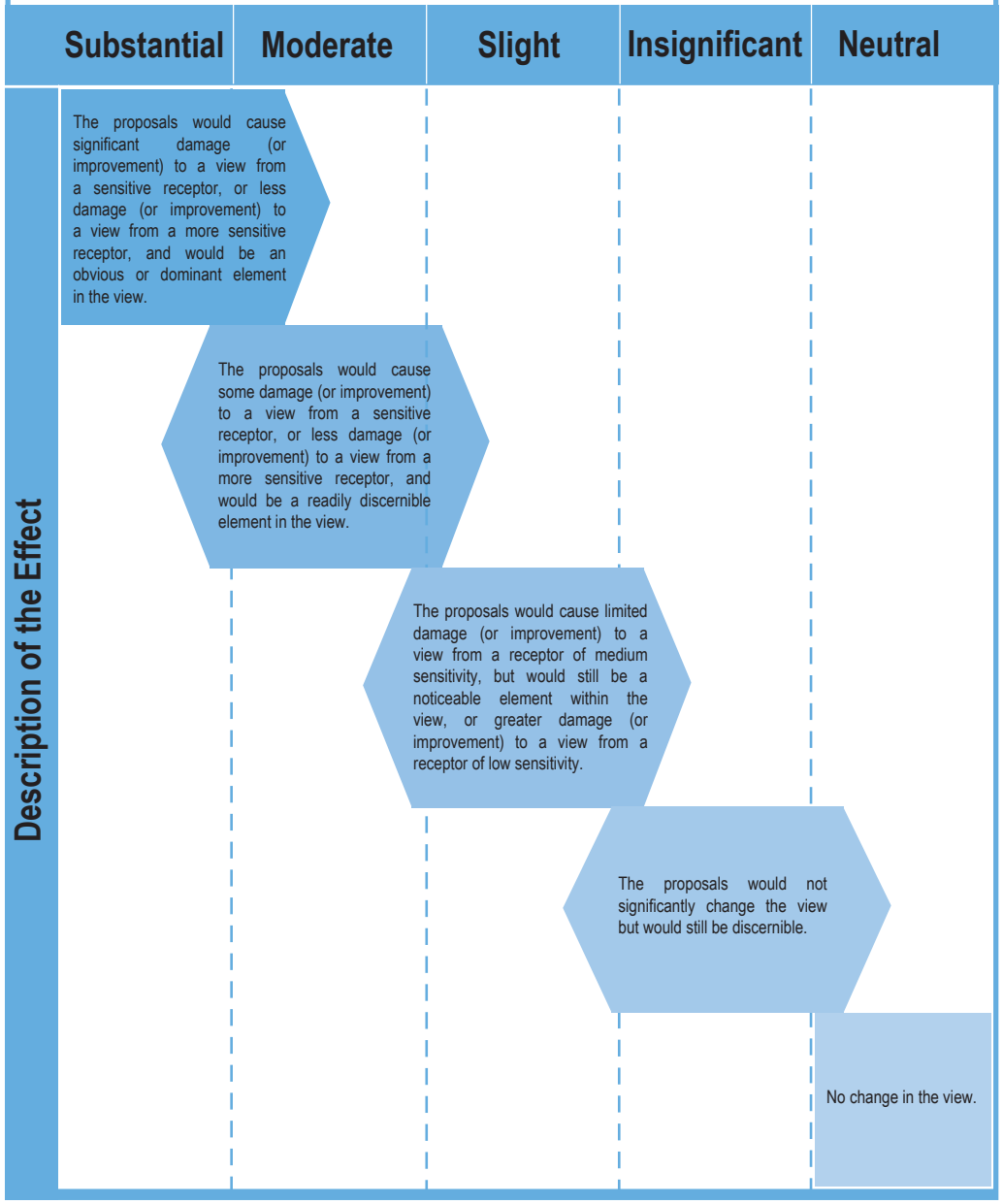


Table VE 3 VISUAL EFFECTS



Footnote:

1. Each level (other than neutral) of change identified can be either regarded as 'beneficial' or 'adverse'.