

LAND SOUTH OF HILL DYKE ROAD, WHEATHAMPSTEAD

TRANSPORTATION ASSESSMENT

Client: Taylor Wimpey UK Ltd

Engineer: Wormald, Burrows Partnership Limited
12a – 18a Hitchin Street
Biggleswade
Bedfordshire SG18 8AX
Tel: (01767) 317 244
Fax (01767) 315 434

Original Date: March 2013

Original WBP Ref: E3090-hdr-mjl-tareport-0413-rev0

Written By:

Checked By:

Approved By:

Michael Lowiss
Graduate Engineer

Andrew Chipchase
Associate Director

Jim Best
Director

Status: Draft

COPYRIGHT

© Wormald Burrows Partnership Limited. All rights reserved. The contents of this document must not be copied or reproduced in whole or in part without the written consent of Wormald Burrows Partnership and Taylor Wimpey UK Ltd.

DISCLAIMER

Wormald Burrows Partnership Limited has attempted to produce this document in accordance with all known and relevant legislation, policies, standards and methodologies at the time of publication. We cannot, however, be held responsible for the effect any changes in these will have on the document. We therefore recommend that the information contained within be checked for relevance before it is used.



REGISTRATION OF AMENDMENTS

Revision	Date	Amendment Details	Prepared by	Checked by
Rev 0	16.04.13	Original version	Michael Lowiss	Andrew Chipchase
Rev 1	18.11.14	Number of dwellings revised. Planning policy framework updated.	Andrew Chipchase	Kevin Sykes

CONTENTS

1	INTRODUCTION.....	7
2	DEVELOPMENT PROPOSAL AND PLANNING POLICY FRAMEWORK.....	8
3	EXISTING CONDITIONS.....	10
4	PROPOSED DEVELOPMENT.....	24
5	APPRAISING THE IMPACT OF THE PROPOSED DEVELOPMENTS.....	26
6	ASSESSMENT YEARS AND TRAFFIC GROWTH.....	29
7	ANALYSIS PERIOD.....	30
8	DEVELOPMENT TRIP GENERATION.....	31
9	TRANSPORT IMPACTS AND MITIGATION MEASURES.....	33
10	CONCLUSIONS.....	40

APPENDICES

Appendix A	Drawing No E3090/01, 'Location Plan' Drawing No E3090/07, 'Facilities Plan' Drawing No E3090/08, 'Facilities near the Site'
Appendix B	Air Quality Management Area Map
Appendix C	Drawing No E3090/10, 'Footway and Cycleway Paths'
Appendix D	St Albans City & District Council Cycling Map
Appendix E	Drawing No E3090/09, 'Bus Routes'
Appendix F	Drawing No E3090/12 '2012 Surveyed Traffic Flows AM' Drawing No E3090/13 '2012 Surveyed Traffic Flows PM'
Appendix G	Drawing No E3090/37, 'Proposed Roundabout The Hill/Hill Dyke Road Junction'

1 INTRODUCTION

- 1.1.1 The purpose of this document is to report on transportation matters in respect of the proposed housing development by Taylor Wimpey Developments Limited on a site within the Wheathampstead Parish of Hertfordshire.
- 1.1.2 The site covers existing agricultural land, south of Hill Dyke Road. For the purposes of this report the site will be referred to as Land South of Hill Dyke Road.
- 1.1.3 Wormald, Burrows Partnership Limited (WBPL) has been appointed to assess the impact that the development will have on the surrounding road network, sustainable transport measures and the mitigation measures proposed to address residual impacts. This transportation assessment therefore describes this work in support of the forthcoming planning application.
- 1.1.4 The proposal is for the development to consist of 100 dwellings.
- 1.1.5 This report assesses the existing conditions of the transportation network, both for public and private modes of transport, and then assesses the impact the proposed development will have on this network. The assessment is made in terms of sustainability and maintaining the capacity of the transportation network to accommodate the increased traffic from the site, together with the matters of environmental impact, and safety.
- 1.1.6 This Transport Assessment (TA) is produced in accordance with the 'Guidance on Transport Assessment' (GTA) published by the Department of Communities and Local Government and the Department for Transport (DfT) March 2007.
- 1.1.7 Discussions were held with Hertfordshire County Council (HCC), who provided the scoping for the assessment.

2 DEVELOPMENT PROPOSAL AND PLANNING POLICY FRAMEWORK

2.1 Introduction

- 2.1.1 The DfT's 'Guidance on Transport Assessment', states (in its Appendix B) that any development of land for 'C3 dwelling houses' use with greater than 80 units requires a Transport Assessment (TA), and should be in line with the National Planning Policy Framework.
- 2.1.2 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
- 2.1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. The policies in NPPF, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system. Section 4 of the NPPF tackles specifically the promoting of sustainable transport.
- 2.1.4 Section 4 states how encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion, and how transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. It mentions how the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel.
- 2.1.5 Transport policies for the proposed site are identified in the "Hertfordshire County Council 3rd Local Transport Plan 2011-2031" which was adopted in 2011.
- 2.1.6 The aim of the Hertfordshire Local Transport Plan is to "provide a safe, efficient and resilient transport system that serves the needs of business and residents across Hertfordshire and minimises its impacts on the environment."
- 2.1.7 The Hertfordshire Local Transport Plan is split into 3 volumes with a number of accompanying daughter documents. Volume 1 describes the strategy and framework for the transport plan using goals and challenges. Volume 2 sets out the County's main transport policies that will achieve the challenges outlined in Volume 1. Volume 3 sets out
-

the schemes/interventions that the Council and partners will deliver in the short and long term. The 5 main goals set out in Volume 1 are as follows:

- Support economic development and planned dwelling growth
- Improve transport opportunities for all and achieve behavioural change in mode choice
- Enhance the quality of life, health and the natural, built and historic environment of all Hertfordshire residents
- Improve the safety and security of residents
- Reduce transport's contribution to greenhouse gas emissions and improve its resilience

2.1.8 The plan takes into account sustainability by “promoting and supporting sustainable travel to reduce growth in car traffic and contribute to improved health and quality of life for residents with a positive impact on the environment and on the wider challenge of reducing the contribution by transport to climate change.”

2.1.9 There are a number of documents shown on the St Albans District Council website for the Local Development Framework evidence base that make use of the previous Hertfordshire Local Transport Plan (2006/07 – 2010/2011). Due to these documents referring to the now superseded Local Transport Plan, this report will follow the policies set out in the latest Local Transport Plan (2011-2031) and associated documents, which it is assumed will be referred to in the emerging Strategic Local Plan.

3 EXISTING CONDITIONS

3.1 Existing Site Information

- 3.1.1 The proposed site is situated at the south east end of Wheathampstead village within the district of St Albans in the county of Hertfordshire. The village is approximately 5km north of St Albans City.
- 3.1.2 The use of the site is for agricultural purposes which is currently for arable farming. The site is surrounded by a line of trees that separate it from the rest of the farm to the south.
- 3.1.3 The proposed site is approximately 3.51 ha (8.67 acres) in area.
- 3.1.4 To the north, the site is bordered by Hill Dyke Road and existing housing. It is bordered by Dyke Lane to the east. To the south is more agricultural land and to the west lies more existing residential housing (Vale Court and Beech Crescent).
- 3.1.5 Drawing E3090/01, "Location Plan" in **Appendix A** indicates the location of the proposed site.
- 3.1.6 The St Albans District Council has three Air Quality Management Areas located within its district boundary; however, none of the areas cover Wheathampstead or the site. A copy of the Defra maps for St Albans District can be found in **Appendix B**.

3.2 Baseline Transport Data

- 3.2.1 B651 The Hill is a local distributor road running north to south through Wheathampstead and has Wheathampstead's High Street situated along its length. It is a category B road, has a nominal width of 6m, and has Hill Dyke Road and Butterfield Road joining it along its east and west sides respectively.
- 3.2.2 Following the road south, it becomes High Street before leading towards Sandridge and St Albans. To the north it becomes High Street, just after its mini-roundabout junction with Marford Road. Continuing along High Street northwards, Church Street joins it on its eastern side. Following High Street further northwards, just before the roundabout which links the B651 and the B653, High Street becomes Station Road. After the roundabout Station Road becomes Lamer Lane which leads out of Wheathampstead and towards a number of small settlements (Kimpton and Blackmore End).

- 3.2.3 Going westwards at the B651/B653 roundabout leads onto the B653 which eventually continues to Harpenden, Luton and the M1. From the same roundabout going eastwards again along the B653 leads towards the A1 and Welwyn Garden City.
- 3.2.4 Butterfield Road, a minor road, is located on the south west edge of Wheathampstead. It joins the B651 at its eastern end and Brewhouse Hill on its western end. The road is approximately 6.4m wide and has a mixture of residential flats and houses located on both sides along its length. It also has residential roads joining it.
- 3.2.5 Following Brewhouse Hill Road south, it becomes Harpenden Road leading to Harpenden centre and the M1. Following Brewhouse Hill north it becomes Church Street which leads back to the B651.
- 3.2.6 Hill Dyke Road, a 6m wide minor road, borders the northern edge of the site. It joins B651 The Hill at its western end and Dyke Lane at its eastern end. Nine residential cul de sac roads come off Hill Dyke Lane along its length: Nurseries Road joins Hill Dyke Lane on its northern side about halfway along its length.
- 3.2.7 Nurseries Road is a 5.4m wide minor road that joins Hill Dyke road at its south east end and Ceasars Road at its northern end. Beach Hyde Primary and Nursery School is located off this road as well as a number of residential houses.
- 3.2.8 Ceasars Road another minor road with a width of 6.5m, joins Dyke Lane at its eastern end and Offas Way at its western end. Nurseries Road links onto it on its southern side about halfway along its length. It also has Conquerors Hill linking onto it on its northern side which leads to Marford Road. Ceasars Road has a number of residential roads and cul de sacs linking off of it.
- 3.2.9 Dyke Lane is a 4.2m wide minor road that joins Marford Road in the north and continues south along the eastern edge of Wheathampstead until it joins the B651 at its southern end, half a kilometre south of Wheathampstead at the 'Wicked Lady' Pub. Ceasars Road and Hill Dyke Lane join it on its western side and on its eastern side it is bordered by Devil's Dyke earthworks (an archaeologically important site).
- 3.2.10 Marford Road is a secondary distributor road of 5.0m width that links between two other distributor roads: the B651 at its western end via a mini roundabout and the B653 at a roundabout on its eastern end. Dyke Lane and Conquerors Hill join it from the south. As stated previously the B653 east leads to the A1 and Welwyn Garden City and in a

westerly direction leads back to the centre of Wheathampstead and the B651.

3.3 Existing Access Conditions

- 3.3.1 At present, the main vehicular access to the site is an unpaved farm track from Dyke Lane, following a public right of way, that enters the site at its south-west corner.

3.4 Walking Assessment

- 3.4.1 Drawing E3090/10, 'Footway and Cycleway Paths' provided in **Appendix C** shows the existing pedestrian and cycle network in the area surrounding the proposed site.
- 3.4.2 There are a number of pedestrian routes to access the site; several informal routes exist through the trees from Hill Dyke Road where Hill Dyke Road runs parallel to the site boundary and one following the same route as the main vehicular access (described above).
- 3.4.3 A paved footway of 2.0 metres nominal width exists along both edges of Hill Dyke Road for its entire length. The footway stretches from B651 The Hill, where it joins public footways along that road, to Dyke Lane.
- 3.4.4 Nine cul de sac roads join Hill Dyke Road along its length, all of which have footways on both sides of the carriageway that join the footway on Hill Dyke Road. In some cases the paths are set back from the edge of kerb with a grass verge in between. The cul de sac paths have widths varying between 1.40m – 2.00m.
- 3.4.5 A footway exists either side of the carriageway on Nurseries Road and connects into the footways on Hill Dyke Road. The footways have a nominal width of 1.80m. They extend the whole length of Nurseries Road before joining the footways on Caesars Road.
- 3.4.6 A number of roads join Caesars Road, all of which have footways on either one or both sides of the carriageway. They are either directly adjacent to the carriageway or are set back by a grass verge.
- 3.4.7 For the part of the B651 The Hill where the national speed limit is in place (heading south out of Wheathampstead), there is a footway on the western side of the road set back from the carriageway with a grass verge and hedgerow in between. On the eastern side of B651 The Hill for this same section there is no footway available. As a result, all pedestrians approaching from Hill Dyke Road and heading south must cross the B651 and continue along the set back path on the western edge of the B651. North of Hill Dyke Road the footway continues on both sides of the carriageway and has a nominal width of

2.0m.

- 3.4.8 Where Hill Dyke Road joins Dyke Lane the footway along Hill Dyke Road ends on the southern side. On the northern side the footway carries on adjacent to a property for approximately 30m before turning at a right angle towards Dyke Lane then ending at the carriageway of Dyke Lane. For the rest of the length of Dyke Lane there are no footways present.
- 3.4.9 There are several public right of ways near to the site shown in drawing E3090/10, 'Footway and Cycleway Paths' (**Appendix C**). There is a dedicated footway that passes through the field just south of the site. Heading eastwards the footway leads to two footways on the opposite side of Dyke Lane that go through Beech Hyde Farm and then continue on south east through countryside. Heading westwards the footway leads to a path on the opposite side of the B651 The Hill that leads north into Wheathampstead or south across some fields.
- 3.4.10 The informal footway within the site links the northern and southern boundary and follows the western boundary of the site. At its southern end, the footway joins the footway mentioned above. At its northern end it leads onto Hill Dyke Road.
- 3.4.11 Another footway in close proximity to the site is one that joins Dyke Lane on its eastern side just north of the site. From here the footway continues south and then north around the Devil's Dyke Earthwork (an archaeologically important site) before rejoining Dyke Lane further north.

3.4.12 Walking distances to facilities

- 3.4.13 The St Albans City and District Council Walking Strategy, produced in May 2009 outlines the need to promote walking in St Albans City and District. It aims to encourage more walking by achieving a number of actions set out in the document.
- 3.4.14 As the strategy covers the St Albans district, Wheathampstead is included in the strategy area.

3.5 Cycling Assessment

- 3.5.1 The St Albans City & District Cycling Map, a copy of which is provided in **Appendix D**, indicates the various cycle routes available throughout St Albans and the district as a whole.

- 3.5.2 The purpose of the map is to encourage people to choose cycling a sustainable form of transport, over using a car. The map makes residents aware of the various cycling routes available in the local area.
- 3.5.3 As can be seen from the Cycling Map as well as drawing E3090/10 'Footway and Cycleway Paths' Hill Dyke Road lies on a recommended or advisory cycle route. This route continues along Hill Dyke Road, heading eastwards from the proposed site until it meets Dyke Lane where it goes northwards to the Marford Road junction at which point the route splits; going eastwards towards Beech Hyde Lane or northwards along Sheepcote Lane which then joins National Cycle Route 57. Heading west from the site along Hill Dyke Road the route turns northwards along the B651 The Hill, then westwards along Butterfield Road, before heading southwards out of Wheathampstead, where the route splits to go south along minor country roads or west towards Harpenden.
- 3.5.4 National Cycle Route 57 starts in the northern part of Wheathampstead just east of Station Road on Mount Road and Old Waddling Lane. The route continues on a cycleway that runs adjacent to the River Lea before heading southwards towards Sheepcote Lane. This is the point at which the recommended route joins the National Cycle Route as described above. The Route continues north along Sheepcote Lane (now a dedicated cycle track) and under the Cory-Wright Way at which point it splits either continuing northwards along Sheepcote Lane or heading eastwards along the Ayot Greenway.

3.6 Public Transport Assessment

3.6.1 Bus Services

- 3.6.2 The nearest existing bus stop to the site is situated on Hill Dyke Road adjacent to the site. There are a pair of stops along this road for westbound and eastbound directions which are serviced by buses 657 and 866. A number of other bus stops are located within walking distance.
- 3.6.3 Drawing No E3090/09, 'Bus Routes' in **Appendix E** has been prepared, which shows the current bus routes, the position of bus stops and the route numbers of the relevant services.
- 3.6.4 A fuller description of the main bus services in the local area is detailed in the following paragraphs.

3.6.5 Route 657 – Uno: Redbourn – Hatfield

3.6.6 This is a regular service that operates Mondays to Fridays approximately every hour from 06:03 to 19:56. A Saturday service is operated approximately every hour between the times of 07:28 to 19:02. Finally a Sunday service is operational between the times of 09:20 to 18:49 and runs every 2 to 3 hours.

3.6.7 The service starts at Gaddesden Lane in Redbourn then stops at a number of places within Redbourn including the High Street. It then continues to Harpenden and Batford before reaching Wheathampstead where it stops near St Helens Church and then Vale Court. After leaving Wheathampstead, the service then stops at Sandridge near St Leonard's Church. It then continues towards St Albans stopping at a number of places including St Peter's Street and the Railway Station. It then heads towards Hatfield stopping at several places within Hatfield and finally terminates at Hatfield Railway Station.

3.6.8 Route 44/45 – Centrebus South: Luton – Stevenage

3.6.9 This service is a regular service that operates Mondays to Fridays approximately every 2 hours from 09:00 to 19:03. The 44 service, which operates the majority of the time, follows the B653 as it goes through Harpenden. The alternative 45 service, which runs only at 15:30 and 17:50, deviates from the B653 when going through Harpenden to the railway station before rejoining the B653 and continuing along the same route as the 44. The 44 operates on Saturday between 09:00 and 18:43. There is no service available on Sundays.

3.6.10 The 44 and 45 services start in Luton town centre opposite the railway station then stop at several stops in Luton before joining the B653 heading south-east. The service then stops at Newmill End and East Hyde along the B653 before entering Harpenden. As stated previously the 44 services continues along the B653 through Harpenden, stopping only at Batford. The 45 service deviates from the B653 heading southwards into Harpenden, stopping at a number of places including the The 'Red Cow' public house and the railway station before rejoining the B653 at Batford. Both services follow the same route from this point heading east out of Harpenden and towards Wheathampstead. The service turns northwards at Wheathampstead and stops at Blackmore End adjacent to the Broadway. Buses then stop at Kimpton, Codicote and Knebworth before heading into Stevenage. The final stop for both services is at Stevenage Bus Station.

3.6.11 Route 304 – Uno: Wheathampstead – St Albans

3.6.12 The 304 Uno service is a Sunday only service that operates between 11:20 and 17:09. and travels between Wheathampstead and St Albans.

3.6.13 The 304 sets off from Wheathampstead opposite St Helen's church. It then follows the B651 south stopping at Sandridge before entering St Albans where it stops at Lancaster Road, St Peter's Street and finally terminating at St Albans City Railway Station.

3.6.14 Route 304/305 – Centrebus South: Hitchin – St Albans – Welham Green

3.6.15 The 304/305 Centrebus South service operates a regular service between Monday and Friday from 07:00 to 18:44 running approximately every hour. There is a Saturday service that operates between 08:45 and 18:44. The 304 covers the whole route and the 305 covers some of the route. The more regular 304 service travels between Hitchin and Oaklands via St Albans and covers all the intermediate settlements between. The 305 operates from Sandridge to St Albans and finishing at Welham. There is no Sunday service available.

3.6.16 The wider covering 304 service starts at Hitchin, St Mary's Square the stops at Bancroft bay before heading south out of Hitchin along the B651. It then stops at St Ippolyts, St Paul's Walden, Whitwell, Kimpton and Blackmore End before entering Wheathampstead where it stops opposite St Helen's Church. It then carries on towards Sandridge where at this point 305 service begins starting at Lyndon Mead Hail & Ride and then carries onto St Leonard's Church. The 304/305 service continues and on to Smallford and Welham. The 305 service terminates at this point. The 304 service carries on and stops at Welham Green Railway Station before terminating.

3.6.17 Route 365/366 – Centrebus South: Hatfield – Luton/Dunstable

3.6.18 The 366 Centrebus South service operates a circular route between Monday and Friday from 07:15 to 19:29 operating approximately every half an hour. Approximately every other service covers a longer route between Hatfield and Luton, the other times the bus travels a shorter route between Hatfield and Welwyn Garden City. The 365 service only operates a regular route between 17:05 and 18:26 Monday to Fridays following the same route as the 366 with the exception of starting at the Forum in Hatfield rather than starting in South Hatfield. There is a Saturday service provided by the 366 that operates between 07:32 and 19:10 following the same Monday to Friday route (with every other service

travelling the longer route between Hatfield and Luton) with the exception of the Hatfield Business Park. This service operates approximately every hour. There is no Sunday service.

3.6.19 The 366 service starts in South Hatfield near Millwards and continues northwards into Welwyn Garden City where it terminates. The longer service continues westwards out of St Albans towards Wheathampstead, stopping at Lemsford on the way. At Wheathampstead the service stops at St Helen's Church before continuing to Harpenden. The service then calls at Batford and a number of places in Harpenden and Luton before terminating at Luton Town Centre, Church Street. The 365 service as stated previously follows the same route as the 366; however it only operates between 17:05 and 18:26 Monday to Fridays and starts at the Forum in Hatfield rather than South Hatfield.

3.6.20 The 366 returns to South Hatfield in the afternoon following the route as mentioned previously.

3.6.21 Route 636 – Uno: Luton – Hatfield – London Colney

3.6.22 The 636 service runs Mondays to Fridays between the hours of 07:00 and 20:32 between Luton and London Colney via Hatfield. There is an earlier service that starts at 06:15 and just runs between Hatfield Business Park and London Colney. There is also a late service that starts at 20:54 and finishes at 01:37, that again only goes between Hatfield Business Park and London Colney. There is no service on Saturdays or Sundays.

3.6.23 The service starts from Luton Town Centre, opposite Luton Railway Station. From here the bus calls at a number of stops in Luton before heading south out of Luton and travelling along the A1081 towards Harpenden. It stops at Marshalls Heath on the way to Wheathampstead where it stops at St Helens church in Wheathampstead before carrying on eastwards towards Hatfield. From Hatfield, the service heads towards London Colney where it finally terminates at Sainsbury's, London Colney. The earlier and later services take the same route however they starts at Hatfield Business Park before terminating at Sainsbury's, London Colney.

3.6.24 Route 657 – Arriva the Shires & Essex: Wheathampstead – St Albans

3.6.25 The 657 service runs in the evenings from Monday to Saturday between the times of 20:31 to 22:50. There is no Sunday service.

3.6.26 The 657 bus starts at Wheathampstead opposite St Helen's Church. The service it continues southwards towards St Albans stopping at Sandridge along the way. In St Albans the service stops adjacent to Lancaster Road and St Peter's Street before terminating at St Albans City Railway Station. The Saturday service follows the same route.

3.6.27 Route 866 – Centrebus South: Wheathampstead – Roundwood Park School

3.6.28 The 866 runs Monday to Fridays between the times of 07:50 to 08:18. There is no Saturday or Sunday service.

3.6.29 The service starts at Wheathampstead opposite the Vale Court, it then goes to St Helen's Church bus stop before leaving Wheathampstead and heading towards Harpenden. On the way to Harpenden the service stops at Marshalls Heath. In Harpenden the service stops at Harpenden Railway Station and The George pub before terminating at Roundwood Park School.

3.6.30 Route E446 – Reg's of Hertford: Kimpton – St Albans Girls School

3.6.31 The E446 is a school bus that runs Monday to Friday between the times of 07:30 to 08:20 and 15:40 to 16:18.

3.6.32 The morning service starts on Kimpton High Street before stopping at Blackmore End and Gustardwood on its way to Wheathampstead. In Wheathampstead it stops at a number of places before terminating at St Albans Girls' School. The afternoon service follows the same route in the opposite direction stopping at all the same stops starting from St Albans Girls' School.

3.7 Rail Links

3.7.1 The nearest railway station to the site is Harpenden Railway Station, located near the centre of Harpenden. It is approximately 4.40km west of the proposed site. The station is on the Bedford to Brighton Line and provides a fast link to London, taking approximately 25 minutes to get to St Pancras International. The railway also heads northwards to Luton, calling at Luton Airport before continuing to Bedford. There are trains available which also stop at all the intermediate stops between Harpenden and London. Bus services 45, 366, 636 and 866 all stop at Harpenden Railway Station.

3.8 Existing Traffic Flows on Links and Junctions within the Study Area

3.8.1 PCC Traffic Information Consultancy Ltd undertook classified turning counts for a weekday period between 07:00 – 19:00. These counts were undertaken on Tuesday 27 November 2012 at the junctions listed in **Table 3A** below:

Table 3A: Traffic Count Locations

Location	Type	Description
1	T-junction	Butterfield Road/B651 The Hill
2	T-junction	Hill Dyke Road/B651 The Hill
3	T-junction	Nurseries Road/Hill Dyke Road
4	T-junction	Hill Dyke Road/Dyke Lane
5	T-junction	Nurseries Road/Caesars Road
6	Cross roads	Marford Way/Dyke Lane/Sheepcote Lane

3.8.2 The peak hour traffic flows for 2012 are summarised in Drawing Numbers E3090/12&13, in **Appendix F**.

3.8.3 In order to test the existing traffic conditions in the network, junctions at locations 1, 2 and 6 were modelled using the PICADY computer software package for the weekday AM and PM peak hours. These junctions were modelled as they all have a significant demand on them. A summary is contained in the following paragraphs and the full results of the PICADY analysis can be obtained from WBPL.

3.8.4 The results for Junction 1 the Butterfield Road/B651 The Hill junction, are summarised in **Table 3B** below:

Table 3B: Junction 1: Butterfield Road/B651 The Hill

Period (peak hour)	RFC Value	Max Queue (vehicles)	Max Delay (min)
Weekday AM	1.053	18.16	2.80
Weekday PM	0.157	0.19	0.17

Note: RFC is the ratio of demand flow to capacity (maximum flow rate of traffic) on an arm of junction, generally 0.85 being recommended as maximum.

3.8.5 The results for Junction 2 B651 The Hill Dyke Road/B651 The Hill junction, are summarised in **Table 3C** below:

Table 3C: Junction 2: Hill Dyke Road/B651 The Hill

Period (peak hour)	RFC Value	Max Queue (vehicles)	Max Delay (min)
Weekday AM	0.192	0.24	0.20
Weekday PM	0.127	0.15	0.16

3.8.6 The results for Junction 6 the Marford Way/Dyke Lane/Sheepcote Lane junction, are summarised in **Table 3D** below:

Table 3D: Junction 6: Marford Way/Dyke Lane/Sheepcote Lane

Period (peak hour)	RFC Value	Max Queue (vehicles)	Max Delay (min)
Weekday AM	0.267	0.36	0.23
Weekday PM	0.081	0.09	0.18

3.8.7 The modelling results show that Junctions 2 and 6 currently have ample capacity with the RFC values for both junctions under the recommended 0.85 value for both AM and PM periods.

3.8.8 However the modelling showed that at Junction 1, Butterfield Road/B651 The Hill, current demand in the AM peak is greater than capacity. In the PM peak period, the junction has ample capacity. Inspection of the PICADY results shows that the RFC values are above the recommended 0.85 for the time period of 08:15AM to 08:45AM. The modelling shows that the least capacity is on the Butterfield Road approach, with this traffic trying to turn onto B651 The Hill during this time.

3.8.9 The operation of Junction 1 was verified by a site visit on 26 March 2013 to observe the morning traffic between 07:45 and 09:15 AM. The observations are summarised in the **Table 3E** below:

3.8.10 Table 3E: Junction 1 (Butterfield Road/B651 The Hill) Observations

Time Period	Observations
07:45 to 07:50	Light traffic with car queues between 0 to 2.
07:50 to 07:55	Junction becoming slightly busier with queues of 0 to 5 vehicles. However, these are sporadic and junction is mostly clear of queuing vehicles. Vehicles queuing for no more than 10-15 seconds.
07:55 to 08:00	A queue of 7 vehicles occurred. However it soon dissipates.
08:00 to 08:05	No additional traffic load observed. Still free flowing with minimal/non existent queues.
08:05 to 08:10	The junction starts to become busier especially as more vehicles approach from Butterfield Road. Queuing of up to 5 vehicles occurring. These are having to wait for approximately 30 seconds before continuing on.
08:10 to 08:15	Quick build up of a 10 vehicle queue. The vehicles waiting no longer than 30 seconds. Towards the end of the period, the queue builds up to 15 vehicles, queuing back to Wick Avenue. This queue completely dissipates at the end of the period as a lull in traffic is observed.
08:15 to 08:20	Queuing of 5 to 6 vehicles is observed at the start of the period this generally persists until towards the end of the period when queues build up to 10 to 15 vehicles.
08:20 to 08:25	The start of the period sees the same queuing of up to 10 to 15 vehicles. This increases to 15-20 vehicles building up towards Wick Avenue. It is observed during this high amount of traffic that 5-6 vehicles at a time are able to get out of the junction when there is a gap in the traffic on B651 The Hill. The end of the period sees vehicle queuing reduced to 10 to 15 vehicles once again.
08:25 to 08:30	Queuing of 10 to 15 cars again. Vehicles usually waiting 40-60 seconds. There is a reduction in traffic towards the end of the period.
08:30 to 08:35	Another lull in the traffic occurs with only 3 to 4 vehicles queuing at a time. The queue disappears quickly due to 5 to 6 vehicles at a time being able to turn onto B651 The Hill. At the end of the period there are no queues.
08:35 to 08:40	Queues of 4 to 5 vehicles are observed with a wait time of approximately 10 to 15 seconds. These conditions persist for the length of the period.
08:40 to 08:45	Similar conditions to the previous period with maximum

Time Period	Observations
	queuing of 4 to 5 cars. These tend to disappear quickly with the junction being clear some of the time.
08:45 to 08:50	Queuing is intermittent and when it does happen there, are generally only 2 to 3 vehicles.
08:50 to 08:55	Little queuing with a maximum of 4 vehicles queuing for no more than 20 seconds.
08:55 to 09:00	A maximum queue length of 2 to 3 vehicles is observed.
09:00 to 09:05	Little queuing is observed.
09:05 to 09:10	The period is similar to the previous 5 minutes.
09:10 to 09:15	No queuing with minimal traffic load on the junction.

3.8.11 The on-site observations, confirm that queuing is occurring along Butterfield Road. However, the existing delays do not seem to be as great as the PICADY model predicts. There was a busy period of 20 minutes between 08:10 and 08:30 where long queuing occurred. However, this fluctuated throughout the period with long queuing appearing and then disappearing very quickly. Nevertheless, slow moving vehicles did queue along Butterfield Road up to Wick Avenue suggesting that the junction is at capacity for some of the AM peak period. Therefore some mitigation measure may be appropriate. This issue will be referred to later in the report.

3.9 Speed Survey

3.9.1 A vehicle speed survey was undertaken at The Hill by WBPL on 1st May 2013 in accordance with TA22/81 at four locations, two northbound and two southbound, near the junctions of Hill Dyke Road and Butterfield Road. The results of the survey are shown in **Table 3F** and copies of the full data sheets can be supplied by WBPL if required. The weather conditions at the time of the study were clear, dry and sunny.

Table 3F: B651 The Hill Speed Survey Results

Direction	Location	Average Speed (mph)	85 th %ile Speed (mph)
Northbound	20m north of Hill Dyke Road	32.9	37.0
Northbound	35m south of Hill Dyke Road	34.2	38.0
Southbound	At the junction of Hill dyke Road	32.8	37.0
Southbound	20m south of Butterfield Road	33.2	37.7

- 3.9.2 The results determine that the 85th percentile speed in both directions on The Hill by Hill Dyke Road and Butterfield Road are above the Association of Police Officers (ACPO) threshold speed of 35mph in a 30mph limit (as referenced in HCC's Highways and Transport Speed Management Strategy, November 2009).

3.10 Personal Injury Accident Records

- 3.10.1 Hertfordshire County Council has supplied non-confidential personal injury accident data of the study area that covers the five year period from August 2007 to July 2012.
- 3.10.2 Two accidents were recorded in the study area during the five year period with none of the accidents being fatal, one being serious and one being slight. One accident involved two cars and the other involved a car and a medium goods vehicle.
- 3.10.3 An inspection of the accident plot locations indicates that both accidents occurred on B651 The Hill, just after the speed limit changes from the national speed limit to 30mph.
- 3.10.4 The first accident involved a medium goods vehicle and a car. The car, travelling from Wheathampstead, hit a parked goods vehicle causing the driver of the goods vehicle serious injuries in the process.
- 3.10.5 The second accident involved two cars, a vehicle from Butterfield Road turning left at the T junction with B651 The Hill collided with a vehicle travelling north along B651 The Hill.
- 3.10.6 The number of accidents in the study area is statistically very low with no common cause apparent in the two recorded accidents.

3.11 Committed Developments

- 3.11.1 There are no committed developments within Wheathampstead.

4 PROPOSED DEVELOPMENT

4.1 Introduction

4.1.1 Taylor Wimpey Developments Limited propose the building of up to 100 dwelling units on land south of Hill Dyke Road, Wheathampstead.

4.1.2 *Layout of development TBA.*

4.1.3 Road Layout

4.1.4 *Development road layout TBA.*

4.1.5 The proposed vehicular access from Hill Dyke Road will be located approximately 200m south west of B651 The Hill Dyke Road/Dyke Lane junction. This location allows sufficient offset from other side roads onto Hill Dyke Road and achieves the required minimum visibility splay.

4.2 Parking

4.2.1 The Hertfordshire County Council require that all matters regarding to parking are to be handled by the relevant planning authority. Wheathampstead's planning authority is St Albans District Council. Therefore parking allocation for each dwelling will need to be in accordance with 'City and District of St Albans District Local Plan Review 1994'.

4.3 Proposed Access Arrangements

4.3.1 Vehicular Access

4.3.2 The main and only vehicular access will be from Hill Dyke Road. This will be in the form of a simple priority T-junction. The access road will be in the form of a 5.5m wide major access road with 2.0m wide footways.

4.3.3 Pedestrian and Cycle Access

4.3.4 Pedestrian access to the site is provided at four points, three from Hill Dyke Road including alongside the vehicular access and one from the right of way south of the site.

4.3.5 One pedestrian access point from Hill Dyke Road is located 270m east of the junction with The Hill adjacent the existing bus stop. The other access point onto Hill Dyke Road is approximately half way between this link and the vehicular access.

4.3.6 The third access point links to the right of way running south of the site and provides access to the south and east, and also to The Hill.

4.3.7 Cycle access can also be achieved via the vehicular access.

4.4 Construction Traffic

4.4.1 Construction traffic attending the site will include:

- Site staff and contractors staff travelling to work,
- Deliveries of plant and equipment,
- Deliveries of materials; and
- Removal of surplus excavated materials, if required.

4.4.2 The estimated total construction period for the whole development is approximately four years.

4.4.3 Site staff will typically travel to and from the site on weekdays; arriving between 0700 and 0800 and leaving between 1700 and 1800 depending on the time of year and the weather conditions.

4.4.4 Deliveries will occur at intervals throughout the working day and the total number of deliveries per day could typically be between 15 to 25 vehicles at the height of operations. The most intensive period of movement for HGVs is likely during the placement of road base materials, when there could be up to around half a dozen trucks within short periods of the day.

4.4.5 It is anticipated that the site will be designed to achieve a cut/fill balance and, therefore, little excavated material will need to be taken off site. However, if the removal of unsuitable excavated material were to become necessary, this would generate a few truck movements for relatively short periods during construction.

4.4.6 To ensure that vehicles do not inconvenience residents in surrounding streets, adequate parking for construction vehicles will be provided on site.

5 APPRAISING THE IMPACT OF THE PROPOSED DEVELOPMENTS

5.1 Accessibility

- 5.1.1 The proposed residential development on the land south of Hill Dyke Road includes access points to Hill Dyke Road for vehicular, foot and cycle traffic. These links allow access to Wheathampstead and to the surrounding area using the B651 to the east and the B653 to the west.
- 5.1.2 A pedestrian access point is also provided to the south to a network of public rights of way and lanes over rural countryside.
- 5.1.3 The vehicular traffic generated by the site is expected to follow current travel patterns as found from the classified turning counts and census data. The Trip generation and its distribution are determined in **Section 8** of this report.
- 5.1.4 All residents of the development are within the 400m walking distance of the two existing bus stops on Hill Dyke Road. The proposed footpath also joins the existing footway on Hill Dyke Road adjacent to where the westbound bus stop is located.
- 5.1.5 Residents of the proposed development can easily access the village centre by walking or cycling.
- 5.1.6 A recent 'Statistical Release' document published by the DfT on 24 July 2014 titled 'National Travel Survey: England 2013' states that "of all trips made in 2013, 18% were less than one mile in length, 67% less than 5 miles and 95% were less than 25 miles."
- 5.1.7 Chart 4: Mode share – average number of trips by main mode and distance: England, 2013 [NTS0308] of the above-mentioned document indicates that 78% of these trips under 1.0 mile (1.6 kilometres) were made by foot.
- 5.1.8 It is clear that, considering its close proximity to facilities that are within 1.6 kilometres (1 mile) of the site, a large number of journeys from the site could be made on foot or by bicycle. Therefore, the proposed residential development, with its easy access to footways, has the potential to equal (or even better) the figures used in the National Travel Survey.
- 5.1.9 To access the nearest railway station residents must travel to Harpenden which is approximately 5km west of the site. This can be accessed by car using the previously

mentioned B651 and B653 roads, or by bus. Residents can also cycle.

5.2 Safety

- 5.2.1 In the last five years, two Personal Injury accidents were recorded along B651 The Hill, one occurring at the junction with Butterfield Road and the other along B651 The Hill itself. The slight injury occurred at the Butterfield Road/B651 The Hill junction and the serious injury occurred on B651 The Hill.
- 5.2.2 Considering the total traffic flow in the network and the time period, the number of accidents is statistically very low.
- 5.2.3 The development will add some traffic to the surrounding road network. However, the proportion is comparatively small compared to that which currently exists. Maintaining the current good safety record has to be an objective of the proposed development.

5.3 Economy

- 5.3.1 The proposed development will be built in accordance with “Hertfordshire County Council 3rd Local Transport Plan 2011-2031” which states a number of goals, one being to support economic development and planned dwelling growth. This goal will therefore be addressed and incorporated into the development.
- 5.3.2 The reliability of vehicular journey time within the local network is analysed in **Section 8**, walking and cycling network is assessed in **Section 3**, and the site’s links to these networks are described in **Section 4**.

5.4 Environment

- 5.4.1 The Land South of Hill Dyke Road development is located close to facilities as shown in drawings E3090/07&08, ‘Facilities Plan’ and ‘Facilities near the site’ in **Appendix A**. Many of the facilities and centre of Wheathampstead are within 1.0 kilometre (0.39 miles) and are therefore within easy walking distance of the site.
- 5.4.2 This includes two primary schools that are located within 1.0 kilometre of the proposed site. Such close proximity will encourage children to walk to school rather than be driven, thus reducing the vehicular trips to and from the site.
- 5.4.3 Secondary schools are located within towns surrounding Wheathampstead. The bus services that stop on Hill Dyke Road provide a means for pupils to reach schools in neighbouring towns. A school bus route E446 also stops in Wheathampstead on its way
-

to St Albans Girls School.

- 5.4.4 The site is on a recommended cycle route. This should help to encourage residents to cycle to their destination rather than using their cars.
- 5.4.5 The site is therefore sustainably located, which naturally encourages walking and cycling. This not only brings about health benefits for those who partake in it, but can significantly reduce the use of motorised transport. The connectivity of the site, and the accesses to it, serve to encourage sustainable transport even further.

5.5 Integration

- 5.5.1 The site is in a location that will allow it to readily integrate into Wheathampstead established existing transport links.
- 5.5.2 There are a total of three existing primary schools considered to be within easy walking distance of the proposed development; these trips should be accompanied where necessary as part of a safe routes to school initiative.
- 5.5.3 The development provides access for all transport modes. Walking and cycling links are accommodated while motorised journey reliability has been assessed in this report in Section 8 to ensure it remains acceptable.
- 5.5.4 The close proximity of the existing bus stop on Hill Dyke Road means the residents of the site can readily make use of existing public transport.

6 ASSESSMENT YEARS AND TRAFFIC GROWTH

- 6.1.1 It is anticipated that the development will commence construction in 2015 with a significant number of dwellings being occupied by 2016.
- 6.1.2 To provide a robust analysis on the road network, 2016 is therefore the assessment base year.
- 6.1.3 Trips generated using the TRICS database for the proposed development will be tested from this base year. In reality, full occupation of the development will not occur by the end of 2016. However, by testing the network in 2016 while assuming that all houses are occupied by 2016 will give prudent robustness to the analysis.
- 6.1.4 A horizon year of 2021 was chosen, this being five years after the development has been built and therefore a reasonable year to assume that all houses would be occupied.
- 6.1.5 In order to project the traffic volumes at the junctions for 2016 and 2021, traffic growth factors were determined using the TEMPRO version 6.2 computer software package developed by the Department for Transport with the National Trip End Model (NTEM) forecasts (dataset 6.2) and local adjustment from National Transport Model (NTM) 2009.
- 6.1.6 The resulting growth factors for the surrounding road network are detailed in **Table 6A** below:

Table 6A: Traffic Growth Factors

Period	Growth
2012 to 2016 AM weekday	1.0411
2012 to 2016 PM weekday	1.0391
2012 to 2021 AM weekday	1.1123
2012 to 2021 PM weekday	1.1075

7 ANALYSIS PERIOD

- 7.1.1 It was determined from the traffic counts that the weekday vehicular peak hour periods on the local road network occur at 0800 to 0900 in the morning and 1700 to 1800 in the evening.
- 7.1.2 The traffic counts indicate that the period of greatest demand on the local road network is between 0800 and 0900 during the weekday morning.
- 7.1.3 The assessment periods that reflect the trip generation of the development of the proposed site used in this report are therefore:
- 0800 – 0900 AM (weekday)
 - 1700 – 1800 PM (weekday)

8 DEVELOPMENT TRIP GENERATION

8.1 Calculated Vehicular Trip Generation

8.1.1 The number of vehicle trips generated by a housing development is influenced by a variety of factors, the main one being the location of the site and its relation to the availability of local facilities such as schools, retail, employment, leisure facilities and the level of existing transport facilities. The generation of vehicle trips can be highly localised and specific to certain developments.

8.1.2 It was therefore considered that an appropriate prediction of vehicle trips from the proposed development would be determined by using the TRICS database and utilising only the surveys from this database that represent similar sites to Land South of Hill Dyke Road, as well as taking into account all the factors mentioned above.

8.1.3 The TRICS database (TRCIS 2013 (a) v6.11.1) analysis resulted in the following vehicular trips rates for the whole development at the network peak times. The full results of the analysis can be obtained from WBPL.

	In	Out
AM Peak Hour 0800 - 0900	0.156	0.446
PM Peak Hour 1700 - 1800	0.419	0.252

8.1.4 The number of dwellings proposed is 100. However, the vehicular assessment will be undertaken for 200 dwellings. This provides a robust analysis. For 200 dwellings, the resulting number of trips are as follows:

	In	Out
AM Peak Hour 0800 - 0900	31	89
PM Peak Hour 1700 - 1800	84	50

8.1.5 Trip Distribution

8.1.6 In order to determine the distribution of the generated trips on the existing network a number of information sources were used: existing classified turning count traffic surveys, Office of National Statistics (ONS) Census Data, as well as the location of facilities in the local area.

- 8.1.7 For the generated trip departures in the AM peak and the trip arrivals in the PM peak, it was assumed that the greatest reason to travel would be for work to a lesser degree and school related journeys. In order to distribute the generated trips to model this behaviour, the 2001 ONS census data was used. The locations of where people from the ward of Wheathampstead go to work was extracted from the census data. This also included trips for taxis, cars, motorcycles and bicycles. This data was used to produce a map showing the locations and proportions of where people go to work. From this, the likely routes that people took to work was determined and the trips were distributed accordingly.
- 8.1.8 For the trip arrivals in the AM peak, it was assumed that the reason for travel would be people returning from shops, walking their dogs, school runs or similar local use of facilities. Therefore these trips would generally be local and therefore the distribution of the trips was determined by looking at the location of local facilities and the likely routes people would take to access them. Drawings E3090/08&09 'Facilities Plan' and 'Facilities near the site' in **Appendix A** show the facilities within walking distance of the site.
- 8.1.9 For the trip departures in the PM peak, it was assumed the main reasons for travelling would be to access social and recreational facilities, and shops such as the supermarkets. In a similar way to the AM peak arrivals by looking at the location of these facilities, the generated trips could be distributed by looking at the likely routes people would travel to get to these facilities.
- 8.1.10 Drawings E3090/14&15 in **Appendix F** show the distribution of the development AM Flows and PM flows respectively on the surrounding network.

9 TRANSPORT IMPACTS AND MITIGATION MEASURES

9.1 Vehicular Traffic Impact

- 9.1.1 The junctions identified in Section 3 as forming the local network around the proposed site, and therefore the junctions most likely to be impacted upon by vehicles generated by the development, were analysed in sub-section 3.7 to determine their current performance. It was determined that while the Junctions 2 and 6 have ample capacity Junction 1 was already at capacity for a period in the AM peak. This was confirmed by site observations.
- 9.1.2 To assess the effect the vehicular trips generated by the new housing development will have, Junctions 1, 2 and 6 were remodelled using projected traffic flows for the Base Year and Horizon Years and the predicted development flows. The modelling was undertaken using PICADY software.
- 9.1.3 The site access junction with Hill Dyke Road was also tested.
- 9.1.4 The models were tested during the time periods as follows, which match the peak periods as identified in Section 3:
- 0800 – 0900 AM weekday peak
 - 1700 – 1800 PM weekday peak
- 9.1.5 For the peak hours, the junctions were assessed for the traffic flows generated by each of the scenarios as follows:
- 2016 Base Year: the surveyed flows growthed to 2016 (according to paragraph 6.1.6).
 - 2016 Base Year inc Dev: the surveyed flows growthed to 2016 plus the site development flows.
 - 2021 Horizon Year: the surveyed flows growthed to 2021.
 - 2021 Horizon Year inc Dev: the surveyed flows growthed to 2021 plus the site development flows.
- 9.1.6 The following paragraphs in this section summarise and expand upon results from the PICADY analysis modelling undertaken for all of the above scenarios. The full set of results can be obtained from WBPL.

9.2 Results Summary and Discussion

9.2.1 Junction 1: The Hill/Butterfield Road

9.2.2 A summary of the PICADY results of the AM Peak and the PM Peak analysis are shown in the following two tables:

Table 9A: Junction 1: AM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	1.053	18.16	3.12
2016 Base Year	1.122	26.90	4.21
2016 Base Year inc Dev	1.148	30.19	4.67
2021 Horizon Year	1.254	46.25	7.60
2021 Horizon Year inc Dev	1.285	50.27	8.50

Table 9B: Junction 1: PM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	0.157	0.19	0.17
2016 Base Year	0.165	0.20	0.18
2016 Base Year inc Dev	0.204	0.25	0.19
2021 Horizon Year	0.181	0.22	0.18
2021 Horizon Year inc Dev	0.221	0.28	0.20

Note: RFC is the ratio of demand flow to capacity (maximum flow rate of traffic) on an arm of a junction.

9.2.3 The development is predicted to add minimal traffic to the junction: four vehicles (0.6%) to the flows from Butterfield Road and 36 (2.2%) overall in the AM Peak. The modelling determines that this will add additional queuing of two vehicles in 2016 and four in 2021

9.2.4 These results show that even with its current demand, before the development is undertaken, the junction is at capacity during the AM peak. The PM model shows that the junction has ample capacity for the present demand as well as for the future Horizon Year demand for this time period.

9.2.5 Site observations on 26 March 2013, as mentioned in paragraph 3.8.9, provided more information on the operation of the junction. Most vehicles were seen to be queuing

between 40 to 60 seconds during the 'peak' of the morning peak. The queuing also fluctuated greatly with queues forming and then dissipating quickly.

9.2.6 HCC believe there to be excessive speeding along The Hill and requested that a roundabout is constructed at the junction with Hill Dyke Road to act as a traffic calming feature. The speed survey undertaken at The Hill (see Section 3.9) confirmed this with the 85th percentile speeds near the junctions of Butterfield Road and Hill Dyke Road in both directions being measured as above 35mph. This can make exiting from Butterfield Road onto The Hill difficult, which increases the delays to Butterfield Road traffic to a greater extent than if the main road speeds were within the speed limit.

9.2.7 A roundabout was therefore considered at the junction of The Hill with Hill Dyke Road. HCC confirmed that if this roundabout is constructed, no modifications to Butterfield Road would be required as mitigation for the development.

9.2.8 Junction 2: Hill Dyke Road/B651 The Hill

9.2.9 A summary of the PICADY results of the AM Peak and the PM Peak analysis are shown in the following two tables:

Table 9C: Junction 2: AM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	0.192	0.24	0.20
2016 Base Year	0.203	0.25	0.21
2016 Base Year inc Dev	0.268	0.36	0.24
2021 Horizon Year	0.224	0.29	0.23
2021 Horizon Year inc Dev	0.295	0.41	0.26

Table 9D: Junction 2: PM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	0.127	0.15	0.16
2016 Base Year	0.133	0.15	0.16
2016 Base Year inc Dev	0.174	0.21	0.17
2021 Horizon Year	0.142	0.16	0.16
2021 Horizon Year inc Dev	0.184	0.22	0.18

9.2.10 The results show that with the demand from growthed background flows and the addition of the development traffic by 2021, there is still ample capacity at the junction for both the AM and PM peak.

9.2.11 To reduce the excessive speeds of vehicles along The Hill, especially those entering Wheathampstead, a roundabout was considered at this junction. Insufficient area of highways land exists at the junction for the construction of a standard roundabout. However, a mini-roundabout is possible. A drawing of the proposed roundabout is shown in Drawing E3090/37 in **Appendix G**. The junction was remodelled using ARCADY.

9.2.12 A summary of the ARCADY results of the AM Peak and the PM Peak analysis are shown in the following two tables. The full results can be obtained from WBPL.

Table 9E: Proposed Roundabout at Junction 2: AM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2016 Base Year inc Dev	0.81	4.24	0.40
2021 Horizon Year inc Dev	0.87	6.35	0.57

Table 9F: Proposed Roundabout at Junction 2: PM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2016 Base Year inc Dev	0.54	1.16	0.14
2021 Horizon Year inc Dev	0.57	1.33	0.15

9.2.13 As can be seen from the results, the proposed mini roundabout has sufficient capacity for the predicted traffic demand in 2021.

9.2.14 Junction 6: Marford Way/Dyke Lane/Sheepcote Lane

9.2.15 A summary of the PICADY results of the AM Peak and the PM Peak analysis are shown in the following two tables:

Table 9G: Junction 6: AM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	0.192	0.24	0.20
2016 Base Year	0.203	0.25	0.21
2016 Base Year inc Dev	0.268	0.36	0.24
2021 Horizon Year	0.224	0.29	0.23
2021 Horizon Year inc Dev	0.295	0.41	0.26

Table 9H: Junction 6: PM Weekday Peak Hour

	RFC Value	Max Queue (vehicles)	Max Delay (min)
2012 Existing	0.192	0.24	0.20
2016 Base Year	0.203	0.25	0.21
2016 Base Year inc Dev	0.268	0.36	0.24
2021 Horizon Year	0.224	0.29	0.23
2021 Horizon Year inc Dev	0.295	0.41	0.26

9.2.16 From the results, it can be seen that for both the AM and PM peak periods the junction has ample capacity for the demand from the growthed traffic and the development flows up to the Horizon year. Therefore, no modifications are required at the junction.

9.3 Heavy Vehicles

9.3.1 The development once complete will generate mainly private car vehicular traffic as well as light vehicle traffic for deliveries, maintenance and refuse collection.

9.3.2 Bus services will not operate through the development. A bus route is in existence just outside the development along Hill Dyke Road within walking distance to all of the dwellings as described in Section 3.6.

9.4 Network Model and Summary of Vehicular Traffic Impact

9.4.1 The traffic modelling analysis demonstrates that the network generally has ample capacity to accommodate growth and the predicted traffic generated by the development

in 2021. The only exception is the junction of the B651 The Hill with Butterfield Road in the morning peak hour. The percentage of traffic the development will add to this junction is however predicted to be minimal and it is growth rather than the development per se that gives rise to increased queuing and delay.

9.4.2 Eighty-fifth percentile speeds of vehicles in both directions along B651 The Hill were determined to be greater than the Association of Police Officers (ACPO) threshold speed of 35mph so pointing out the desirability for a degree of traffic calming as provided by the mini roundabout.

9.4.3 Mitigation Measures

9.4.4 Mitigation measures proposed are primarily in the form of sustainable transport measures that will ensure that the number of trips made by unsustainable means (i.e. private car) are minimised.

9.4.5 The basis for these measures will come from the Travel Plan (STP) for the site, which will aim to encourage trips to and from the site by sustainable means. The plan is site-specific and will therefore be aimed at the needs of both the Lodge Farm site and the local community around it.

9.4.6 Infrastructure provided along with the development is designed to support the Travel Plan and its aims.

9.4.7 A roundabout at Hill Dyke Road is proposed to reduce vehicle speeds on B651 The Hill, especially of vehicles entering Wheathampstead from the south. The introduction of a roundabout to reduce speeds on The Hill is supported by HCC.

9.4.8 The operation of the junction of The Hill with Butterfield Road will be aided by the construction of the roundabout. This roundabout will reduce speeds of vehicles along The Hill, making it easier for vehicles to turn out of Butterfield Road.

10 CONCLUSIONS

- 10.1.1 The proposed housing development of up to 100 dwellings will require off site highway works in the form of a mini-roundabout constructed at the junction of B651 The Hill with Hill Dyke Road. This is required to alleviate excessive speeding that currently occurs on The Hill and to improve the operation, capacity and safety of the junctions of Hill Dyke Road and of The Hill with Butterfield Road.
- 10.1.2 The main vehicular access to the proposed development will be from Hill Dyke Road in the form of a priority T junction.
- 10.1.3 No other off-site highway works are required on the local road network in the study area.
- 10.1.4 The main development access road has been designed with a width of 5.5 metres and footways along each side, these having a width of 2.0m.
- 10.1.5 The existing pair of bus stops on Hill Dyke Road are within the required 400m walking distance to each dwelling in the development.
- 10.1.6 Transport links within the site will be in accordance with Hertfordshire County Council's Local Transport Plan 2011-2031 and related daughter documents.
- 10.1.7 Pedestrian and cycle accesses to the site is provided at four points: three from Hill Dyke Road, including the vehicular access, and the other to a public footpath south of the site. These access points link to the surrounding cycleway and footway network, and allow foot and cycle travel to and from the site in all directions.
- 10.1.8 The St Albans City and District Council 'Local Plan Review' will determine the car parking allocation for each dwelling.
- 10.1.9 In conclusion, the proposed development of up to 100 units of housing is easily accommodated both in terms of sustainability; with the site being located close to facilities and having ready access to non-car modes of transport, and also in terms of the overall traffic capacity of the local road network after the mini roundabout improvement works are undertaken. Therefore, just the one improvement is required at the B651 The Hill/Hill Dyke Road Junction in addition to the construction of the proposed access.

APPENDICES

APPENDIX A

