

Woodcroft Farm, Havant

Transport Assessment

On behalf of

The logo for Grainger features the word 'grainger' in a bold, dark blue font.

Project Ref: 21834/020 | Rev: AA | Date: July 2013



Document Control Sheet

Project Name: Woodcroft Farm, Havant
Project Ref: 21834/020
Report Title: Transport Assessment
Doc Ref:
Date: July 2013

	Name	Position	Signature	Date
Prepared by:	Adam Coleman	Senior Engineer		
Reviewed by:	Dan Townsend	Engineer		
Approved by:	Sarah Matthews	Director of Transport Planning		
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Peter Brett Associates LLP disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Peter Brett Associates LLP accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Peter Brett Associates LLP 2013

Contents

1	Introduction	1
1.1	Background	1
1.2	Proposed Development.....	1
1.3	Consultation with Hampshire County Council & Highways Agency	1
2	Policy Review	2
2.1	Introduction	2
2.2	National Planning Policy Framework.....	2
2.3	Local Policy: Hampshire Local Transport Plan 2011 - 2031	4
2.4	Local Policy: Havant Borough Core Strategy: Local Development Framework (Adopted March 2011).....	5
2.5	Summary	8
3	Baseline Conditions: Access and Movement	10
3.1	Introduction	10
3.2	Site Location	10
3.3	Acceptable Walking & Cycling Distances.....	10
3.4	Local and Strategic Access and Movement – Access to Amenities	10
3.5	Footway and Cycleway Network	13
3.6	Public Transport	14
3.7	Local Highway Network.....	16
3.8	Woodcroft Primary School Trip Survey	16
4	Baseline Conditions: Road Network Characteristics	18
4.1	Introduction	18
4.2	Baseline Traffic Flows	18
4.3	Junction Assessment Results (Observed Traffic Flows).....	21
4.4	Vehicle Collision Records.....	23
5	Development Proposals	29
5.1	Development Scheme	29
5.2	Pedestrian & Cycle Access	29
5.3	Cycle Parking Provision	30
5.4	Vehicle Access	30
5.5	Internal Vehicle Access Arrangement	31
5.6	Car Parking Provision.....	31
6	Development Impact Assessment.....	33
6.1	Introduction	33
6.2	Agreed Development Trip Generation.....	33
6.3	Development Traffic Distribution	34
6.4	Development Traffic Distribution – Method 1: Observed Flows.....	35
6.5	Development Trip Distribution – Method 2: Census Data	36
6.6	Development Trip Distribution – Agreed Approach.....	38

6.7	Development Traffic Assignment	38
6.8	Network Assessment Methodology	40
6.9	Link Impact	40
6.10	Local Network Junction Assessment.....	43
6.11	Site Access Junction Operation	46
6.12	A3(M) Assessment (Junctions 2 & 3)	46
7	Identification of Impacts and Mitigation Measures.....	51
7.1	Travel Plan Measures	51
7.2	Junction / Network Improvements	52
8	Conclusion.....	53

Figures

Figure 1.1	Site Location (Strategic Level)
Figure 3.1	Site Location (Local Area)
Figure 3.2	Local Facilities
Figure 3.3	Walk and Cycle Distances to Costcutter Store (Wednesday 23/06/10)
Figure 3.4	Walk and Cycle Distances to Costcutter Store (Thursday 24/06/10)
Figure 3.5	Walk and Cycle Distances to Costcutter Store (Friday 25/06/10)
Figure 3.6	Walk and Cycle Distances to Costcutter Store (Saturday 26/06/10)
Figure 3.7	Walk and Cycle Distances to Costcutter Store (Sunday 27/06/10)
Figure 3.8	Walk and Cycle Distances to Costcutter Store (Monday 28/06/10)
Figure 3.9	Local Cycle Facilities
Figure 3.10	Public Transport Network
Figure 4.1	Observed Traffic, AM Peak
Figure 4.2	Observed Traffic, PM Peak
Figure 4.3	Year 2008 Accident Data
Figure 4.4	Year 2009 Accident Data
Figure 4.5	Year 2010 Accident Data
Figure 4.6	Year 2011 Accident Data
Figure 4.7	Year 2012 Accident Data
Figure 6.1	Cordon Entry Points
Figure 6.2	Development Generated Traffic Flows (294 Units), AM Peak
Figure 6.3	Development Generated Traffic Flows (294 Units), PM Peak
Figure 6.4	Year 2018 Baseline Flows, AM Peak
Figure 6.5	Year 2018 Baseline Flows, PM Peak
Figure 6.6	Year 2018 Baseline with Development Flows (294 Units), AM Peak
Figure 6.7	Year 2018 Baseline with Development Flows (294 Units), PM Peak
Figure 6.8	A3(M) Year 2012 Traffic Flows, AM Peak
Figure 6.9	A3(M) Year 2012 Traffic Flows, PM Peak
Figure 6.10	A3(M) Year 2018 Traffic Flows, AM & PM Peak
Figure 6.11	A3(M) Junction 2, Year 2012 Merging Diagram, AM & PM Peak
Figure 6.12	A3(M) Junction 2, Year 2012 Diverging Diagram, AM & PM Peak
Figure 6.13	A3(M) Junction 2, Year 2018 Merging Diagram, AM & PM Peak
Figure 6.14	A3(M) Junction 2, Year 2018 Diverging Diagram, AM & PM Peak
Figure 6.15	A3(M) Junction 3, Year 2012 Merging Diagram, AM & PM Peak
Figure 6.16	A3(M) Junction 3, Year 2012 Diverging Diagram, AM & PM Peak
Figure 6.17	A3(M) Junction 3, Year 2018 Merging Diagram, AM & PM Peak
Figure 6.18	A3(M) Junction 3, Year 2018 Diverging Diagram, AM & PM Peak

Tables

Table 3.1: Suggested Acceptable Walking Distances.....	10
Table 3.2: Local Bus Services	14
Table 3.3: Woodcroft Primary and Pre-School Car Drop-offs	17
Table 4.1: Summary of Annual Accident Data	24
Table 5.1: Housing Schedule	29
Table 5.2: Havant Borough Council Cycle Parking Standards.....	30
Table 5.3: Havant Borough Council Car Parking Standards and Proposed Site Parking Provision.....	31
Table 6.1: TRICS Sites (Mixed Private Housing)	33
Table 6.2: Total Person Trip Rates and Site Generation	33
Table 6.3: Vehicle Trip Rates and Site Generation	34
Table 6.4: Agreed Traffic Generation (including 10% TP reduction).....	34
Table 6.5: Traffic Distribution Proportions	35
Table 6.6: Census Data (Including trips remaining within the Cowplain area).....	36
Table 6.7: Census Data (Excluding Local/Cowplain Trips)	36
Table 6.8: Traffic Distribution Comparison	37
Table 6.9: Traffic Assignment Routes	39
Table 6.10: NTM Converted Local Growth Rates (TEMPRO 62)	40
Table 6.11: Development Impact on Milton Road – Lovedean Lane Corridor, Year 2018	41
Table 6.12: Development Impact on London Road – Hambledon Road Corridor, Year 2018.....	42
Table 6.13: Lovedean Lane/Milton Road: Proposed Mini-Roundabout (2018 With Development)	43
Table 6.14: Milton Road/Eagle Avenue, PICADY Results (2018 With Development)	44
Table 6.15: Site Access Junction Operation, Year 2018 With Development	46
Table 6.16: Development Traffic Flows to A3(M) Junction 2 – 294 Units	47
Table 6.17: Existing A3(M) Junction 2 Traffic Flows and Merge / Diverge Lane Requirement – Year 2012	48
Table 6.18: A3(M) Junction 2 Traffic Flows and Merge / Diverge Lane Requirement – Year 2018	49
Table 6.19: Existing A3(M) Junction 3 Traffic Flows and Merge / Diverge Lane Requirement – Year 2012	49
Table 6.20: A3(M) Junction 3 Traffic Flows and Merge / Diverge Lane Requirement – Year 2018	50

Appendices

Appendix 1.1	Site Masterplan & Accommodation Schedule
Appendix 1.2	PBA Transport Assessment Scope & HCC / HA Response
Appendix 3.1	CSL School Parking Survey, Eagle Avenue
Appendix 4.1	Traffic Survey Results
Appendix 4.2	Year 2010 Junction Assessment Results
Appendix 4.3	Electronic Copy of Assessment Result Files
Appendix 4.4	Vehicle Collision Records
Appendix 6.1	TRICS Data
Appendix 6.2	Year 2018 Junction Assessment Results
Appendix 6.3	TRADS Data
Appendix 6.4	A3(M) Assessment

Drawings

21834/004/003	Milton Road / B2150 Roundabout Improvements
21834/004/005b	Eagle Avenue Site Access Roundabout
21834/004/SK001	Lovedean Lane / Milton Road Mini-Roundabout Junction
21834/004/007	Vehicle Tracks
21834/004/008	Visibility Splays

This page is intentionally blank

1 Introduction

1.1 Background

- 1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Grainger plc to prepare this Transport Assessment (TA) to support the planning application for a residential development at Woodcroft Farm, Havant, Hampshire.
- 1.1.2 The location of the site is illustrated on [Figure 1.1](#).
- 1.1.3 The development is located adjacent to the existing residential suburb of Wecock and Cowplain and is to the north of Waterlooville (2km) and Havant town centres (6km).

1.2 Proposed Development

- 1.2.1 The proposed development comprises of 293 dwellings plus the existing Farmhouse, and facilitates the relocation of the Woodcroft Primary School playing field. The proposed masterplan is contained within [Appendix 1.1](#).
- 1.2.2 There are 204 new private units and 89 new affordable units (30%) proposed, plus the retention of the existing Farmhouse. A full schedule of accommodation is attached within Appendix 1.1, with a summary provided below:
 - One Bedroom units – 6;
 - Two Bedroom units – 115 (59 affordable);
 - Three Bedroom – 132 (26 affordable); and
 - Four Bedroom – 40 (4 affordable).
- 1.2.3 The site is identified as a Strategic Site within Havant Borough Council's Adopted Core Strategy for the development of up to 340 homes.
- 1.2.4 As detailed within the Core Strategy, there is scope to extend development into adjacent land parcels, which are within the neighbouring authorities of Winchester City Council and East Hampshire District Council. This expansion could provide approximately 700 homes across the entire site area, although it is considered unlikely that this level of units will be achieved. It is confirmed within the HBC Core Strategy, that the development of these adjacent sites would need to be promoted and allocated within the individual authorities' Local Development Frameworks.

1.3 Consultation with Hampshire County Council & Highways Agency

- 1.3.1 A Scoping Report setting out the proposed content and methodology for the TA was submitted to Hampshire County Council (HCC) and the Highways Agency (HA) for agreement on 30th August 2011.
- 1.3.2 In addition to this, PBA also met with the Highways Agency and their consultants at their offices on the 19th May 2011 to discuss the proposal.
- 1.3.3 Both HCC and the HA have responded to the Scoping Report and a copy of this correspondence, along with the scoping report, is attached within [Appendix 1.2](#).

2 Policy Review

2.1 Introduction

- 2.1.1 This section provides a review of national and local policy and how this relates to the development proposal for Woodcroft Farm.

2.2 National Planning Policy Framework

- 2.2.1 The Government published the National Planning Policy Framework (NPPF) in March 2012. This forms a key part of their reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.
- 2.2.2 With regards to achieving sustainable development, paragraph 7 of the NPPF sets out the requisites for sustainable development, stating: "There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:
- *An economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;*
 - *A social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and*
 - *An environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy."*
- 2.2.3 The NPPF provides further guidance on how sustainable development should be achieved, with paragraph 9 stating "Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life, including (but not limited to):
- *Making it easier for jobs to be created in cities, towns and villages;*
 - *Moving from a net loss of bio-diversity to achieving net gains for nature;*
 - *Replacing poor design with better design;*
 - *Improving the conditions in which people live, work, travel and take leisure; and*
 - *Widening the choice of high quality homes."*
- 2.2.4 Paragraph 14 states "At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.

2.2.5 For plan-making this means that:

- Local planning authorities should positively seek opportunities to meet the development needs of their area;
- Local Plans should meet objectively assessed needs, with sufficient flexibility to adapt to rapid change, unless:
 - Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
 - Specific policies in this Framework indicate development should be restricted.

2.2.6 For decision-taking this means:

- Approving development proposals that accord with the development plan without delay; and
- Where the development plan is absent, silent or relevant policies are out-of-date, granting permission unless:
 - Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
 - Specific policies in this Framework indicate development should be restricted."

2.2.7 With regards to promoting Sustainable Transport, paragraphs 29 to 32 of the NPPF states:

"Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas.

Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.

Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development, including large scale facilities such as rail freight interchanges, roadside facilities for motorists or transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas. The primary function of roadside facilities for motorists should be to support the safety and welfare of the road user.

All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.”

- 2.2.8 Still concentrating on sustainable transport, and specifically on how to minimise journey lengths and promote smarter travel choices, paragraphs 34 to 37 of the NPPF state:

“Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised. However this needs to take account of policies set out elsewhere in this Framework, particularly in rural areas.

Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to:

- *Accommodate the efficient delivery of goods and supplies;*
- *Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;*
- *Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and*
- *Consider the needs of people with disabilities by all modes of transport.”*

2.3 Local Policy: Hampshire Local Transport Plan 2011 - 2031

- 2.3.1 The Hampshire Local Transport Plan 2011-2031 (LTP) sets out the County Council's transport strategy. It explains how the wider policy objectives will be achieved and how it will help the County Council to make progress on its corporate priorities of ‘*developing and supporting stronger safer communities, maximising wellbeing and enhancing quality of place, and on its Sustainable Community Strategy. It will also help realise our vision of “safe, efficient and reliable ways to get around a prospering and sustainable Hampshire”*’.
- 2.3.2 The LTP has been written to meet the requirements in the Government's guidance on LTP's and to produce a strategy document that serves the needs of Hampshire's residents, businesses and visitors.

- 2.3.3 The LTP also states that: 'It is the Council's role to organise its own resources, make the best use of its powers, and work with a wide range of partner organisations, so that whatever happens in their lives people can:

- *Reliably get to the places they need to go;*
- *Choose how, when (and whether) to travel;*
- *Travel safely, for themselves and others;*
- *If possible, enjoy their journey.*

The Council also works with others where it can to contribute towards the health and prosperity of the places where people live and work, so that transport:

- *Respects and protects the physical quality of places;*
- *Serves places' economic needs;*
- *Minimises carbon emissions and the impact of climate change;*
- *Is fully integrated with other areas of policy affecting places (for example, economic development, energy and land-use planning);*
- *Helps places be sustainable and socially connected.'*

- 2.3.4 The core of the strategy is to produce a balanced transport strategy, with the aim to reduce the number of journeys made, and the average length of journeys. This can be achieved through creating more sustainable communities where employment and other services are closer to where people live as well as Travel Planning and other initiatives to reduce unnecessary journeys, particularly car journeys to work and school.

2.4 Local Policy: Havant Borough Core Strategy: Local Development Framework (Adopted March 2011)

- 2.4.1 The Core Strategy describes the council's long term vision and objectives for what the borough will be like as a place in 2026.
- 2.4.2 The Introduction and Vision section of the Strategy states that "The borough has excellent communications for a rapidly modernising local economy at the hub of road, rail and sea transport networks. The M27/A27 coastal trunk route and the A3(M) London route meet in Havant and link the south coast towns and their expanding ports with London and the rest of the south east" [Para 1.20].
- 2.4.3 The section also states that "Havant Borough Council has taken a leading role in the sub-regional partnership, Partnership for Urban South Hampshire (PUSH). PUSH is a voluntary partnership of eleven local authorities in South Hampshire: Eastleigh, Fareham, Gosport, Havant, Portsmouth, Southampton and parts of East Hampshire, New Forest, Test Valley and Winchester Districts and Hampshire County Council." [para 1.31]
- 2.4.4 With regards to Waterlooville (west of A3(M)), the Core Strategy states that "Good public transport links to Portsmouth exist via the A3 ZIP Bus Priority Corridor".
- 2.4.5 However, with respect to "Challenges and Opportunities" it does state that 'The A3(M) provides a physical separation between the Waterlooville area and the rest of the borough. Improved public transport from east to west is an important aspiration for the future of this area. The integration of the Major Development Area with Waterlooville is an important challenge for the future. The Major Development Area provides opportunities for a host of community benefits including additional employment and recreation space. Most importantly it will effectively create a new community which must be sustainable and integrated with the existing community.'

2.4.6 In respect to how these Challenges and Constraints are to be addressed, it is stated that 'A further strategic site for housing is identified at Woodcroft Farm, near Wecock Farm. The strategic site will complement the identification of Wecock Farm area as a priority area for regeneration.' It continues 'The potential to improve accessibility, by non-car means, from the west to the east sides of the borough is currently being investigated. Key to this will be utilising development potential at Dunsbury Hill Farm and other development allocations in order to assist the delivery of improved west to east accessibility'.

2.4.7 Amongst other things, **Policy CS1 Health and Wellbeing** states that "Planning permission will be granted for development which:

- *Support the leisure centres at Havant and Waterlooville as the main provision supplemented by more local provision of indoor sports facilities, including Building Schools for the Future.*
- *Contributes effectively to the opportunities for increasing cycling for all types of trips, creating and improving linkages within the borough, particularly along the stream corridors and along the coast between Emsworth, Havant and the borough boundary near Broadmarsh in accordance with the council's Walking and Cycling Strategy.*
- *Supports the increased footpath and cycle use through the design of development, linkage and signage."*

2.4.8 Policy **CS6 Regeneration of the Borough**, states that "Planning permission will be granted for development which positively contributes by type of use and design and by its comprehensive approach to the social, economic and/or physical regeneration of the whole borough; particularly when it is focused in the following places as shown on the Proposals Map:

5. Wecock Farm with particular focus on:

- a. Community support – Community Centre.*
- b. Transport connectivity.*
- c. Green Infrastructure.*
- d. Community safety.*
- e. Training and employment opportunities.*

All development proposals made under this policy must ensure that they benefit the borough socially, environmentally and economically."

2.4.9 With regards to Delivery Strategy, it is stated that "The other area of the borough in the lower 20% of the IMD [Indices of Multiple Deprivation] is Wecock Farm which is a large housing estate in the north west of the borough. Its location gives it access to Waterlooville and Portsmouth; however, it is not well linked with the rest of the borough. Recent housing redevelopment has delivered some community benefit, including playspace and a community centre. Portsmouth City Council is a major landlord and landowner in the area and the council will work positively with the city council to develop and support community cohesion. A strategic housing site is allocated nearby at Woodcroft Farm that will create an opportunity to deliver some of the small scale regeneration projects in conjunction with the strategic site." [para 4.13].

2.4.10 Within Section 7, "Caring for our Borough", Policy **CS16 High Quality Design** states that 'Planning permission will be granted for development that is designed to a high standard, which helps to create places where people want to live, work and relax. All development should demonstrate that its design:

- 1. Responds to, draws inspiration from and respects local context and:*
- d) Is well connected to and integrates with the immediate local area and the*

wider area by linking to existing pedestrian and cycle routes and encouraging people to use public transport where possible;

2. Produces a positive relationship between buildings, street and spaces both existing and proposed, where:

b) New streets are not dominated by vehicular traffic;

4. Is inclusive by considering the needs of those with disabilities, ensuring safe and convenient access for all; and integrating affordable and supported housing with market housing through tenure blind design to minimise social exclusion and promote social integration."

2.4.11 Within Section 7, it is also stated that 'When streets and spaces are well overlooked, well used, well managed and they are not dominated by vehicular traffic they are perceived as safe, secure and attractive places. This can be achieved by ensuring buildings, streets and spaces relate well to one another; spaces are well located and have a definite role and purpose; streets and spaces are well overlooked by buildings and passing vehicular and pedestrian traffic; and the amount of dead frontage, such as blank gable walls or high rear boundary walls, is kept to a minimum.' [para 7.43].

2.4.12 Policy **CS18 Strategic Site Delivery**, contained within Section 8 'Spatial Distribution and Strategic Sites', states that "The strategic sites are critical to achieving the Core Strategy vision. The council will permit development at the following strategic sites in accordance with the Development Requirements set out in the strategic site profiles:

- 1. Havant Public Service Village*
- 2. Havant Thicket Reservoir*
- 3. Dunsbury Hill Farm*
- 4. Major Development Area and Waterlooville Town Centre Integration*
- 5. Woodcroft Farm".*

2.4.13 Within Section 9 'Infrastructure, Implementation and Monitoring' **Policy CS20 Transport and Access Strategy** states that 'Development will be permitted that:

- 1. Is consistent with and contributes to the implementation of the 'Reduce, Manage and Invest' strategy.*
- 2. Does not increase congestion and promotes better use of existing transport networks.*
- 3. Improves accessibility to goods, services and employment and promotes equality in the transport system.*
- 4. Provides transport management measures to ensure the safe and efficient operation of the strategic and local road network.*
- 5. Ensures that highway design responds positively to the characteristics of the area and delivers a high quality public realm for all users.*
- 6. Maintains or improves the range of transport modes accessible to the users of the development site with specific emphasis on public transport, especially high quality/frequency buses and includes walking and cycling where appropriate.*
- 7. Improves highway, cycling and pedestrian links between the western built up area of the borough (Waterlooville) and the eastern area of the borough (centred on Havant) to create a strong east/west communication axis that passes through Dunsbury Hill Farm/Leigh Park'.*

2.4.14 Within Section 10 'Development Management Policies', Infrastructure – Transport, **Policy DM11 Planning for More Sustainable Travel** states that "The council will seek to ensure that

every opportunity is taken to increase integration of sustainable travel modes and availability of non-motorised modes by appropriate measures including:

- 1. Securing on-site and/or off-site interventions that promote integrated travel and access by non-motorised modes.*
- 2. Requiring safe and secure vehicular and cycle parking and turning facilities to adopted standards.*
- 3. Securing appropriate improvements to public and community transport (including infrastructure requirements) in accordance with the Hampshire Local Transport Plan and (where applicable) the relevant sub-regional transport strategy.*
- 4. Proposals for reducing opportunities for informal parking in the area surrounding the development where this would impact on the capacity, operation and safety of the local highway network and/or the amenity of the locality.*
- 5. Ensuring that new developments are located and designed at the outset to encourage lower vehicle speeds and safe, permeable, inclusive layouts that integrate with existing pedestrian, cycle and public transport routes. This will facilitate and encourage short distance trips by cycle and walking, including to public transport interchanges."*

2.4.15 Policy **DM12 Mitigating the Impacts of Travel** states that "New developments will be required to mitigate their travel impact, including the environmental impacts of travel (such as noise, air and visual pollution) and impacts on amenity, health and climate change by ensuring that, where relevant, the following criteria are met:

- 1. Adequate provision is made for integrated and improved transport infrastructure or appropriate mitigation measures, through direct improvements and S106 contributions in accordance with the Hampshire County Council Transport Contributions Policy.*
- 2. The submission of a transport assessment and travel plan alongside any planning application on proposals for major development or where a proposal is likely to have significant transport implications."*

2.4.16 Policy **DM13 Car and Cycle Parking on Residential Development** states that "Residential development will only be permitted where it provides car parking and cycle storage in accordance with the standards set out in the Residential Car Parking and Cycle Provision Supplementary Planning Document".

2.4.17 Policy **DM14 Car and Cycle Parking on Development (excluding residential)** states that 'Residential development will only be permitted where it provides parking for cars, motor cycles and cycles in accordance with the relevant standards. Such parking provision must be appropriately located in relation to the development and be practical for its intended use'.

2.4.18 Policy **DM15 Safeguarding Transport Infrastructure** states that "Development will not be permitted where it is prejudicial to the future provision of strategic transport infrastructure. Land to be safeguarded will be identified in the Development Delivery (Allocations) Plan or other local development document as appropriate and agreed with the appropriate delivery body".

2.5 Summary

2.5.1 This report will demonstrate how the Woodcroft Farm site is very well placed to meet the objectives of national and local planning policy, for example:

- Good pedestrian and cycle connection throughout the site, connecting into neighbouring networks;
- Provides resident and visitor cycle parking in accordance with HCC standards;
- Is located within walking distance of high frequency bus services;

- Is within walking and cycling distance of numerous education, retail, leisure and employment facilities;
- Good design practice adopted;
- Internal access arrangement designed to reduce vehicle speeds at or below target speed of 20mph;
- Car Parking to be provided in accordance with HCC standards, with the level of parking that is to be provided reducing the potential for off-site parking;
- S106 contributions to be provided in accordance with HCC Contribution Policy.

3 Baseline Conditions: Access and Movement

3.1 Introduction

- 3.1.1 This section provides general detail on the existing transport infrastructure and services provided within the local and wider area, along with details on key destinations for new residents such as: health, employment, retail and educational facilities, and how these can be accessed from the site.

3.2 Site Location

- 3.2.1 At a regional level, the site is well placed to access the town centres of Waterlooville and Havant which are located approximately 2km and 6km to the south of the site respectively. Both of these town centres offer a wide selection of services and facilities.
- 3.2.2 At a local level, and as illustrated on **Figure 3.1**, the site is located to the north-west of the Wecock residential suburb. The site is bordered by open fields to the north, to the south and west by an existing public bridleway and to the east by the existing residential development at James Copse Road. Directly to the south of the bridleway that borders the site is Woodcroft Primary School and a recreation ground.
- 3.2.3 The site is accessed from the east via Woodcroft Lane, which connects to Lovedean Lane and, in turn, provides access to the A3 London Road, which is located approximately 1.0km to the east.

3.3 Acceptable Walking & Cycling Distances

- 3.3.1 The Chartered Institute of Highways and Transportation published guidance on the suggested acceptable walking distances for pedestrians without mobility impairment and this is reproduced in **Table 3.1**.

Table 3.1: Suggested Acceptable Walking Distances

Definition	Trip Purpose		
	Town Centres (metres (minutes))	Commuting/School (metres (minutes))	Elsewhere (metres (minutes))
Desirable	200 (2.5)	500 (6.25)	400 (5)
Acceptable	400 (5)	1000 (12.5)	800 (10)
Preferred Maximum	800 (10)	2000 (25)	1200 (15)

Source: Providing for Journeys on Foot, Institute of Highways and Transport (IHT 2000)

- 3.3.2 The distances presented in Table 3.1 show that the desirable walking distance is generally 400 metres, with the acceptable walking distance being 800 metres. This also shows that people are willing to walk further to work or school.

3.4 Local and Strategic Access and Movement – Access to Amenities

- 3.4.1 Local and national policies place significant emphasis on the need to integrate land use, transport and planning decisions.
- 3.4.2 Analysis had been undertaken to understand the development sites proximity and accessibility to education, health, employment, retail, leisure and community facilities.

- 3.4.3 The local services and amenities have been identified from on-site observations and discussed within in this chapter. The locations of these local services and amenities are illustrated on **Figure 3.2**.

Accessibility to Education

- 3.4.4 The site is located adjacent to Woodcroft Primary School and Pre-School. The residents will therefore be within easy reach of this school and therefore well within the desirable walking distance of 500 metres (as set out in Table 3.1). There are a further two primary schools (Hart Plain and Padwell) within a 1.6km walking distance of the site.
- 3.4.5 The nearest secondary school to the site is Cowplain Community School, located to the south of the site and within a 2.0km walking distance, therefore within the preferred maximum walking distance of 2.0km (25 minutes).
- 3.4.6 Bus Service 39, which operates along Eagle Avenue, provides access to South Downs College, a twenty minute journey from the site.
- 3.4.7 Furthermore, Bus Services 7 and X40, also operate along Eagle Avenue, providing access to Oaklands Secondary School and Sixth Form College, a fifteen minute journey from the site.
- 3.4.8 There is a Special Education Needs School (Rachel Madocks) in close proximity to the site. The school is located close to Eagle Avenue, within 500 metres of the site.
- 3.4.9 There is also a childcare / nursery facility provided within 400 metres of site at Kite Close and a pre-school within the Woodcroft Primary School site.

Accessibility to Health Facilities

- 3.4.10 Waterloo Doctor Surgery is located to the south of the site on Dryden Close, accessed via Milton Road. There is also the Queenswood Surgery on London Road. The site is within a 1.6km walking distance of both health facilities. Bus Service 7 also provides access to Cosham Health Centre, a twenty minute journey from the site.
- 3.4.11 The nearest hospital to the site is Queen Alexandra Hospital in Cosham, with the private Spire Portsmouth Hospital located in Havant. Both of these hospitals are accessible via the local bus services.

Accessibility to Employment

- 3.4.12 There is a range of employment opportunities provided within Waterloo town Centre, 2.0km to the south of the site. Furthermore, there are two significant business / industrial estate areas to the south of the site and also within a 2.0km distance of the site. Both employment areas are located on the northern edge of Waterloo town centre in the vicinity of the Hambledon Road / Milton Road junction. These areas include:
- Alton Road Industrial Estate;
 - Churchill Yard;
 - Jubilee Business Centre;
 - Parkwood Centre;
 - Hambledon Road Industrial Estate;
 - Brambles Business Park;

- Numerous Large Retail Units (Dreams Bed Store, Halfords, DFS, Matalan, Argos, Brantano, TK Maxx, Carpet Right, SCS).

3.4.13 Hazleton Interchange Business Park is also, located 2.5km to the northeast of the site. The park is accessed via Lakesmere Road, adjacent to the Morrisons Superstore / A3(M).

3.4.14 There are also other employment opportunities provided closer to the site at the local shopping precincts / centres (discussed below) and the shops / facilities provided within Cowplain Centre along the A3 London Road.

Accessibility to Retail / General Facilities

3.4.15 There are numerous retail facilities within easy reach of the site, accessible by foot, cycle or the local bus services.

3.4.16 There are two local shopping precincts within 800 metres of the site:

- Lovedean Lane / Eagle Avenue (500m); and
- Eagle Avenue / Chaplains Avenue.

3.4.17 These two precincts provide a range of shops and services, including newsagents/general stores, pharmacy, takeaways and hairdressers. A full list of the shops is provided on Figure 3.2.

3.4.18 There are two further local shopping precincts within 1.6km of the site: Milton Parade and Hambledon Parade.

3.4.19 Cowplain Centre is also located within 1.6km of the site and this village / district centre offers a comprehensive range of facilities including banks, restaurants, optician, butcher, dentist and fitness centre.

3.4.20 Slightly further away is Waterlooville Town Centre which provides an even more extensive range of employment opportunities and facilities, including supermarkets, clothes shops and general retail units.

3.4.21 An extensive range of retail facilities is therefore within acceptable walking and cycling distance of the site. The majority of these facilities are also accessible by the local high frequency bus services that operate along Eagle Avenue.

3.4.22 The proposed development would further enhance the viability and vitality of these shopping areas. In view of the close proximity of the site to existing facilities, it is anticipated that the proposed development could generate a high proportion of local journeys by walking and cycling and therefore the Woodcroft Farm site provides a good opportunity to deliver sustainable development.

3.4.23 At the exhibition event, some residents raised concern that residents may not be willing to walk to the local convenience stores (a similar number of residents stated the contrary).

3.4.24 In response to the initial concern, the current catchment for the local store has been reviewed.

3.4.25 The local Costcutter store undertook customer surveys between Wednesday 23rd and Monday 28th June 2010, which recorded where their customers had travelled from and their mode of travel to the store.

3.4.26 **Figures 3.3 to 3.8** summarise the walk and cycle trip locations for each of the survey days. It should be noted that the survey did not record the house numbers of the customers' address

and therefore the locations shown are not the exact location, with instead the closest distance to the store plotted on the figures.

- 3.4.27 The results, presented within these figures, show that a number of customers walk in excess of 1km to reach the store. Similar cycling distances are also recorded. These results therefore verify the IHT suggested walk distances presented within Table 3.1 and that people are willing to walk 1200m to a shop. The maximum walking distance recorded within the customer surveys being from Puffin Walk, a distanced of 1.3km, which is similar to the preferred maximum walking distance of 1.2km. The site is within walking and cycling distance of numerous facilities, including the local Milton Road shopping precinct that accommodates a number of shops, including the CostCutter store, 600 metres from the site.

Accessibility to Leisure and Community Facilities

- 3.4.28 There are a number of leisure and community facilities within 2km of the site, including

- Acorn Community Centre;
- Littleford Family Resource Centre;
- North West Children's Centre;
- Lovedean Village Hall;
- Cowplain Activity Centre;
- Waterloooville Golf Club;
- Waterloooville Leisure Centre (swimming pool and health/fitness centre);
- Recreation Grounds; and
- Public Houses.

Summary

- 3.4.29 It has been demonstrated that there is a wide range of educational, health, employment, retail, leisure and community facilities within a 2km walking and 5km cycling distance of the site.
- 3.4.30 Furthermore, frequent bus services provide access to Havant town centre / railway station and to other local attractions.
- 3.4.31 Therefore, the development site is well placed with regards to local facilities and offers the opportunity for many trips to be undertaken by means of travel other than the private car.

3.5 Footway and Cycleway Network

- 3.5.1 Walking is the most important means of travel at the local level and offers the greatest potential to replace short car trips, particularly those under two kilometres. Cycling also provides the opportunity to substitute for short car trips, less than 5km, for the majority of people and to also form part of a longer journey by public transport. This section demonstrate that the site is within an acceptable walk and cycle distance of a number of local facilities.
- 3.5.2 Existing local cycle facilities are illustrated on **Figure 3.9**, which shows that there is a short length of cycle lane to the south of Kite Close/Eagle Avenue, but there are no other cycle lanes in the immediate site area. The local roads are of residential nature, therefore relatively quiet and low speed, therefore on-road cycling conditions are good.
- 3.5.3 Within the wider area, there are cycle lanes along the length of the A3, providing access into Waterloooville town centre and onwards to the Purbrook and Widley settlements and beyond. Access to these routes are available via quiet routes along residential routes such as

Longwood Avenue and Durley Avenue. There is also a cycle lane provided to the south of Milton Road offering both westbound and southbound access, connecting the site to the Elettra Avenue industrial area and Waterlooville leisure centre to the west of Hambledon Road and to Waterlooville town centre to the south.

- 3.5.4 All the local roads have footways, which provide access across the Wecock and Cowplain residential areas and on to the A3 London Road and Waterlooville town centre.

3.6 Public Transport

Bus Service

- 3.6.1 A summary of the local bus routes that currently serve the local area is provided within **Table 3.2**. The routes and bus stop locations are illustrated on **Figure 3.10**.

Table 3.2: Local Bus Services

Route Number	Nearest Stop	Route Description	Service Frequency (mins)		
			Weekday Peak	Weekday Daytime	Weekend
39	Eagle Avenue	Wecock Farm – Waterlooville - Havant	10	10	10 (Sat) 60 (Sun)
7		Wecock Farm – Waterlooville – Hilsea - Southsea	10	10	10 (Sat) 20 (Sun)
X40		Wecock – Southsea	School Service – 2 morning services		-
300		Denmead – Emsworth – Chichester	2 buses per day		-
X9	Sunnymead Drive	Portsmouth – Cosham – Waterlooville - Hambledon	60	60	60 (Sat)
37	Cowplain Shops	Liss – Petersfield – Clanfield – Waterlooville - Havant	60	60	60 (Sat)
8		Portsmouth – Hilsea – Cosham – Waterlooville – Clanfield	15	15	15 (Sat)

- 3.6.2 The table above shows that there is a good level of bus services operating along Eagle Avenue, with route numbers 7 and 39 providing frequent services to Southsea and Havant respectively, with both services running through Waterlooville.
- 3.6.3 The distances presented in Table 3.1 show that the desirable walking distance for most trips is 400 metres, with the acceptable walking distance being 800 metres. The majority of dwellings within the proposed development will be within a 400 metre walking distance of the Eagle Avenue bus stops, with all being within an 800 metre walking distance.
- 3.6.4 There are additional bus services operating via Sunnymead Drive and Cowplain Shops/London Road, although the nearest stops for these services are further away, a walking distance of approximately 1.5 kilometres (15 minutes).

Rail Service

- 3.6.5 Havant Railway Station is located approximately 6km to the south-east of the site and can be reached by local bus service 39 that runs along Eagle Avenue, within a 40 minute journey time.
- 3.6.6 The station provides direct access to numerous key destinations, a summary of which is provided below along with the associated frequency and journey time:
- Chichester, 5 trains per hour, 15 minute journey time;
 - Portsmouth, 6 trains per hour, 16 minute journey time;
 - Worthing, 2 trains per hour, 40 minute journey time;
 - Southampton, 2 trains per hour, 40 minute journey time;
 - Horsham, 3 trains per hour, 50 minute journey time;
 - Brighton, 2 trains per hour, 1 hr journey time;
 - Gatwick Airport, 2 trains per hour, 1 hr 10 minute journey time;
 - London Waterloo, 3 trains per hour, 1 hr 19 minute journey time;
 - London Victoria, 5 trains per hour, 1 hr 45 minute journey time.
- 3.6.7 This shows there is a good level of services provided from Havant train station.
- 3.6.8 The site is also connected to Cosham Railway Station via bus services 41 and 45/45A within a 40 minute journey time. The station provides a good frequency of service to the following destinations:
- Portsmouth;
 - Southampton;
 - London Waterloo;
 - Basingstoke;
 - Reading;
 - Brighton;
 - Cardiff.
- 3.6.9 Rowlands Castle railway station is located 5km to the east of the site. However, this station is not connected to the site by local bus services. The station offers services between Portsmouth to London Waterloo (via Guildford and Woking), with a peak and off peak frequency of three and one train per hour respectively.

3.7 Local Highway Network

- 3.7.1 The site is well placed in relation to the local road network, with the A3 London Road / Portsmouth Road, located approximately 1km to the east, providing access to northbound and southbound destinations including Cosham / Widley / Purbrook and Petersfield respectively. The A3 also links to other key routes, including:
- The A3(M), which is to the east of the site and provides access to the regional centres of Havant and Portsmouth to the south and Guildford, via the A3, to the north. The A3 continues northwards past Guildford, connecting to the M25 and into central London. Access into London along this route has been improved through the completion of the Hindhead Tunnel, with this providing a continuous dual carriageway link between London and Portsmouth and removing a major source of congestion around the A3/A287;
 - The A27/M27 south coast route, located to the south of Horndean, is accessed directly from the A3(M). The A27/M27 provides connection to the regional centres of Fareham and Southampton to the west and Chichester and Brighton to the east;
 - The B2149/B2148 provides access to Rowlands Castle to the east and Hermitage, Westbourne and Southbourne to the south-east.

3.8 Woodcroft Primary School Trip Survey

- 3.8.1 During the Public Exhibition for the site, held at the Acorn Centre on Friday 7th and Saturday 8th October, Councillor Michael Cheshire raised concerns with regard to the level of parents that drive their children to school and the associated problems that this creates on Eagle Avenue.
- 3.8.2 Therefore, on Monday 17th October PBA completed a site visit to observe the access arrangement and level of car trips associated with the school. On the day of the survey it was clear and sunny but cold on arrival at the site at 8.00am, and as illustrated on the two photographs below, a total of 7 cars were parked on Eagle Avenue within the vicinity of the path that leads to the school gate. None of these cars were blocking access to the bus stop.



- 3.8.3 A summary of the total level of cars that were recorded dropping pupils off at the school and pre-school is presented in **Table 3.3**.

Table 3.3: Woodcroft Primary and Pre-School Car Drop-offs

Car Description	Arrival Time	Departure Time	Duration (mins)
1) Silver Astra	8.35	8.46	11
2) White Corsa	8.36	8.45	9
3) Blue Astra	8.41	8.56	15
4) Silver Astra	8.43	8.49	6
5) Silver Corsa	8.46	8.52	6

- 3.8.4 The summary above shows that there were 5 parents that drove to the school / pre-school.
- 3.8.5 In addition to this survey, PBA commissioned the independent survey company Community Systems Limited to complete a similar survey with video on Monday 21st November 2011 as the Monday was considered the worst day for school traffic/parking. The results of this survey are attached within [Appendix 3.1](#). The results were very similar to the PBA survey, recording five cars stopping to drop off pupils between the survey period of 7.30am to 9.30am. The cars parked at 08:31, 08:34, 08:41, 08:42 and 08:43.
- 3.8.6 It is believed that even on days when the weather is poor the level of vehicle trips would not be that much higher due to the close proximity of the school to the Wecock Estate. Parents/children would still not be able to avoid the rain by using the car due to the walking distance from the parking area to the school gate and into the school buildings.

4 Baseline Conditions: Road Network Characteristics

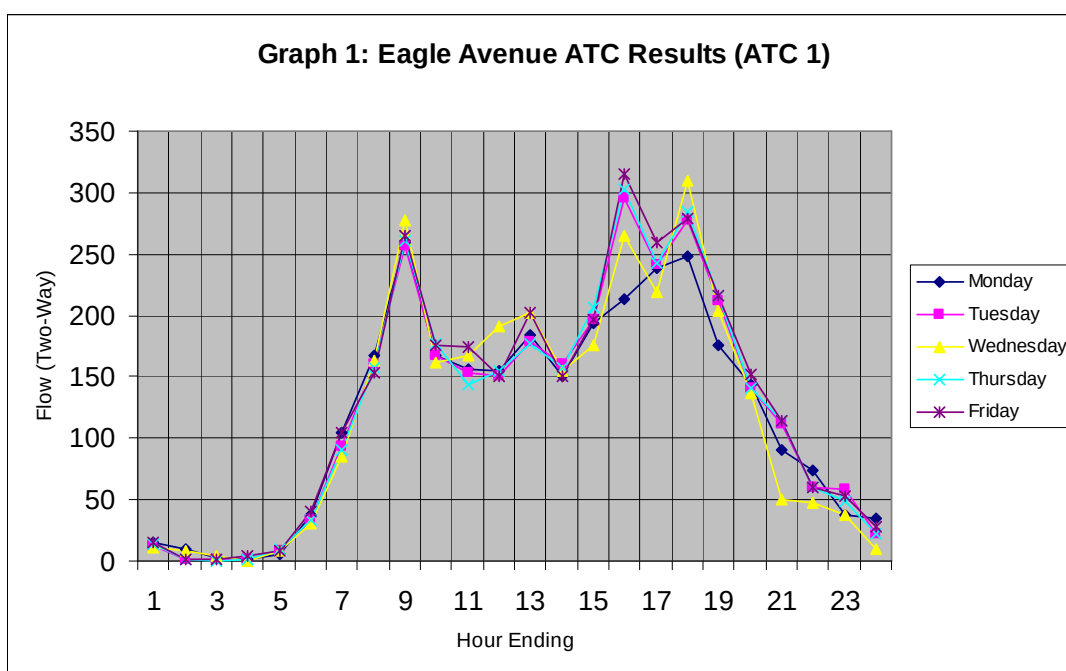
4.1 Introduction

- 4.1.1 This section details the existing level of traffic flow, operation of junctions and road safety record within the study area.

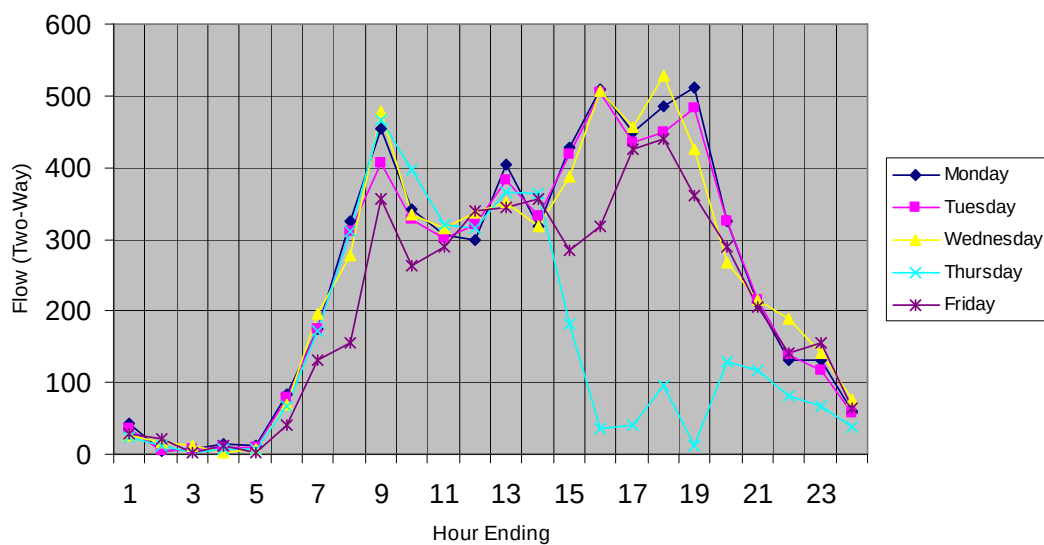
4.2 Baseline Traffic Flows

Observed Traffic Flows

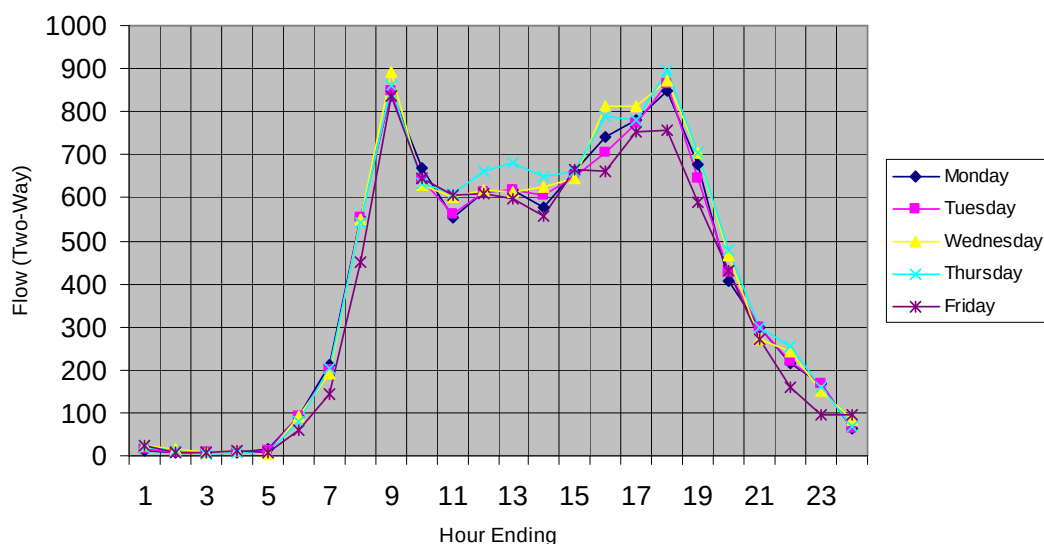
- 4.2.1 A number of manual classified traffic count (MCC) surveys were undertaken at junctions within the study area on Tuesday 23rd February 2010 between 7.30 - 9.30am and 4.30 - 6.30pm by the independent survey company Community Systems Limited. Weeklong automatic traffic counts (ATC) were also undertaken along Eagle Avenue, Hart Plain Avenue, Milton Avenue (x2) and Longwood Avenue. The results of these traffic surveys are attached within **Appendix 4.1**. Queue length surveys were also completed at each of the junctions and these have been used to validate the assessment models.
- 4.2.2 In order to understand if Tuesday 23rd February was a typical day, the individual weekday daily flow profiles for each of the ATC sites are illustrated on **Graphs 1 to 5**.



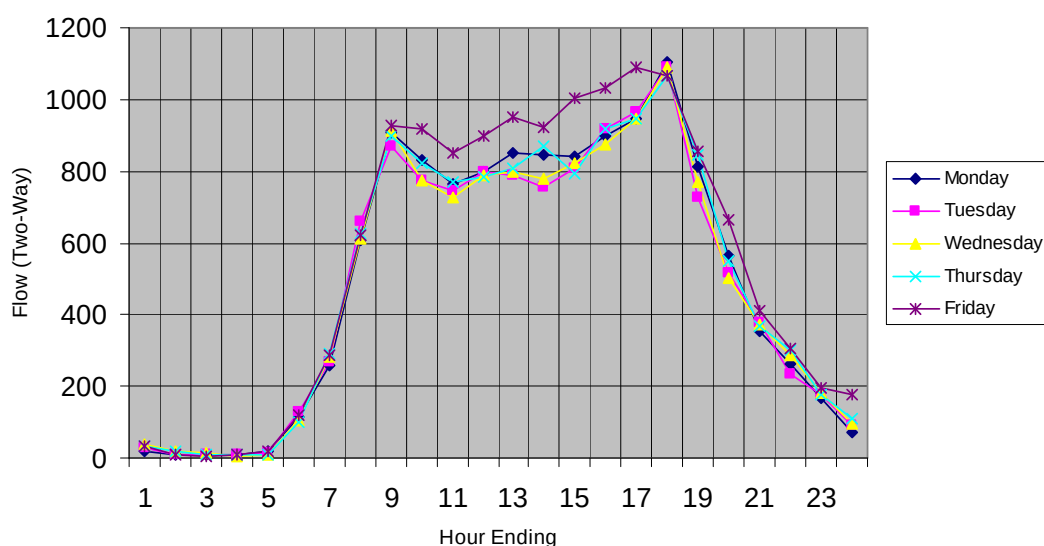
Graph 2: Hart Plain Avenue ATC Results (ATC 2)



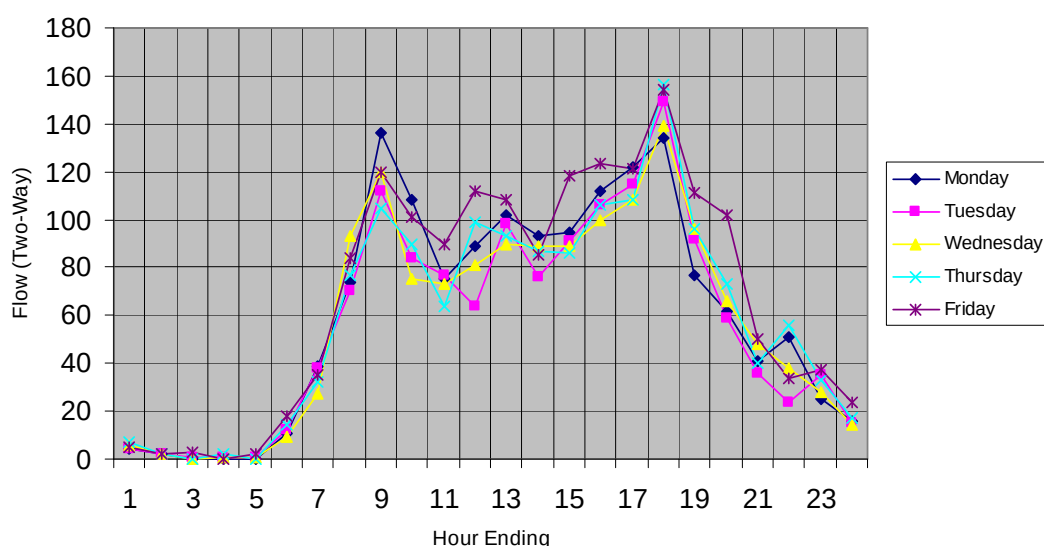
Graph 3: Milton Road (N) ATC Results (ATC 3)



Graph 4: Milton Road (S) ATC Results (ATC 4)

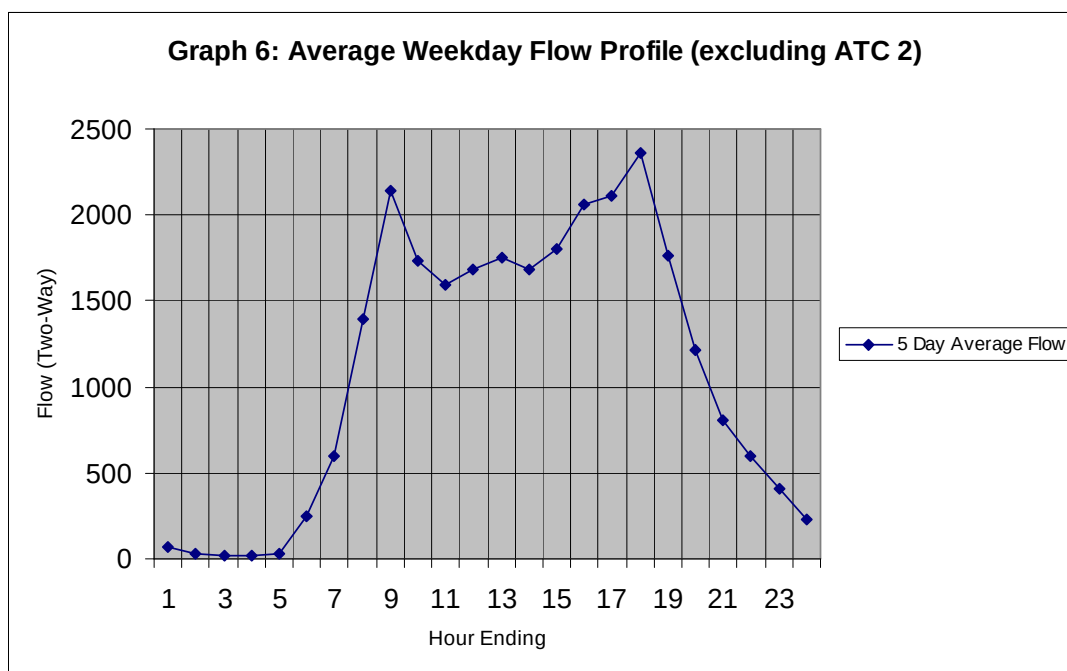


Graph 5: Longwood Avenue ATC Results (ATC 5)



4.2.3 Graphs 1 to 5 show that Tuesday 23rd was a typical day and the results of the MCC surveys are therefore suitable for use within the assessment work without any adjustment.

- 4.2.4 Analysis of the MCC survey results has identified that the AM and PM peak periods are 0800-0900 and 1645-1745 respectively. The results of the weeklong average daily flow profiles from the ATC surveys (excluding site 2 because of a problem with data collection on Thursday and Friday), as summarised on **Graph 6** below, confirms that the identified peak periods are correct.



- 4.2.5 The recorded traffic flows for the AM and PM peak periods are illustrated on **Figures 4.1** and **4.2** respectively.

4.3 Junction Assessment Results (Observed Traffic Flows)

- 4.3.1 The junctions within the study area have been tested using the traffic flows observed during the February 2010 surveys. The associated queue surveys have been used to validate the junction models to ensure that the observed operation is replicated.

- 4.3.2 The junctions have been assessed using the following junction modelling software programs:

- PICADY (Priority controlled junctions);
- ARCADY (Roundabout junctions); and
- LINSIG (Signalised junctions)

- 4.3.3 The peak hour flows have been tested assuming a flat arrival profile, which best reflects the observed performance of the junctions (in terms of spare capacity and queuing) and also the reality of peak spreading for future scenario testing. This methodology also matches the LINSIG flows profiles.

- 4.3.4 The results of the completed year 2010 baseline assessments are summarised in tables attached within **Appendix 4.2**.

- 4.3.5 Electronic copies of all of the assessment files are contained within **Appendix 4.3** (CD).

- 4.3.6 It should be noted that The Ratio of Flow to Capacity (RFC) value output in ARCADY and PICADY provides an indication on the operation of a junction, with a value of 1.00 indicating that the junction is operating at it's theoretical operating capacity and values exceeding 1.00 show the junction to be operating above capacity (excess levels of delay and queuing). For consistent junction performance an RFC value of 0.85 or below is desirable. Junctions with RFC's above this level may be operate erratically, with queues and delays varying daily and during the peak periods.
- 4.3.7 The LINSIG software gives a similar output to ARCADY and PICADY, which is Degree of Saturation (DoS). A DoS of 100% shows that the junction is operating at it's theoretical operating capacity and 85% is a desirable maximum.
- 4.3.8 A summary of the results of the junction assessments is provided below:
- 4.3.9 Lovedean Lane/Woodbury Grove: The results of the assessments completed for this priority controlled junction demonstrate that there is a significant level of spare capacity, representative of the cul-de-sac nature of the junction.
- 4.3.10 Lovedean Lane/Frogmore Lane: Maximum RFC values of 0.47 and 0.39 are shown for the AM and PM peak periods respectively.
- 4.3.11 Lovedean Lane/Woodcroft Lane: The results show a significant level of spare capacity.
- 4.3.12 Lovedean Lane/Milton Road: The results of the AM and PM peak period assessments show maximum RFC values of 0.83 and 0.86 respectively. These maximum RFC values are on the minor arm (Milton Road) of this priority controlled junction and shows that the junction is currently approaching it's theoretical operating capacity with the observed level of traffic flow.
- 4.3.13 Milton Road/Eagle Avenue: This mini-roundabout junction is operating within its theoretical operating capacity during both the AM and PM peak periods, with RFC values of 0.75 and 0.71 respectively.
- 4.3.14 Milton Road/Durley Avenue: This priority controlled junction operates well within it's theoretical operating capacity with maximum AM and PM peak RFC values of 0.17 and 0.25 respectively.
- 4.3.15 Milton Road/Hart Plain Avenue: This junction operates with maximum AM and PM peak period RFC values of 0.54 and 0.41 respectively, both being on the Hart Plain Avenue (W) arm, with the RFC values on the remaining arms all being below 0.12.
- 4.3.16 Milton Road/Pyrford Close: The junction is operating well below its theoretical operating capacity, with a maximum RFC value of 0.30.
- 4.3.17 Milton Road/Hart Plain Avenue (E): This junction operates with a maximum RFC value of 0.62 during the AM peak period, with a queue of 2 vehicles on the Hart Plan Avenue approach, and a maximum RFC of 0.22 during the PM peak.
- 4.3.18 Milton Road/Sunnymead Drive: The junction operates with similar levels of RFC during both the AM and PM peak periods, with maximum RFC values of 0.40 and 0.41 respectively.
- 4.3.19 A3 London Road/Dell Piece Way Junction: The results of the AM peak period show the junction operating with a maximum degree of saturation (DoS) of 87% and this is representative of the observed operation of the junction. This junction provides access to the A3(M) and is also one of the main access routes into Cowplain/Waterlooville. Site observations show that although there are queues on all approaches to the junction, during the majority of the junction cycles all queued vehicles are able to travel through the junction, without having to wait for the subsequent green signal. Therefore, although the junction is

heavily trafficked, it still operates reasonably well and also provides the benefit of having dedicated pedestrian crossing facilities across the junction.

- 4.3.20 During the PM peak period, the junction is forecast to operate with a maximum DoS of 72%.
- 4.3.21 A3 London Road/Lovedean Lane: This priority controlled staggered junction is forecast to operate with maximum RFC values of 0.59 and 0.65 during the AM and PM peak periods respectively.
- 4.3.22 A3 London Road/Longwood Avenue: This junction operates well during both the AM and PM peak periods, with maximum RFC values of 0.38 and 0.21 respectively.
- 4.3.23 A3 London Road/Durley Avenue Junction: This junction is forecast to operate within capacity during both the AM and PM peak periods, with maximum DoS of 63% and 76% respectively.
- 4.3.24 A3 London /Silvester Road: This junction operates well in both peak periods with a maximum RFC value of 0.46 forecast.
- 4.3.25 A3 London Road/Hart Plain Avenue (E): During the AM peak, this junction operates with an RFC value of 0.68 on the Hart Plain Avenue (E) approach with low queues (2 vehicles). During the PM peak, the junction operates with a maximum RFC value of 0.43.
- 4.3.26 A3 London Road/B2150 Hulbert Road Roundabout: This junction operates with maximum RFC values of 0.68 and 0.72 during the AM and PM peak periods respectively. There are minimal levels of queuing.
- 4.3.27 A3 Maurepas Way/Hambledon Road Roundabout: This junction operates well within its theoretical operating capacity, with maximum RFC values 0.62 and 0.52 during the AM and PM peak periods respectively.
- 4.3.28 Hambledon Road/Milton Road Roundabout: The roundabout is forecast to be approaching its theoretical operating capacity during the AM peak period, with an RFC value of 0.80 on the Milton Road arm. During the PM peak period, the junction operation is improved, with a maximum RFC value of 0.58 predicted.
- 4.3.29 Hambledon Road/Sunnymead Drive: This priority controlled junction is forecast to be approaching its theoretical operating capacity during the AM peak period, with an RFC value of 0.89 on the minor arm, Sunnymead Drive. During the PM, period the junction operation is greatly improved, as there is less traffic exiting from Sunnymead Drive, with a maximum RFC value of 0.52 forecast.

4.4 Vehicle Collision Records

- 4.4.1 PBA has obtained and reviewed the accident records for all of the roads within the study area for the five year period between 1st January 2008 and 31st December 2012, a copy of which is attached within **Appendix 4.4**. This information was obtained from Hampshire Police, who record all accidents that are reported and involve injury. The accidents are classed into three categories: slight, serious and fatal, a definition of which is provided below:
- **Slight Injury**: Injuries of a minor nature, such as sprains, bruises, or cuts not judged to be severe, or slight shock requiring only roadside attention (medical treatment is not a prerequisite for an injury to be defined as slight);
 - **Serious Injury**: Injuries for which a person is detained in hospital, as an in-patient, or any of the following injuries, whether or not a person is detained in hospital; fractures, concussion, internal injuries, severe cuts and lacerations, severe general shock

requiring medical treatment and injuries which result in death 30 days after the accident. The serious category, therefore, covers a very broad range of injuries; and

- **Fatal Injury:** Injuries which cause death either immediately or any time up to 30 days after the accident.

4.4.2 The accident records have been analysed and a summary of the accident locations, severity of injury, vehicles involved and road surface conditions are illustrated on **Figures 4.3 to 4.7** for the years 2008 to 2012 respectively. A summary of the annual accident data within the study area is provided within **Table 4.1**, with a more comprehensive description of the accidents contained within summary tables attached within Appendix 4.4.

Table 4.1: Summary of Annual Accident Data

		Year				
		2008	2009	2010	2011	2012
Total Accidents	Slight	28	28	29	31	29
	Serious	8	3	10	10	9
	Fatal	0	0	0	0	0
	Total	36	31	39	41	38
Accidents Involving Cyclists	Slight	6	3	3	5	3
	Serious	0	0	1	2	0
	Fatal	0	0	0	0	0
	Total	6	3	4	7	3
Accidents Involving Pedestrians	Slight	2	2	3	4	1
	Serious	0	1	4	2	4
	Fatal	0	0	0	0	0
	Total	2	3	7	6	5

2008 Summary

4.4.3 A total of 36 accidents were recorded in 2008, resulting in 28 slight injuries, eight serious injuries and no fatalities. The results showed that no accidents were a result of poor highway design / road conditions. The majority of accidents were caused by either poor driving or observation.

4.4.4 A summary of the accidents involving pedestrians is provided below:

- Ref. No. 10, Slight: pedestrian waiting by side of his car was struck by wing mirror of passing vehicle;
- Ref. No. 11, Slight: 12 year old pedestrian stepped into path of oncoming vehicle.

4.4.5 A summary of the accidents involving cyclists is provided below:

- Ref. No. 7, Slight: Driver failed to look properly and drove into rear of 13 year old cyclist;
- Ref. No. 19, Slight: bus overtook and clipped 12 year old cyclist;
- Ref. No. 21, Slight: Car entered London Road from private driveway into path of cyclist travelling on cycle lane;
- Ref. No. 23, Slight: Cyclist knocked over by a car that cut in front of them;
- Ref. No. 28, Slight: Car entered from minor road into path of oncoming cyclist;
- Ref. No. 36, Slight: Cyclist knocked over by car on entering main road from minor road by car turning in opposite direction.

2009 Summary

4.4.6 A total of 31 accidents were recorded in 2009, resulting in 28 slight injuries, three serious injuries and no fatalities. The results showed that no accidents were a result of poor highway design / road conditions. The majority of accidents were caused by either poor driving or observation. Two of the accidents can be discounted as the drivers were impaired by alcohol (both serious accidents), two occurred through roadworks/temporary traffic lights, one involved a police car on an emergency call and one was caused by black ice.

4.4.7 A summary of the accidents involving pedestrians is provided below:

- Ref. No. 17, Slight: 12 year old pedestrian ran into path of oncoming vehicle;
- Ref. No. 20, Serious: 4 year old pedestrian ran into path of oncoming vehicle;
- Ref. No. 21, Slight: Pedestrian struck crossing road at temporary traffic lights. The normal crossing point was out of use.

4.4.8 A summary of the accidents involving cyclists is provided below:

- Ref. No. 6, Slight: Car cut a corner, mounting pavement and striking cyclist;
- Ref. No. 8, Slight: Cyclist failed to look when crossing road;
- Ref. No. 24, Slight: Cyclist crossed road into path of oncoming vehicle.

2010 Summary

4.4.9 A total of 39 accidents were recorded in 2010, resulting in 29 slight injuries, 10 serious injuries and no fatalities. The results showed that no accidents were a result of poor highway design / road conditions. The majority of accidents were caused by either poor driving or observation. The following four accidents, two of which resulted in serious injury, can be discounted: Ref. No. 3 involved a driver passing out; Ref. No. 8 involved a bus driving off before a passenger had alighted; Ref. No. 36 involved a hit-and-run motorcyclist travelling on the footway and striking a pedestrian; Ref. No. 38 involved a mobility scooter hitting a pedestrian after pressing the accelerator instead of the break. These two accidents involving pedestrians resulted in serious injury.

4.4.10 A summary of the accidents involving pedestrians, excluding the two discussed above, is provided below:

- Ref. No. 7, Serious: 8 year old pedestrian ran into path of oncoming vehicle;
- Ref. No. 21, Slight: Car reversed into parking space, colliding with pedestrian;
- Ref. No. 25, Slight: Pedestrian stationary on footway struck by reversing HGV;
- Ref. No. 31, Serious: An 85 year old pedestrian walked into the road without looking properly and struck by oncoming vehicle;
- Ref. No. 32, Slight: A 4 year old pedestrian ran into path of oncoming vehicle.

4.4.11 A summary of the accidents involving cyclists is provided below:

- Ref. No. 2, Slight: 13 year old cyclist struck by a car that failed to stop;
- Ref. No. 5, Serious: A car leaving a driveway failed to look properly and struck a 14 year old cyclist;
- Ref. No. 16, Slight: A car failed to give way to an cyclist travelling through a roundabout;
- Ref. No. 24, Slight: cyclist lost control, stopping for red light.

2011 Summary

4.4.12 A total of 41 accidents were recorded in 2011, resulting in 31 slight injuries, 10 serious injuries and no fatalities. The results showed that no accidents were a result of poor highway design / road conditions. The majority of accidents were caused by either poor driving / observation, the majority failing to give way to oncoming vehicles.

4.4.13 The following four accidents, one of which resulted in serious injury, can be discounted: Ref. No. 10 involved a person with mental health issues taking his carers vehicle without permission; Ref. No. 11 involved a driver experiencing a medical episode; Ref. No. 31 involved a faulty seat on a bus; Ref. No. 33 involved a bus driving off before a passenger had alighted, resulting in serious injury.

4.4.14 A summary of the accidents involving pedestrians is provided below:

- Ref. No. 15, Slight: a bus mounted the footway due to road works and struck pedestrian;
- Ref. No's 17 & 18, Slight: Pedestrians ran into the road without looking;
- Ref. No. 32, Slight: A car failed to see pedestrian crossing the road and struck them, failing to stop after the accident;
- Ref. No. 37, Serious: A car had stopped to let a pedestrian cross and was struck in the rear by another vehicle, pushing it into the pedestrian;
- Ref. No. 39, Serious: A car leaving a driveway failed to look properly and struck a pedestrian running along footway;
- Ref. No. 40, Slight: An elderly lady crossing the road was startled by a car passing at high speed and fell over.

4.4.15 A summary of the accidents involving cyclists is provided below:

- Ref. No. 3, Serious: Cyclist struck by overtaking car;
- Ref. No. 4, Slight: car failed to see cyclist, driving into rear;
- Ref. No. 8, Serious: A car failed to give way to a cyclist travelling through a roundabout;
- Ref. No. 16, Slight: Car turning into car park failed to give way to cyclist;
- Ref. No. 19, Slight: Cyclist road into stationary car;
- Ref. No. 23, Slight: A car failed to give way to a cyclist travelling through a roundabout;
- Ref. No. 35, Slight: A taxi failed to look properly whilst entering road and failed to give way to a cyclist travelling on cycle lane;

2012 Summary

- 4.4.16 A total of 38 accidents were recorded in 2011, resulting in 29 slight injuries, 9 serious injuries and no fatalities. The results showed that no accidents were a result of poor highway design / road conditions. The majority of accidents were caused by vehicle shunts, caused by poor observation / driving.
- 4.4.17 Two of the accidents can be discounted, with one (Ref. No. 26 involving a parked car rolling off a driveway due to defective brakes and a road-rage accident involving a motorist having an altercation with a pedestrian, hitting and dragging the pedestrian along the road, resulting in slight injury (Ref. No. 28).
- 4.4.18 A summary of the accidents involving pedestrians, excluding the accident discussed above, is provided below:
- Ref. No. 1, Serious: Pedestrian walked into road from between parked cars and struck by oncoming vehicle
 - Ref. No. 4, Serious: A car overtook stationary refuse vehicle and struck refuse collector;
 - Ref. No. 9, Serious: Car entering Hart Plain Avenue struck pedestrian crossing the road;
 - Ref. No. 37, Slight: Car wing mirror struck pedestrian walking along footway.
- 4.4.19 A summary of the accidents involving cyclists is provided below:
- Ref. No. 17, Slight: Cyclist struck by HGV that overtook but then pulled back in due to road narrowing;
 - Ref. No. 31, Slight: Car door opened into path of cyclist.
 - Ref. No. 34, Slight: Overtaking car passed too close to cyclist.

Summary

- 4.4.20 In summary, analysis of the accident records has not identified any concerns with regard to the geometric design / layout of the local highway network or the frequency and severity of

accidents. Similarly, the data does not highlight any concerns with regard to the clustering of accidents at single junctions or locations within the study area.

- 4.4.21 The majority of accidents were caused by one or a combination of: poor driving manoeuvres, poor observation and excess speed.

5 Development Proposals

5.1 Development Scheme

- 5.1.1 The masterplan and schedule for the site is contained within **Appendix 1.1**. A total of 293 dwellings plus the existing farmhouse are proposed on the site, with the schedule summarised in **Table 5.1**.

Table 5.1: Housing Schedule

Dwelling Type	Dwelling Size (Bedrooms)	Dwelling Schedule		
		Private	Affordable	Total
Flat / Apartments	1	6	0	6
	2	24	30	54
House	2	32	29	61
	3	106	26	132
	4	37	4	41
Total	-	205	89	294

- 5.1.2 The proposals include 89 affordable units, 30% of the total units.

5.2 Pedestrian & Cycle Access

- 5.2.1 Good pedestrian and cycle access is provided across the site, with:
- A 4.0m wide shared foot and cycleway provided on the main access into the site from Eagle Avenue;
 - A 3.0m wide shared foot and cycleway is provided along the southern boundary of the site, providing good east to west connection across the site and to Woodcroft Primary School;
 - A 3.0m wide Bridleway, a diversion of the existing route, is provided across the site, providing north to south movement;
 - 1.8m wide footways across the site, providing good pedestrian access throughout.
- 5.2.2 The shared foot and cycleway along the site access road provides connection to Woodcroft Primary School, therefore benefiting both existing residents in neighbouring Wecock and future residents of the development. Road narrowing and a raised crossing point is also provided along the site access road in the vicinity of the school entrance. This is positioned adjacent to the existing footway that runs east to west along the site boundary, and therefore this again provides benefit to both existing and future residents in the area.

- 5.2.3 In addition to the pedestrian and cycle routes provided across the site, each property is to be provided with both long and short stay cycle parking. This will further encourage residents and visitors to travel by sustainable means and reduce the need to travel by car.
- 5.2.4 The Minor roads and cul-de-sacs within the development will be low trafficked and encourage low vehicle speeds, therefore providing good conditions for on-road cycling.

5.3 Cycle Parking Provision

- 5.3.1 The site cycle parking provision is to be provided in accordance with Havant Borough Councils 'Residential Parking and Cycle Provision' (Supplementary Planning Document, March 2010). The standards are summarised in **Table 5.2** below.

Table 5.2: Havant Borough Council Cycle Parking Standards

Number of Bedrooms	Cycle Standard (minimum, per unit)	
	Long Stay	Short Stay
1	1	1
2	2	1
3	2	1
4	2	1

- 5.3.2 The long stay cycle parking will be provided within garages, garden sheds or cycle stores. Where the cycle parking is to be provided in garages, the internal dimensions of garages will be in excess of the recommended 3.0m x 6.0m.
- 5.3.3 The short stay parking will be provided in the form of hoops.

5.4 Vehicle Access

- 5.4.1 The vehicular access into the site will be provided via Eagle Avenue, with the proposed access arrangement illustrated on **Drawing Number 21834/004/05a**.
- 5.4.2 The proposed access arrangement has been developed in consultation with HCC. A number of options were considered including kerbed island roundabout and signal junction. A proposed mini-roundabout layout selected for the following reasons:
- The layout will be consistent with the existing character of Eagle Avenue and the surrounding area, where a number of similar junctions are provided;
 - The junction has sufficient capacity to accommodate any future traffic flow related to possible future development of the adjacent sites. The introduction of traffic signals would have been unnecessary and caused delay to through flow along Eagle Avenue;
 - The junction will provide a traffic calming feature, with vehicles having to slow on approach to the junction.

- 5.4.3 As illustrated on Drawing Number 21834/004/05b, the new access results in the removal of the bus lay-by to the east and the slight repositioning of the stop.

5.5 Internal Vehicle Access Arrangement

- 5.5.1 The site masterplan is contained within Appendix 1.1. This shows that the site access road from Eagle Avenue connects to a main spine road that provided centrally through the site, providing eastbound and westbound connection. These routes have a width of 6.0m, which is sufficient for a car and bus to pass, should buses be routed through the development in the future.
- 5.5.2 The secondary connecting roads all have a minimum width of 4.8m, which is sufficient for a car and refuse vehicle / HGV to pass. Some of these secondary roads have localised widening to 6.0m in areas where perpendicular car parking is provided along the side of the roads.
- 5.5.3 Vehicle tracks have been completed to ensure that the site is accessible by refuse vehicles, with these illustrated on **Drawing Number 21834/004/007**. It has also been ensured that suitable visibility is provided across the site, with this illustrated on **Drawing Number 21834/004/008**.
- 5.5.4 The road layout has been designed to keep speeds low. The nature of the site layout will mean that vehicle speeds will be limited naturally, with features designed in appropriately. These include a raised pedestrian crossing on the main access road (providing enhanced pedestrian access to Woodcroft Primary School), a raised junction table on entrance to the site, a raised crossing at the point the bridleway crosses the access road and a raised table junction on the main access road to the centre of the site.
- 5.5.5 Furthermore, there will be distinct changes in the surface treatment of the roads, separating the main and secondary roads and this should further distinguish the change in the nature of the area and lead to a further reduction in speed.

5.6 Car Parking Provision

- 5.6.1 The site car parking provision is to be provided with reference to Havant Borough Councils 'Residential Parking and Cycle Provision'. These standards and the level of parking based on the proposed schedule of housing is summarised in Table 5.3.

Table 5.3: Havant Borough Council Car Parking Standards and Proposed Site Parking Provision

Number of Bedrooms	Maximum Car Parking Standard (per unit)		Total Units	Maximum Permitted Spaces	
	Allocated	Unallocated		Allocated	Unallocated
1	1	0.9	6	6	5
2	2	1.3	115	230	150
3	2	1.9	132	264	251
4	3	2.4	41	123	98
Total	-	-	294	623	504

- 5.6.2 Table 5.3 shows that the level of parking is dependent on whether allocated or unallocated parking is provided, with a range of between 504 and 623 spaces.
- 5.6.3 A total of 596 spaces are to be provided on the site, which is within this range. A plan illustrating the split in parking across the site is provided within Appendix 1.1.
- 5.6.4 A summary of the parking provision across the site is explained below:

Private Units

- 5.6.5 A total of 459 spaces are proposed for the 204 private units, with 407 of these being allocated and 52 spaces unallocated. Based on the schedule and all spaces being allocated, a total of 438 spaces would be permitted.
- 5.6.6 The provision of 459 spaces is therefore a slight over provision of 21 spaces, although this equates to just one additional space per 10 dwellings. In recent years it has been accepted that parking constraint at residential developments has not discouraged car use or ownership and low parking provision led to cluttered streets and verges, which were unsafe for pedestrians and cyclists and difficult for bus services to penetrate. This slight over provision is proposed to provide an additional level of visitor parking and to try to prevent cars from parking on-street that may create further safety concerns.

Affordable Units

- 5.6.7 All of the parking for the affordable units are to be unallocated, with 137 spaces provided which is slightly above the standard of 136 spaces based on the proposed schedule.

6 Development Impact Assessment

6.1 Introduction

- 6.1.1 This section provides detail on the forecast level of trips that the development will generate, the distribution of these trips and the likely impact that these movements will have on the local transport infrastructure. The assessment also considers whether any mitigation is required to accommodate the development trips to avoid any adverse impact on existing movement.

6.2 Agreed Development Trip Generation

- 6.2.1 The residential trip rate has been derived from the TRICS database. 'Mixed Private Housing' sites have been selected, which were surveyed since 2001. Only sites in England are considered, excluding sites in Greater London. In addition, one site within Yorkshire has also been removed as it appears to have unusually low person trip rates which would skew the average trip rates. It is therefore considered that these trip rates provide a robust basis for assessing the development.
- 6.2.2 A copy of the TRICS output is attached within **Appendix 6.1**, with a summary of the selected site detail provided within **Table 6.1**.

Table 6.1: TRICS Sites (Mixed Private Housing)

Reference	Description	Area	Location	Units	Travel Plan
CH-03-K-03	Mixed Housing, Macclesfield	Cheshire	Edge of Town	211	No
DC-03-K-03	Mixed Housing, Dorchester	Dorset	Edge of Town Centre	24	No
LN-03-K-01	Terraced / Flats, Lincoln	Lincolnshire	Suburban Area	56	No
RE-03-K-06	Semi-Detached / Flats, Reading	Reading	Edge of Town	44	No
ST-03-K-01	Mixed Housing, Stoke	Staffordshire	Suburban Area	162	No
ST-03-K-02	Terraced / Flats, Stoke	Staffordshire	Edge of Town	73	No
WO-03-K-03	Terraced / Flats, Worcester	Worcestershire	Suburban Area	103	No
WS-03-K-02	Mixed Housing, Crawley	West Sussex	Suburban Area	61	No

- 6.2.3 The selected sites result in the following average trip rates. Both person and vehicle trip rates have been summarised.

Table 6.2: Total Person Trip Rates and Site Generation

Peak	Arrival	Departure	Total
AM (0800-0900)	0.142	0.665	0.807
PM (1700-1800)	0.460	0.249	0.709

Table 6.3: Vehicle Trip Rates and Site Generation

Peak	Arrival	Departure	Total
AM (0800-0900)	0.113	0.391	0.504
PM (1700-1800)	0.298	0.172	0.470

- 6.2.4 It should be noted that none of the sites within the TRICS analysis had site Travel Plans. Therefore, and as discussed and agreed within PBA's scoping paper, it is considered realistic that a 10% reduction be applied to the vehicle trip rates contained within Table 6.3 to reflect the investment and commitment of the developer to provide a Travel Plan / Travel Behaviour Change measures. It should be noted that it has been agreed with the Highways Agency that this 10% reduction will not be applied for the A3(M) impact assessment, reflecting that there is greater opportunity to influence travel change with local trips, where walking and cycling is a reasonable alternative as well as bus use.
- 6.2.5 The 10% reduction in car trips reflects the investment and commitment to a travel plan and Travel Behaviour Change measures.
- 6.2.6 A Framework Travel Plan has been prepared to reflect this aspiration, as is discussed in section 7.1.
- 6.2.7 Further justification of the proposed 10% reduction is provided within the DfT Document 'Making Residential Travel Plans Work', with this stating that "An intensive smarter choices programme over 10 years could cut urban peak-hour traffic by 21% and off-peak traffic by 13%. Nationally, traffic volumes could fall by 11%".
- 6.2.8 Furthermore, a number of case studies provide further evidence that the 10% factor is realistic. The DfT set up the Sustainable Travel Towns project for 2004-2009, in Darlington, Peterborough and Worcester, and achieved a shift in car trips of 11%, 13%, and 12% respectively, this was further complemented by increased public transport, walking, and cycling trips.
- 6.2.9 The resultant vehicle trip generation level for the proposed 294 units is provided in **Table 6.4**.

Table 6.4: Agreed Traffic Generation (including 10% TP reduction)

Peak	294 Units		
	Arrival	Departure	Total
AM (0800-0900)	30	103	133
PM (1700-1800)	79	46	125

6.3 Development Traffic Distribution

- 6.3.1 PBA initially proposed to distribute the forecast development traffic based on the observed traffic flow patterns recorded during the completed survey work. However, at our meeting with the HA on 19th May 2011, it was requested that a comparison exercise be completed using Census 'Travel to Work' data. These two methods are discussed in the following sections.

6.4 Development Traffic Distribution – Method 1: Observed Flows

6.4.1 It is proposed that the development generated traffic flows be distributed based on the existing travel patterns in the local area, using the results of the completed surveys.

6.4.2 There are eight key cordon entry points into the study area, as summarised below and illustrated on **Figure 6.1**:

- Lovedean Lane (North of Frogmore Lane);
- Frogmore Lane;
- A3(N) Portsmouth Road;
- B2149 Dell Piece Way / A3(M) North;
- B2150(E) Hulbert Road / A3(M) South;
- A3(S) London Road;
- B2150(W) Hambledon Road; and
- Elettra Avenue Industrial Estate.

6.4.3 The results of the traffic surveys have been analysed to determine the proportion of trips travelling via these eight areas and the results are summarised in **Table 6.5**.

Table 6.5: Traffic Distribution Proportions

Cordon Entry Point	AM Peak				PM Peak			
	Inbound Trips		Outbound Trips		Inbound Trips		Outbound Trips	
1) Lovedean Lane	310	6.8%	202	4.2%	210	4.6%	289	6.1%
2) Frogmore Lane	367	8.1%	284	5.9%	230	5.1%	308	6.5%
3) A3(N) Portsmouth Road	213	4.7%	226	4.7%	254	5.6%	217	4.6%
4) B2149 Dell Piece Way / A3(M) North	311	6.8%	662	13.8%	731	16.1%	320	6.7%
5) B2150(E) Hulbert Road / A3(M) South	1119	24.6%	1289	27.0%	1298	28.6%	1075	22.6%
6) A3(S) London Road	828	18.2%	1076	22.5%	906	20.0%	1125	23.7%
7) B2150(W) Hambledon Road	848	18.7%	784	16.4%	710	15.6%	751	15.8%
8) Elettra Avenue Industrial Estate	547	12.0%	258	5.4%	202	4.4%	670	14.1%
Total	4543	100%	4781	100%	4541	100%	4755	100%

6.5 Development Trip Distribution – Method 2: Census Data

6.5.1 At the request of the HA, the distribution of the development traffic has also been determined on the basis of 'Travel to Work' Census data from the Cowplain area.

6.5.2 A summary of the destinations of the travel to work trips is provided in the following table.

Table 6.6: Census Data (Including trips remaining within the Cowplain area)

Destination	Trips	Proportion
A3 (N)	93	1.7%
B2149 Dell Piece Way	119	2.2%
B2149 East of A3(M)	39	0.7%
A3(M) Jct 2 (N)	183	3.3%
Catherington Lane/Lovedean Lane (N)	27	0.5%
B2150 Hulbert Road E	639	11.6%
A3(S)	171	3.1%
A3(M) S Jct 3	72	1.3%
Either A3(S) or A3M J3 S	1758	31.9%
Elletra Avenue Ind Estate & SE Retail Park Area	765	13.9%
B2150 Hambledon Road (W)	99	1.8%
Local Trips	1541	28.0%
Total	5506	100.0%

6.5.3 The following table shows the destination proportions with the 'local trips' removed.

Table 6.7: Census Data (Excluding Local/Cowplain Trips)

Destination	Trips	Proportion
A3 (N)	93	2.3%
B2149 Dell Piece Way	119	3.0%
B2149 East of A3(M)	39	1.0%
A3(M) Jct 2 (N)	183	4.6%
Catherington Lane/Lovedean Lane (N)	27	0.7%
B2150 Hulbert Road E	639	16.1%
A3(S)	171	4.3%
A3(M) S Jct 3	72	1.8%
Either A3(S) or A3M J3 S	1758	44.3%
Elletra Avenue Ind Estate & SE Retail Park Area	765	19.3%
B2150 Hambledon Road (W)	99	2.5%
Total	3965	100.0%

- 6.5.4 Census data provides an understanding of the wider destinations of journey to work trips, but it does not consider other trip purposes (shopping, education, leisure, etc.) It should be highlighted that the Food Superstore on Dell Piece Way and the Elletra Avenue Industrial Estate / Retail Park Areas to the south-east of the site are key local destinations, and shopping trips to these would not be considered.
- 6.5.5 A comparison has been made between the two distribution methodologies, using the results of the observed traffic flows, and those extracted from analysis of the census data.
- 6.5.6 It should be noted that judgement has been made on the likely routing of the trips to the wider area. Trips to the south and south-east of the site may route via the A3 or the A3(M) and therefore these have been grouped together in the following table.

Table 6.8: Traffic Distribution Comparison

Cordon Entry Point	Proportions from Observed Flow Data (excluding local trips)		Census Data (excluding local trips)	Proportions from Observed Flow Data (including local trips)		Census Data (including local trips)
	AM Peak Departures	PM Peak Arrivals	-	AM Peak Departures	PM Peak Arrivals	-
LOCAL TRAFFIC	-	-	-	28.0%	28.0%	28.0%
1) Lovedean Lane	4.2%	4.6%	0%	3.0%	3.3%	0.0%
2) Frogmore Lane	5.9%	5.1%	0.7%	4.2%	3.7%	0.5%
3) A3(N) Portsmouth Road	4.7%	5.6%	2.3%	3.4%	4.0%	1.7%
4) B2149 Dell Piece Way / A3(M)	13.8%	16.1%	8.6%	9.9%	11.6%	6.2%
5) B2150(E) Hulbert Road / A3(M)	27.0%	28.6%	66.5%	19.4%	20.6%	47.9%
6) A3(S) London Road	22.5%	20.0%		16.2%	14.4%	
7) B2150(W) Hambledon Road	16.4%	15.6%	2.5%	11.8%	11.2%	1.8%
8) Elettra Avenue Industrial Estate / Retail Park	5.4%	4.4%	19.3%	3.9%	3.2%	13.9%
Total	100%	100%	100%	100%	100%	100%

- 6.5.7 The following observations have been made in comparing the trips travelling via the A3(M):

- Junction 2: The Census data indicates that 8.6% (or 6.2% including local traffic) of trips in the area travel via Dell Piece Way towards the A3(M), although only 7.6% travels through to Junction 2 as 1.0% of traffic has a destination at the Superstore on Dell Piece Way. This is a lower overall proportion than the 13.8% (or 9.9% including local traffic) calculated using the observed traffic flow;
- Junction 3: As previously discussed, and detailed in Table 6.7, there is a high proportion of trips (44.3% excluding local trips) where it is unclear whether this traffic would route via the A3 or A3(M) to their southern and south-eastern destinations. The 27.0% (AM) and 28.6% (PM) (or 19.4% (AM) and 20.6% (PM) including local trips) proportions derived from the observed traffic flow proportions are therefore considered realistic, especially as capacity/operation of the A3 / Maurepas Way / Hulbert Road junction constrains the level of traffic able to route from the Woodcroft Farm site to the A3(M) junction 3, as indeed does the A3 / Dell Piece Way junction constrain the level of trips able to travel to Junction 2 to the north.

6.6 Development Trip Distribution – Agreed Approach

- 6.6.1 Based on the above, it was suggested to the HA that the observed flow data including local trips is utilised for purposes of the transport assessment, as it is based upon all-purpose trips and peak hour trip distribution for the residential area adjacent to the site. This approach was subsequently agreed with the HA and HCC.
- 6.6.2 It should be noted that the average commuting trip is 8.6km compared to the average all-purpose trips at 6.6km. The average trip length for education, education escort and retail are 2.6km, 2.0km and 4.2km respectively. This indicates that the 28% of local trips based upon journey to work should be a conservative estimate of local trips, as there are likely to be more local trips made when considering other trip purposes.

6.7 Development Traffic Assignment

- 6.7.1 It has been necessary to assign the forecast development generated traffic flows across the local network to and from the eight cordon points.
- 6.7.2 A summary of the assignment routes for the eight destinations is provided in **Table 6.9**

Table 6.9: Traffic Assignment Routes

Routes into and out of Study Area	Route	Proportion using Route
1) Lovedean Lane	Eagle Ave - Milton Rd - Lovedean Ln	100.0%
2) Frogmore Lane	Eagle Ave - Milton Rd - Lovedean Ln - Frogmore Ln	100.0%
3) A3(N) Portsmouth Road	Eagle Ave - Milton Rd - Lovedean Ln - A3	100.0%
4) B2149 Dell Piece Way / A3(M) North	Eagle Ave - Milton Rd - Lovedean Ln - A3 - B2149	100.0%
5) B2150(E) Hulbert Road / A3(M) South	Eagle Ave (N) - Milton Rd - Durley Ave - A3 - B2150	5.0%
	Eagle Ave (N) - Milton Rd - Silvester Rd - A3 - B2150	5.0%
	Eagle Ave (N) - Milton Rd - Hart Plain Ave - A3 - B2150	5.0%
	Eagle Ave (N) - Milton Rd - B2150	35.0%
	Eagle Ave (S) - Milton Rd - Hart Plain Ave - A3 - B2150	15.0%
	Eagle Ave (S) - Milton Rd - B2150	35.0%
6) A3(S) London Road	Eagle Ave (N) - Milton Rd - B2150 - A3	50.0%
	Eagle Ave (S) - Milton Rd - B2150 - A3	50.0%
7) B2150(W) Hambledon Road	Eagle Ave (N) - Milton Rd - Sunnymead Dr - B2150	50.0%
	Eagle Ave (S) - Milton Rd - Sunnymead Dr - B2150	50.0%
8) Elettra Avenue Industrial Estate	Eagle Ave (N) - Milton Rd - Ind Estate	50.0%
	Eagle Ave (S) - Milton Rd - Ind Estate	50.0%

- 6.7.3 Table 6.9 shows that four of the eight loading points, all to the north of the site, have single assignment routes along which all traffic to/from these areas travel.
- 6.7.4 It has been assumed that all traffic to/from zones 1 to 4, to the north of the site will travel via Eagle Avenue (N) rather than Eagle Avenue (S) / Hart Plain Avenue as the route offers a shorter travel distance. For zones 1 & 2, it has been assumed that the traffic will route via Lovedean Lane (W) and traffic to zones 3 & 4 will travel via Lovedean Lane (E) – A3 London Road. It has been assumed that no traffic travelling to/from zone 2 will route via the A3 / Dell Piece Way Roundabout.
- 6.7.5 For the remaining zones to the south of the site, it has been assumed that there will be an even proportion of traffic travelling via Eagle Avenue (N) and Eagle Avenue (S)/Hart Plain Avenue. This is because of the small difference in journey length between the two routes, with the distance from the site access to the Milton Road / Hart Plain Avenue junction being 1,750m and 1,650m via the Eagle Avenue (N) and Eagle Avenue (S)/Hart Plain Avenue routes respectively.
- 6.7.6 Following this initial assignment assumption for the southbound routes, there are clear single route options for zones 6, 7 and 8. However, there are a number of route options for traffic travelling to/from zone 5:
- For the traffic travelling via Eagle Avenue north it was assumed that 70% would route via Milton Road – Hambledon Road, with the remaining traffic 'rat-running' equally through Durley Avenue, Silvester Road and Hart Plain Avenue (E) to gain access to the A3 London Road. It was assumed that no traffic would route via Longwood Avenue due to the length and deviation of this road as compared to the other options;

- For the traffic travelling via Eagle Avenue South / Hart Plain Avenue, it has been assumed that 70% of the traffic would route via Milton Road – Hambledon Road, with the remaining traffic travelling via Hart Plain Avenue (E) – A3 London Road.

6.7.7 The resultant development generated traffic flows for the AM and PM peak periods are illustrated on **Figures 6.2** and **6.3** respectively.

6.8 Network Assessment Methodology

Agreed Years of Assessment

- 6.8.1 As discussed and agreed within PBA's scoping paper, and in accordance with the Department for Transport's Transport Assessment Guidance, the network assessment tests will be completed for a forecast year of 5 years post application for the local road network (2018), with the trunk road also assessed for 10 years post application.
- 6.8.2 The NTM Converted Local Growth rates (car drivers) to be used to factor the observed 2010 traffic flows and the A3(M) year 2012 flows are summarised in **Table 6.10**.

Table 6.10: NTM Converted Local Growth Rates (TEMPRO 62)

Years	AM Peak (0700-1000)	PM Peak (1600-1900)	Average Weekday
Waterlooville (main) – Urban All			
2010 - 2018	1.1267	1.1316	1.1342
Havant Authority – Urban Trunk			
2012 – 2018	1.1088	1.1122	1.1141

- 6.8.3 The committed and allocated development sites in the local area are included within the growth factor derived using TEMPRO. The NTM Converted Local Growth Rates are therefore a capped level of growth.
- 6.8.4 Therefore, to derive the future baseline traffic levels (without Woodcroft Farm development flows) the forecast site traffic generation has been removed from the resultant growthed traffic. Waterlooville (main) urban area all roads factors have been applied to Hampshire's road network and Havant Borough urban trunk road factors will be applied to the A3(M) junctions.
- 6.8.5 It should be noted that the TEMPRO data is not specific with regards to the exact locations of the committed / identified housing developments within Havant. Therefore, for robustness, it is not proposed to remove the forecast level of Woodcroft Farm development generated traffic from the growthed baseline traffic levels along and to/from the Eagle Avenue, Milton Road and Sunnymead Drive corridors.

6.9 Link Impact

- 6.9.1 The percentage impact that the proposed development has on the existing flows on the network are illustrated on **Tables 6.11** and **6.12** for the Milton Road – Lovedean Lane and A3 London Road – Hambledon Road corridors respectively.

Table 6.11: Development Impact on Milton Road – Lovedean Lane Corridor, Year 2018

Junction / Link		AM Peak				PM Peak			
		Dev Trips	Base	Base + Dev	% Increase	Dev Trips	Base	Base + Dev	% Increase
Lovedean Lane / Woodbury Grove	Lovedean Lane (S)	4	227	231	1.93%	3	331	334	0.84%
	Woodbury Grove	0	10	10	0.00%	0	2	2	0.00%
	Lovedean Lane (N)	2	337	339	0.61%	4	234	238	1.56%
	Junction Total	6	574	580	1.12%	6	567	574	1.13%
Lovedean Lane / Frogmore Lane	Lovedean Lane (N)	2	347	349	0.59%	4	234	238	1.56%
	Frogmore Lane	2	314	317	0.77%	4	166	170	2.41%
	Lovedean Lane (S)	11	419	429	2.51%	6	553	559	1.03%
	Junction Total	15	1080	1095	1.39%	13	953	966	1.40%
Lovedean Lane / Woodcroft Lane	Lovedean Lane (S)	11	464	474	2.27%	6	585	591	0.98%
	Woodcroft Lane	0	47	47	0.00%	0	40	40	0.00%
	Lovedean Lane (N)	4	652	657	0.68%	8	387	395	1.97%
	Junction Total	15	1164	1179	1.29%	13	1012	1025	1.32%
Lovedean Lane / Milton Road	Lovedean Lane (E)	3	305	309	1.13%	17	477	495	3.58%
	Milton Road	30	486	515	6.12%	11	528	539	2.06%
	Lovedean Lane (W)	4	684	688	0.65%	8	423	431	1.80%
	Junction Total	38	1475	1512	2.55%	36	1429	1464	2.49%
Milton Road / Eagle Avenue	Milton Road (S)	11	390	401	2.82%	27	499	526	5.42%
	Eagle Avenue	67	221	287	30.16%	28	136	164	20.74%
	Milton Road (N)	8	612	620	1.29%	25	517	542	4.78%
	Junction Total	85	1222	1308	6.99%	80	1152	1232	6.94%
Milton Road / Durley Avenue	Milton Road (N)	37	768	805	4.80%	17	513	531	3.38%
	Durley Avenue	0	87	87	0.42%	1	85	86	1.33%
	Milton Road (S)	11	353	363	3.01%	26	797	823	3.25%
	Junction Total	48	1208	1256	3.96%	44	1395	1439	3.18%
Milton Road / Hart Plain Avenue (W)	Milton Road (S)	21	581	603	3.66%	52	1007	1059	5.15%
	Hart Plain Avenue (W)	37	279	316	13.19%	17	161	179	10.73%
	Milton Road (N)	34	759	793	4.49%	16	571	587	2.85%
	Oak Close	0	5	5	0.00%	0	2	2	0.00%
	Junction Total	92	1625	1717	5.67%	85	1742	1828	4.91%
Milton Road / Pyrford Close	Milton Road (S)	21	624	645	3.41%	52	976	1027	5.31%
	Pyrford Close	0	113	113	0.00%	0	85	85	0.00%
	Milton Road (N)	71	971	1042	7.30%	34	650	683	5.17%
	Junction Total	92	1708	1800	5.40%	85	1710	1796	5.00%
Milton Road / Hart Plain Avenue (E)	Milton Road (N)	71	1040	1111	6.82%	34	641	674	5.25%
	Hart Plain Avenue (E)	1	186	187	0.79%	5	59	63	7.66%
	Milton Road (S)	20	462	482	4.28%	47	926	973	5.11%
	Junction Total	92	1688	1780	5.46%	85	1625	1711	5.26%
Milton Road / Sunnymead Drive	Milton Road (S)	14	301	315	4.72%	35	790	825	4.43%
	Sunnymead Drive	6	246	251	2.27%	12	217	230	5.67%
	Milton Road (N)	65	776	842	8.42%	32	549	581	5.75%
	Junction Total	85	1323	1408	6.44%	79	1556	1635	5.07%

Table 6.12: Development Impact on London Road – Hambledon Road Corridor, Year 2018

Junction / Link		AM Peak				PM Peak			
		Dev Trips	Base	Base + Dev	% Increase	Dev Trips	Base	Base + Dev	% Increase
A3 / Dell Piece Way Roundabout	A3 Portsmouth Road (N)	1	495	497	0.28%	4	444	448	0.99%
	Dell Piece Way	2	621	623	0.33%	13	1367	1380	0.93%
	A3 London Road (S)	19	1127	1146	1.71%	5	735	740	0.70%
	Catherington Lane	0	566	566	0.00%	0	290	290	0.00%
	Junction Total	23	2808	2831	0.81%	22	2836	2859	0.78%
A3 London Road / Lovedean Lane Junction	A3 London Road (S)	0	534	534	0.00%	0	633	633	0.00%
	Lovedean Lane	19	477	497	4.02%	5	308	313	1.67%
	A3 London Road (N)	3	632	635	0.55%	17	974	991	1.76%
	Prochurch Road	0	35	35	0.00%	0	5	5	0.00%
	Junction Total	23	1678	1700	1.35%	22	1919	1942	1.16%
A3 London Road / Durley Avenue Junction	A3 London Road (S)	0	558	558	0.07%	1	824	825	0.14%
	Durley Avenue	1	135	136	1.03%	1	143	144	0.36%
	A3 London Road (N)	0	861	861	0.00%	0	709	709	0.00%
	Junction Total	2	1553	1555	0.11%	2	1677	1678	0.10%
A3 London Road / Silvester Road Junction	A3 London Road (S)	1	617	618	0.12%	2	882	884	0.26%
	Silvester Road	1	220	222	0.63%	1	223	224	0.23%
	A3 London Road (N)	1	1009	1011	0.14%	1	602	602	0.09%
	Junction Total	4	1847	1850	0.19%	3	1707	1711	0.19%
A3 London Road / Hart Plain Avenue (E) Junction	A3 London Road (S)	2	639	641	0.35%	7	911	918	0.74%
	Hart Plain Avenue (E)	6	374	380	1.49%	2	230	232	0.89%
	A3 London Road (N)	3	984	986	0.28%	1	511	512	0.20%
	Junction Total	11	1997	2008	0.53%	10	1652	1662	0.60%
A3 London Road / B2150 Hulbert Road Roundabout	A3 Maurepas Way	20	1231	1251	1.59%	7	1438	1445	0.50%
	A3 London Road	8	1177	1185	0.71%	3	712	715	0.43%
	B2150 Hulbert Road	7	1341	1348	0.55%	23	1574	1597	1.43%
	Junction Total	35	3749	3784	0.94%	33	3724	3757	0.88%
A3 Maurepas Way / Hambledon Road Roundabout	A3 Maurepas Way (E)	5	2101	2106	0.25%	16	1686	1702	0.94%
	A3 Maurepas Way (S)	5	1017	1023	0.54%	16	1135	1151	1.39%
	Hambledon Road	43	1452	1495	2.95%	18	1837	1855	0.98%
	Waterlooville MDA	0	287	287	0.00%	0	148	148	0.00%
	Junction Total	53	4570	4623	1.17%	49	4658	4708	1.06%
Hambledon Road / Ellettra Avenue Roundabout	Hambledon Road (E)	11	1150	1161	0.92%	32	1618	1650	1.95%
	Ellettra Avenue	4	291	294	1.24%	4	755	758	0.46%
	Hambledon Road (W)	0	1014	1014	0.00%	0	607	607	0.00%
	Milton Road	48	749	798	6.46%	24	451	475	5.41%
	Junction Total	63	3204	3267	1.95%	59	3430	3490	1.73%
Hambledon Road / Sunnymead Drive Junction	Hambledon Road (W)	6	955	961	0.58%	12	791	803	1.56%
	Sunnymead Drive	17	283	300	6.00%	7	172	179	4.19%
	Hambledon Road (E)	0	660	660	0.00%	0	793	793	0.00%
	Junction Total	23	1898	1921	1.19%	20	1756	1775	1.11%

- 6.9.2 The above tables show the negligible impact that the proposed development has on existing traffic flow volumes across the study area, with the impact being less than 5% at the majority of junctions. The impact is greatest at the junctions along the Milton Road and Lovedean Lane corridor, as would be expected. The impact reduces further away from the site, with increases of no more than 2% along the A3 London Road – Hambledon Road corridor.

6.10 Local Network Junction Assessment

- 6.10.1 The traffic flows used in the year 2018 junction assessments are illustrated on the following Figures:

- **Figure 6.4:** Year 2018 Baseline Flows, AM Peak;
- **Figure 6.5:** Year 2018 Baseline Flows, PM Peak;
- **Figure 6.6:** Year 2018 With Development Flows, AM Peak;
- **Figure 6.7:** Year 2018 With Development Flows, PM Peak.

- 6.10.2 The results of the completed assessments are summarised within tables contained within **Appendix 6.2**, with the result files attached to the cd.

- 6.10.3 These summaries show that the predicted generated traffic to/from the Woodcroft Farm development has a marginal impact on the operation of the majority of junctions. However, the assessments did identify some operational concerns at certain junctions and these are discussed below.

- 6.10.4 **Lovedean Lane/Milton Road Junction:** The results of the assessment of this priority controlled junction shows that it will operate at its theoretical operating capacity in the future without the development and slightly above its theoretical operating capacity with the addition of the development generated traffic. The assessments forecast the following maximum RFC values, on the Milton Road approach (minor road):

- 2018 Baseline Scenario: 0.99 (AM), 0.98 (PM):
- 2018 With Development Scenario: 1.06 (AM), 1.01 (PM):

- 6.10.5 The results show that the junction would operate at capacity regardless of the Woodcroft Farm development and therefore would need to be upgraded in advance of any development at Woodcroft Farm.

- 6.10.6 Potential mitigation measures have been explored and a mini-roundabout layout has been identified, as illustrated on **Drawing Number 21834/004/SK001**. The ARCADY results for the year 2018 with development scenario are provided in **Table 6.13**.

Table 6.13: Lovedean Lane/Milton Road: Proposed Mini-Roundabout (2018 With Development)

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Lovedean Lane (E)	0.50	1	0.70	2
Milton Road	0.72	2	0.78	3
Lovedean Lane (W)	0.93	10	0.57	1

- 6.10.7 This is considered as being a robust assessment, as ARCADY has often been found to underestimate the capacities at mini-roundabouts. The results presented above indicate that a mini-roundabout would operate within capacity and shows an operational improvement compared to the year 2018 baseline assessment with the existing traffic flows.
- 6.10.8 It should be noted that an increase in traffic on the Milton Road would balance the traffic flows and improve the operation.
- 6.10.9 **Milton Road/Eagle Avenue Junction:** The ARCADY assessment indicates the mini-roundabout junction would operate within capacity with the year 2018 baseline and with development scenario, with maximum RFC values of 0.86 and 0.89 respectively.
- 6.10.10 In order to provide further confidence that the existing mini-roundabout junction would operate within capacity, a priority junction has been tested as an alternative (which would generally be considered as a downgrade). The results of this assessment are summarised within **Table 6.14**.

Table 6.14: Milton Road/Eagle Avenue, PICADY Results (2018 With Development)

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eagle Avenue	0.35	0.54	0.20	0.24
Milton Road (N)	0.30	0.74	0.34	0.82

- 6.10.11 This shows that the priority junction would operate within capacity and therefore it is likely that the ARCADY assessment is under estimating capacity. It is assumed that HCC would not want to downgrade the junction.
- 6.10.12 **Milton Road/Hart Plain Avenue (East) Junction:** The PICADY assessment indicates the priority controlled junction would operate within capacity in 2018 without the development, with an RFC value of 0.78 during the AM peak period. The addition of the development traffic increases the RFC value to 0.85, with a queue of just 5 vehicles.
- 6.10.13 The operation of this junction could potentially be improved by changing the junction to a mini-roundabout. However, the left turn from the Hart Plain Avenue arm is currently banned, presumably to prevent vehicles rat-running through Milton Road between London Road and Hambledon Road. It is therefore recommended that on this basis and as the junction operates with a maximum RFC of 0.85 the current junction arrangement is retained.
- 6.10.14 It should be noted that due to the banned left turn from Hart Plain Avenue, the 13% growth applied to this approach is considered unrealistically high and operation is likely to be better than modelled.
- 6.10.15 **A3 London Road/Dell Piece Way:** The results of the baseline assessments show the junction to be operating with a maximum DoS of 95% during the AM peak period and 83% during the PM peak period. The addition of the Woodcroft Farm development generated flow has a limited impact with the maximum DoS increasing by just 1% to 96% during the AM peak and increasing from to 84% during the PM peak. It is considered that this impact will be imperceptible.
- 6.10.16 **A3 London Road/Durley Avenue Junction:** The assessment results show that the junction would operate within capacity. With the 2018 baseline assessment the junction is operating with maximum DoS of 73% and 88% during the AM and PM peak periods respectively. The

addition of the Woodcroft Farm development traffic has a negligible impact, increasing the DoS levels by less than 1% during both the AM and PM peak periods.

- 6.10.17 **A3 London Road/Hart Plain Avenue (E):** During the AM peak period in 2018, the model shows the junction is forecast to operate with an RFC of 0.87. The addition of the development traffic increases this to 0.89. The addition of the development generated traffic has a negligible impact on operation, with just 11 vehicles passing through the junction.
- 6.10.18 As previously discussed, the left turn movement to Milton Road has been banned at the western end of Hart Plain Avenue and due to this restriction, the 13% growth that has been applied to the baseline flows is not considered realistic and the junction will therefore operate at an improved level than that forecast by the assessment.
- 6.10.19 The junction operates well during the PM peak hour, with a maximum RFC value of 0.57 for the with development assessment.
- 6.10.20 **A3 London Road/B2150 Hulbert Road Roundabout:** The 2018 assessment results show the junction will operate with an RFC value of 0.85 during the PM peak period and a queue of 6 vehicles. The addition of the development traffic is shown to have a negligible impact, increasing the RFC value by 0.01 to 0.86, with no increase in queue levels.
- 6.10.21 **Hambledon Road/Milton Road Roundabout:** The results show the roundabout to be operating at its theoretical operating capacity in 2018 during AM peak period, with a maximum RFC value of 0.99 forecast on the Milton Road approach. The additional of the development traffic increases this to 1.05.
- 6.10.22 There is potential to provide capacity increases at the roundabout through localised widening on the Milton Road approach. This would increase the number of lanes on entry from one to two, and result in the junction operating within capacity with the development generated traffic, with a maximum RFC value of 0.67. The potential improvement to the layout is illustrated on **Drawing Number 21834/004/003**.
- 6.10.23 **Hambledon Road/Sunnymead Drive:** The results of the baseline tests show that this junction would operate above capacity during the AM peak period with the baseline flows, with a maximum RFC values of 1.15 forecast on the Sunnymead Drive approach. The additional development traffic increases this to 1.22.
- 6.10.24 The impact of the Woodcroft Farm development on this junction is minimal, with 17 development generated trips travelling from Sunnymead Drive during the AM peak period and just 7 during the PM peak period.
- 6.10.25 The Waterlooville MDA development to the west of Hambledon Road has invested in the recent introduction of a signalised junction to the north of the junction and also the installation of a TOUCAN pedestrian crossing to the south of the junction. These facilities will create gaps in the traffic to allow vehicles to leave the minor Sunnymead Drive arm of this junction. However, this cannot be tested in PICADY and therefore the results do not reflect this.

Result Summary

- 6.10.26 The results of the assessments demonstrate the marginal impact that the proposed development has on the operation of the surrounding highway network. This is unsurprising due to the volume of trips that it is forecast will be generated by the proposed development.
- 6.10.27 The completed assessment work has shown that with the exception of Milton Road/Lovedean Lane junction, the local junctions along the Milton Road – Lovedean Lane corridor are all forecast to operate within capacity, without the need for junction modifications.

- 6.10.28 It will be necessary to upgrade the Milton Road/Lovedean Lane junction layout from a priority controlled junction to a mini-roundabout. However, it should be noted that the junction is predicted to operate at capacity in advance of any development at Woodcroft Farm and therefore improvements would need to be made regardless of the proposed development.
- 6.10.29 The results of the junction assessments completed along the London Road – Hambledon Road corridor show that generally the impact on the operation of the junctions is minimal with the addition of the proposed development flows.
- 6.10.30 The Hambledon Road / Sunnymead Drive priority controlled junction is predicted to operate above it's theoretical operating capacity in 2018, with the minor arm (Sunnymead Drive) being above capacity. However, the identified improvement work to the Milton Road roundabout could offer relief to this junction to accommodate additional development generated traffic.
- 6.10.31 HCC has committed to reallocate road space along the A3 corridor to benefit public transport, therefore it is considered that any significant highway improvements above those identified above, could undermine these enhancements and detract from the attractiveness of the bus route.

6.11 Site Access Junction Operation

- 6.11.1 The proposed mini-roundabout site access from Eagle Avenue, as illustrated on **Drawing Number 21834/004/05a**, has been assessed in 2018 with development traffic flows for the AM and PM peak periods and the results are summarised in **Table 6.15**.

Table 6.15: Site Access Junction Operation, Year 2018 With Development

Link	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eagle Avenue (N)	0.25	0	0.18	0
Eagle Avenue (S)	0.14	0	0.06	0
Site Access	0.27	0	0.35	1

- 6.11.2 The results show that the site access is forecast to operate well within capacity with maximum RFC values of 0.27 and 0.35 during the AM and PM peak periods respectively.

6.12 A3(M) Assessment (Junctions 2 & 3)

- 6.12.1 Traffic flow data for Junctions 2 and 3 of the A3(M) have been extracted from the Highways Agency TRADS website and the data is attached within **Appendix 6.3**. Flow data was extracted from the neutral months of September and October 2012. This is the most up to date data currently available from the TRADS website for neutral months. 2012 AM and PM peak hour flows are illustrated on **Figures 6.8** and **6.9** respectively, with the year 2018 flows illustrated on **Figure 6.10**.
- 6.12.2 A summary of the level of Woodcroft Farm development related traffic that is estimated to travel via junctions 2 and 3 of the A3(M) during the peak periods is provided within **Table 6.16**. These flows do not include the 10% Travel Plan reduction

Table 6.16: Development Traffic Flows to A3(M) Junction 2 – 294 Units

	Junction 2		Junction 3	
	AM (0800-0900)	PM (1700-1800)	AM (0800-0900)	PM (1700-1800)
Inbound	2	14	8	26
Outbound	16	3	32	8
Total	18	17	40	34

6.12.3 The Design Manual for Roads and Bridges provides design guidance on the Layout of Grade Separated Junctions (Volume 6, Section 2: Part 1 TD22/06). This includes design charts setting out the merge and diverge lane requirement for motorways based on the merge/diverge and mainline traffic flows.

6.12.4 There are seven merge lane types available (A to G), with Type A being the most simple arrangement. The Type A 'Taper Merge' arrangement is currently provided at both of the A3(M) junctions. A summary of the 7 types of merge arrangements is provided below:

- A: Taper Merge;
- B: Parallel Merge;
- C: Ghost Island Merge;
- D: Two-Lane Urban Merge;
- E: Lane Gain;
- F: Lane Gain with Ghost Island Merge;
- G: 2 Lane Gain with Ghost Island.

6.12.5 There are five diverge lane types available (A to E), with Type A being the most simple arrangement. The Type A 'Taper Diverge' arrangement is currently provided at both of the A3(M) junctions. A summary of the 5 types of diverge arrangements is provided below:

- A: Taper Diverge;
- B: Ghost Island or Parallel Diverge;
- C: Lane Drop at Taper Diverge;
- D: Ghost Island Diverge for Lane Drop or Lane Drop at Parallel Diverge.
- E: 2 Lane Drop.

Junction 2 Analysis

- 6.12.6 The 2012 AM and PM peak hour traffic flows recorded travelling through Junction 2 are summarised in **Table 6.17**. These flows have been plotted onto the design charts. **Figure 6.11** illustrates the merge requirement and **6.12** the diverge requirement.

Table 6.17: Existing A3(M) Junction 2 Traffic Flows and Merge / Diverge Lane Requirement – Year 2012

	Peak	Merge / Diverge Flow	Mainline Flow	Merge / Diverge Requirement
Northbound Merge	AM	634	1700	E
	PM	407	1590	E
Northbound Diverge	AM	509	1700	A
	PM	891	1590	A
Southbound Merge	AM	850	1640	E
	PM	707	2129	A or D
Southbound Diverge	AM	280	1640	A
	PM	597	2129	A

- 6.12.7 Currently, both the northbound and southbound merges are Type A: Taper Merge. However, based on the existing 2012 traffic flows both the northbound and southbound merge lanes should be a Type E: Lane Gain.
- 6.12.8 From the figures / design charts in Figures 6.11 and 6.12 it can be seen that the addition of the development traffic would not alter the design recommendation for the merges and diverges identified for the baseline flows, with the development flow increases being indistinguishable.
- 6.12.9 Both the northbound and southbound diverge are currently Type A: Taper Diverge. Based on the existing 2012 traffic flows, this arrangement is suitable when referenced against the DMRB design charts. The additional of the development generated traffic would be able to be accommodated by the Taper Diverges.

Future Year Assessment (Junction 2)

6.12.10 The 2012 traffic flows have been factored to year 2018 (using the growth rates from Table 6.10) and are illustrated on **Figures 6.13** to **6.14** and **Table 6.18** below.

Table 6.18: A3(M) Junction 2 Traffic Flows and Merge / Diverge Lane Requirement – Year 2018

	Peak	Merge / Diverge Flow	Mainline Flow	Merge / Diverge Requirement
Northbound Merge	AM	703	1885	A or D
	PM	453	1768	E
Northbound Diverge	AM	564	1885	A
	PM	991	1768	A
Southbound Merge	AM	942	1818	A or D
	PM	786	2368	A or D
Southbound Diverge	AM	310	1818	A
	PM	664	2368	A

6.12.11 The results show that a Type E merge is required in the northbound direction, with the remaining merge and diverge types required to be either Type A or D. Again, the increase in flow created by the proposed development would not impact on the design requirement, with the increases being indistinguishable on the design charts provided.

6.12.12 The HA requested that in order to consider the application they wished to understand the potential impact of the possible future extension of the site on the A3(M). This has been included in **Appendix 6.4**.

Junction 3 Analysis

6.12.13 The 2012 AM and PM peak hour traffic flows recorded travelling through Junction 3 are summarised in **Table 6.19**. These flows have been plotted onto the design charts. **Figure 6.15** illustrates the merge requirement and **Figure 6.16** the diverge requirement.

Table 6.19: Existing A3(M) Junction 3 Traffic Flows and Merge / Diverge Lane Requirement – Year 2012

	Peak	Merge / Diverge Flow	Mainline Flow	Merge / Diverge Requirement
Northbound Merge	AM	484	1627	E
	PM	262	2207	A or D
Northbound Diverge	AM	742	1627	A
	PM	1166	2207	A
Southbound Merge	AM	1156	2102	B
	PM	674	2016	A or D
Southbound Diverge	AM	502	2102	A
	PM	671	2016	A

6.12.14 Currently, both the northbound and southbound merges are Type A: Taper Merge. However, based on the existing traffic flows both the northbound merge lanes should be a Type E: Lane Gain, with the southbound merge being a Type B: Parallel Merge.

6.12.15 Both the northbound and southbound diverge are currently Type A: Taper Diverge. Based on the existing traffic flows this arrangement is suitable when referenced against the DMRB design charts. The additional development traffic would be accommodated by the Taper Diverges.

6.12.16 Again, from the figures it can be seen that the addition of the development traffic to the merge and diverge charts would not alter the design recommendation for the merges and diverges identified for the baseline flows, with the development flow increases being indistinguishable to the baseline plots provided.

Future Year Assessment (Junction 3)

6.12.17 The 2012 flows have been factored to year 2018 (using the growth rates from Table 6.10) and are illustrated on **Figures 6.17** and **6.18** and **Table 6.20** below.

Table 6.20: A3(M) Junction 3 Traffic Flows and Merge / Diverge Lane Requirement – Year 2018

	Peak	Merge / Diverge Flow	Mainline Flow	Merge / Diverge Requirement
Northbound Merge	AM	537	1804	A or D
	PM	291	2455	A or D
Northbound Diverge	AM	823	1804	A
	PM	1297	2455	C
Southbound Merge	AM	1282	2331	B
	PM	750	2242	A or D
Southbound Diverge	AM	557	2331	A
	PM	746	2242	A

6.12.18 The tables show that the flow increases result in differences to the merge / diverge requirements. The flow increases resulting in the existing Type A provision being acceptable for the northbound merge and southbound diverge but that a Type C diverge would be required in the northbound direction and a Type B merge in the southbound direction.

6.12.19 Regardless of the merge / diverge type recommendations provided by the charts, it can again be seen that the development related flows that are forecast to travel through the junction has no impact and the HA would need to take a view on whether upgrade works are required regardless of any level of development at the Woodcroft Farm site.

7 Identification of Impacts and Mitigation Measures

7.1 Travel Plan Measures

- 7.1.1 A Residential Travel Plan (RTP) has been completed for the site, which should be read in conjunction with this report.
- 7.1.2 A Residential Travel Plan (RTP) is a strategy to reduce the number of single occupancy car trips generated by a residential development, by encouraging the use of more sustainable forms of travel and/or by reducing the overall need to travel.
- 7.1.3 The RTP will ensure that the new residents of the development will be provided with information and incentives to use sustainable means of travel and also raise awareness of the local facilities that are available to them.
- 7.1.4 The main objectives of Residential Travel Plans are to:
- Address residents' needs for access to a full range of facilities for work, education, health, leisure, recreation and shopping;
 - Promote healthy lifestyles and sustainable, vibrant local communities;
 - Reduce the traffic generated by the development.
- 7.1.5 RTP's are especially effective in new developments as they target residents as they move into the area, when they are considering how they should travel to work, school, shops, etc. The majority of these residents will most likely be unfamiliar with the local area, including the public transport network, and the plan therefore provides all necessary local information regarding sustainable travel choices.
- 7.1.6 Examples of some of the Travel Plan measures are provided below:
- Welcome Packs will be provided to all new residents, with these providing:
 - Information on local public transport (routes, timetables, stop locations);
 - Information on walk and cycle routes;
 - Incentives for travelling by sustainable means;
 - A Travel Plan Coordinator will be appointed by the developer to oversee the implementation of the Travel Plan and remain in post for the construction period. The appointment will be part time but the nominated TPC should be "on call" when needed.
 - A Bicycle User Group (BUG);
 - Promotion of Car Share Schemes (i.e. gocarshare.com, Hantscarshare.com);
 - Provide detail on how the site will provide good pedestrian connection to local facilities, especially the links to Woodcroft Primary school;

- Provide detail on how the plan could link and benefit from the nearby MDA / Newlands site, including: supporting the improved 39 bus service; additional support to the potential provision of a car club; working in partnership with the travel plan coordinator on the Newlands site to further develop and support possible measures and initiatives.

7.2 Junction / Network Improvements

7.2.1 As detailed in previous sections of this report, the following potential network improvements have been identified:

- New Site Access: Provision of a mini-roundabout, delivering traffic calming.
- Lovedean Lane / Milton Road Junction: Provision of mini-roundabout junction to replace existing priority junction.
- Hambledon Road / Milton Road / Elletra Avenue Roundabout: Possible localised widening on Milton Road approach.

7.2.2 It should however be noted that PBA believe that only the Lovedean Lane / Milton Road modification is justified in terms of the impact that the Woodcroft Farm development generated traffic has on junction operation.

8 Conclusion

- 8.1.1 This Transport Assessment has been completed to understand the impact of the proposed development of 293 residential dwellings on Land at Woodcroft Farm, Havant and enable the identification of mitigation measures. The existing Farmhouse will be retained.
- 8.1.2 The site is identified as a Strategic Site within Havant Borough Council's Adopted Core Strategy for the development of up to 340 homes.
- 8.1.3 A Transport Scoping Report was submitted by Peter Brett Associates LLP to Hampshire County Council and the Highways Agency that set out the proposed methodology and content of this TA. This proposed approach has been agreed with both HCC and the HA.
- 8.1.4 A Framework Residential Travel Plan has been prepared for the site, demonstrating commitment from the developer to promote sustainable travel. This Travel Plan is a key element in enhancing the sustainability of the development, encouraging residents to by sustainable means such as walking, cycling or bus.
- 8.1.5 The development proposal will accord with national, regional and local policy guidance. Examples are given below:
- The site is located within walking distance of frequent bus services that provide access to a number of facilities, including local shopping centres, leisure facilities, employment areas and train stations;
 - The development will provide high quality footways throughout the site that will connect into the neighbouring pedestrian networks;
 - The site is within easy reach of numerous retail, employment, education and leisure facilities, offering the opportunity to reducing the need to depend on the car;
 - Car Parking levels will be provided in accordance with Havant Borough Council's parking standards;
 - S106 contributions to be provided in accordance with HCC Contribution Policy;
 - Internal access arrangement designed to reduce vehicle speeds at or below target speed of 20mph.
- 8.1.6 Good pedestrian and cycle access will be provided across the site, for example:
- A 4.0m wide shared foot and cycleway is provided on the main access into the site from Eagle Avenue;
 - A 3.0m wide shared foot and cycleway is provided along the southern boundary of the site, providing a east to west connection across the site and to Woodcroft Primary School;
 - A 3.0m wide Bridleway, a diversion of the existing route, is provided across the site, providing north to south movement;
 - 1.8m wide footways are provided across the site, with permeability provides throughout.

- 8.1.7 The shared foot and cycleway along the site access provides connection to Woodcroft Primary School, therefore benefiting both existing residents in the neighbouring Wecock Estate and future residents of the development. Road narrowing and a raised crossing point is also provided across the site access road in the vicinity of the school entrance. This is positioned adjacent to the existing footway that runs east to west along the site boundary, and therefore this again provides benefit to both existing and future residents.
- 8.1.8 In addition to the pedestrian and cycle routes provided across the site, each property will include both long and short stay cycle parking. This will further encourage residents and visitors to travel by sustainable means.
- 8.1.9 Although there are limited cycle lanes in the immediate surrounding area, quiet routes connect the site to cycle lanes that provide links to important destinations such as Waterlooville town centre, Ellettra Avenue Industrial Area and Waterlooville Leisure Centre.
- 8.1.10 A playground is to be provided at the centre of the site. The site is also located adjacent to a recreation ground that is located to the south and accessible via the existing footway. This includes a Multi-Use Games Area (MUGA) a Locally Equipped Area of Play (LEAP) and a skateboard ramp.
- 8.1.11 There is a local shopping centre on Milton Road, a 600 metre walking distance from the site. The facilities include a foodstore, pharmacy, restaurants and hairdressers. A wider selection of facilities is provided at nearby Cowplain Village on the A3 London Road and Waterlooville town centre.
- 8.1.12 There are a range of employment opportunities available in the local area, including: Waterlooville town centre, Ellettra Avenue Industrial Estate, Jubilee Business Park, and Hambledon Road Industrial Park.
- 8.1.13 The site is well placed in relation to public transport facilities, with high frequency bus services providing access to a number of key local and strategic destinations including Waterlooville, Havant, Hilsea Portsmouth and Cosham. The majority of the local facilities are also accessible via the bus services.
- 8.1.14 These local bus services also provide connection to Havant railway station, which provides connection to a number of destinations including Worthing, Southampton, Brighton, Gatwick Airport and London Waterloo and Victoria railway stations.
- 8.1.15 The completed junction assessment work demonstrates that the impact of the Woodcroft Farm development flows can be accommodated on the surrounding road network, with some improvements. Junction improvements may be required if the committed and future Waterlooville Major Development Area and Meadowlands were to be completed/delivered. A summary of the potential mitigation measures that have been identified is provided below:
- Lovedean Lane / Milton Road Junction: Provision of mini-roundabout junction to replace existing priority junction.
 - Hambledon Road / Milton Road Roundabout: Possible localised widening to provide additional capacity.

Figures

Drawings

Appendix 1.1 Site Masterplan & Schedule (Omega)

Appendix 1.2 PBA Transport Assessment Scope & HCC / HA Response

Appendix 3.1 CSL School Parking Survey, Eagle Avenue

Appendix 4.1 Traffic Survey Results (CD)

Appendix 4.2 Year 2010 Junction Assessment Result Summary

Junction Assessment Result Summaries: Lovedean Lane - Milton Road Corridor

Junction	Link	2010 Observed			
		AM Peak		PM Peak	
		RFC	Queue	RFC	Queue
Lovedean Lane / Woodbury Grove	Woodbury Grove	0.02	0	0.00	0
	Lovedean Lane (N)	0.00	0	0.00	0
Lovedean Lane / Frogmore Lane	Frogmore Lane	0.47	1	0.25	0
	Lovedean Lane (S)	0.33	1	0.39	1
Lovedean Lane / Woodcroft Lane	Woodcroft Lane	0.10	0	0.08	0
	Lovedean Lane (N)	0.02	0	0.00	0
Lovedean Lane / Milton Road	Milton Road	0.83	5	0.86	6
	Lovedean Lane (W)	0.74	3	0.49	1
Milton Road / Eagle Avenue	Milton Road (S)	0.52	1	0.71	2
	Eagle Avenue	0.30	0	0.24	0
	Milton Road (N)	0.75	3	0.65	2
Milton Road / Durley Avenue	Durley Avenue	0.17	0	0.20	0
	Milton Road (S)	0.12	0	0.25	1
Milton Road / Hart Plain Avenue (W)	Oak Close	0.01	0	0.01	0
	Milton Road (N)	0.04	0	0.11	0
	Hart Plain Avenue (W)	0.54	1	0.41	1
	Milton Road (S)	0.00	0	0.01	0
Milton Road / Pyrford Close	Pyrford Close	0.30	0	0.20	0
	Milton Road (N)	0.03	0	0.03	0
Milton Road / Hart Plain Avenue (E)	Hart Plain Avenue (E)	0.62	2	0.22	0
	Milton Road (S)	0.00	0	0.00	0
Milton Road / Sunnymead Drive	Sunnymead Drive	0.40	1	0.41	1
	Milton Road (N)	0.32	1	0.35	1

Junction Assessment Result Summaries: London Road - Hambledon Road Corridor

Junction	Link	2010 Observed			
		AM Peak		PM Peak	
		RFC	Queue	RFC	Queue
A3 / Dell Piece Junction	London Road (N) Ahead	67.60%	8	69.10%	10
	London Road (N) Right	5.50%	1	10.10%	1
	Dell Piece Left	38.10%	5	71.90%	13
	Dell Piece Way Right & Ahead	77.10%	7	69.90%	12
	London Road (S) Ahead Left	64.80%	11	59.40%	9
	London Road (S) Right	84.20%	24	49.80%	8
	Catherington Lane	87.30%	18	71.50%	7
Total Delay		45.58		34.88	
A3 London Road / Lovedean Lane Junction	Lovedean Lane	0.59	1	0.37	1
	A3 London Road (S)	0.00	0	0.01	0
	Prochurch Road	0.08	0	0.01	0
	A3 London Road (N)	0.29	0	0.65	2
A3 London Road / Longwood Avenue Junction	Longwood Avenue	0.38	1	0.21	0
	A3 London Road (N)	0.03	0	0.07	0
A3 London Road / Durley Avenue Junction	A3 London Road (W) Ahead & Left	52.80%	8	75.00%	15
	Durley Avenue	58.70%	4	76.40%	5
	A3 London Road (E) Right	62.80%	8	47.80%	6
	A3 London Road (E) Ahead	40.50%	2	46.70%	2
Total Delay		8.54		10.66	
A3 London Road / Silvester Road Junction	Silvester Road	0.46	1	0.41	1
	A3 London Road (N)	0.14	0	0.16	0
A3 London Road / Hart Plain Avenue (E) Junction	Hart Plain Avenue (E)	0.68	2	0.43	1
	A3 London Road (N)	0.20	0	0.11	0
A3 London Road / B2150 Hulbert Road Roundabout	B2150 Hulbert Road	0.68	2	0.72	3
	A3 Maurepas Way	0.42	1	0.54	1
	A3 London Road	0.38	1	0.23	0
A3 Maurepas Way / Hambledon Road Roundabout	A3 Maurepas Way (E)	0.62	2	0.52	1
	A3 Maurepas Way (S)	0.50	1	0.51	1
	Waterlooville MDA	0.19	0	0.11	0
	Hambledon Road	0.37	1	0.48	1
Hambledon Road / Milton Road / Elletra Avenue Roundabout	Hambledon Road (N)	0.54	1	0.48	1
	Milton Road	0.80	4	0.49	1
	Hambledon Road (S)	0.44	1	0.58	1
	Elletra Avenue	0.16	0	0.54	1
Hambledon Road / Sunnymead Drive Junction	Sunnymead Drive	0.89	7	0.52	1
	Hambledon Road (E)	0.09	0	0.26	1

Appendix 4.3 Electronic Copy of Assessment Result Files

[SEE APPENDIX 4.1]

Appendix 4.4 Vehicle Collision Records

Appendix 6.1 TRICS Data

Appendix 6.2 Year 2018 Junction Assessment Results

[SEE APPENDIX 4.1]

Junction Assessment Result Summaries: Lovedean Lane - Milton Road Corridor

Junction	Link	2010 Observed				2018 Baseline				2018 Baseline + Development (294 Units)			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Lovedean Lane / Woodbury Grove	Woodbury Grove	0.02	0	0.00	0	0.02	0	0.00	0	0.02	0	0.00	0
	Lovedean Lane (N)	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Lovedean Lane / Frogmore Lane	Frogmore Lane	0.47	1	0.25	0	0.53	1	0.28	0	0.54	1	0.28	0
	Lovedean Lane (S)	0.33	1	0.39	1	0.37	1	0.45	1	0.39	1	0.45	1
Lovedean Lane / Woodcroft Lane	Woodcroft Lane	0.10	0	0.08	0	0.11	0	0.10	0	0.11	0	0.10	0
	Lovedean Lane (N)	0.02	0	0.00	0	0.02	0	0.00	0	0.02	0	0.00	0
Lovedean Lane / Milton Road	Milton Road	0.83	5	0.86	6	0.99	18	0.98	18	1.06	42	1.01	26
	Lovedean Lane (W)	0.74	3	0.49	1	0.87	5	0.55	1	0.88	5	0.57	1
Milton Road / Eagle Avenue	Milton Road (S)	0.52	1	0.71	2	0.59	1	0.75	3	0.61	2	0.81	4
	Eagle Avenue	0.30	0	0.24	0	0.35	1	0.24	0	0.46	1	0.29	0
	Milton Road (N)	0.75	3	0.65	2	0.86	6	0.70	2	0.89	7	0.74	3
Milton Road / Durley Avenue	Durley Avenue	0.17	0	0.20	0	0.20	0	0.24	0	0.20	0	0.25	0
	Milton Road (S)	0.12	0	0.25	1	0.14	0	0.31	1	0.14	0	0.32	1
Milton Road / Hart Plain Avenue (W)	Oak Close	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0
	Milton Road (N)	0.04	0	0.11	0	0.05	0	0.13	0	0.05	0	0.13	0
	Hart Plain Avenue (W)	0.54	1	0.41	1	0.66	2	0.47	1	0.73	3	0.55	1
	Milton Road (S)	0.00	0	0.01	0	0.00	0	0.01	0	0.00	0	0.01	0
Milton Road / Pyrford Close	Pyrford Close	0.30	0	0.20	0	0.38	1	0.24	0	0.40	1	0.25	0
	Milton Road (N)	0.03	0	0.03	0	0.04	0	0.04	0	0.04	0	0.04	0
Milton Road / Hart Plain Avenue (E)	Hart Plain Avenue (E)	0.62	2	0.22	0	0.78	3	0.25	0	0.85	5	0.28	0
	Milton Road (S)	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Milton Road / Sunnymead Drive	Sunnymead Drive	0.40	1	0.41	1	0.47	1	0.46	1	0.49	1	0.50	1
	Milton Road (N)	0.32	1	0.35	1	0.38	1	0.40	1	0.45	1	0.43	1

Junction Assessment Result Summaries: London Road - Hambledon Road Corridor

Junction	Link	2010 Observed				2018 Baseline				2018 Baseline + Development (294 Units)			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
A3 / Dell Piece Junction	London Road (N) Ahead	67.60%	8	69.10%	10	90.30%	15	77.10%	11	90.70%	15	78.40%	12
	London Road (N) Right	5.50%	1	10.10%	1	6.20%	1	12.60%	2	6.10%	1	12.60%	2
	Dell Piece Left	38.10%	5	71.90%	13	43.30%	6	82.90%	20	43.10%	6	84.10%	21
	Dell Piece Way Right & Ahead	77.10%	7	69.90%	12	89.00%	10	77.00%	15	92.90%	11	78.00%	16
	London Road (S) Ahead Left	64.80%	11	59.40%	9	94.30%	17	68.60%	12	80.00%	18	67.90%	12
	London Road (S) Right	84.20%	24	49.80%	8	95.00%	32	61.90%	12	93.90%	33	61.40%	12
	Catherington Lane	87.30%	18	71.50%	7	94.30%	24	83.00%	10	96.40%	25	83.00%	10
	Total Delay	45.58		34.88		67.42		46.22		69.74		46.86	
A3 London Road / Lovedean Lane Junction	Lovedean Lane	0.59	1	0.37	1	0.71	2	0.51	1	0.76	3	0.54	1
	A3 London Road (S)	0.00	0	0.01	0	0.00	0	0.01	0	0.00	0	0.01	0
	Prochurch Road	0.08	0	0.01	0	0.10	0	0.01	0	0.10	0	0.01	0
	A3 London Road (N)	0.29	0	0.65	2	0.34	1	0.76	3	0.35	1	0.79	4
A3 London Road / Longwood Avenue Junction	Longwood Avenue	0.38	1	0.21	0	0.46	1	0.26	0	0.46	1	0.26	0
	A3 London Road (N)	0.03	0	0.07	0	0.04	0	0.08	0	0.04	0	0.08	0
A3 London Road / Durley Avenue Junction	A3 London Road (W) Ahead & Left	52.80%	8	75.00%	15	61.00%	10	86.90%	21	61.00%	10	87.00%	21
	Durley Avenue	58.70%	4	76.40%	5	67.20%	4	88.10%	6	67.70%	4	88.70%	7
	A3 London Road (E) Right	62.80%	8	47.80%	6	72.50%	12	55.50%	7	72.50%	12	55.50%	7
	A3 London Road (E) Ahead	40.50%	2	46.70%	2	46.70%	2	54.30%	3	46.70%	2	54.30%	3
	Total Delay	8.54		10.66		11.05		15.75		11.08		15.91	
A3 London Road / Silvester Road Junction	Silvester Road	0.46	1	0.41	1	0.57	1	0.51	1	0.58	1	0.51	1
	A3 London Road (N)	0.14	0	0.16	0	0.17	0	0.20	0	0.17	0	0.20	0
A3 London Road / Hart Plain Avenue (E) Junction	Hart Plain Avenue (E)	0.68	2	0.43	1	0.87	6	0.56	1	0.89	6	0.57	1
	A3 London Road (N)	0.20	0	0.11	0	0.24	0	0.13	0	0.24	0	0.13	0
A3 London Road / B2150 Hulbert Road Roundabout	B2150 Hulbert Road	0.68	2	0.72	3	0.81	4	0.85	6	0.82	4	0.86	6
	A3 Maurepas Way	0.42	1	0.54	1	0.49	1	0.65	2	0.49	1	0.66	2
	A3 London Road	0.38	1	0.23	0	0.46	1	0.28	0	0.46	1	0.28	0
A3 Maurepas Way / Hambledon Road Roundabout	A3 Maurepas Way (E)	0.62	2	0.52	1	0.71	2	0.61	2	0.71	2	0.62	2
	A3 Maurepas Way (S)	0.50	1	0.51	1	0.61	2	0.62	2	0.61	2	0.63	2
	Waterlooville MDA	0.19	0	0.11	0	0.22	0	0.13	0	0.22	0	0.13	0
	Hambledon Road	0.37	1	0.48	1	0.43	1	0.56	1	0.44	1	0.56	1
Hambledon Road / Milton Road / Elletra Avenue Roundabout	Hambledon Road (N)	0.54	1	0.48	1	0.62	2	0.59	1	0.63	2	0.60	2
	Milton Road	0.80	4	0.49	1	0.99	22	0.58	1	1.05	52	0.61	2
	Hambledon Road (S)	0.44	1	0.58	1	0.50	1	0.65	2	0.50	1	0.66	2
	Elletra Avenue	0.16	0	0.54	1	0.18	0	0.67	2	0.19	0	0.69	2
Hambledon Road / Sunnymead Drive Junction	Sunnymead Drive	0.89	7	0.52	1	1.15	42	0.63	2	1.22	58	0.66	2
	Hambledon Road (E)	0.09	0	0.26	1	0.11	0	0.33	1	0.11	0	0.33	1

Junction Assessment Result Summaries: Junction Mitigation

Type	Junction	Link	2018 Baseline + Development (294 Units)			
			AM Peak		PM Peak	
			RFC	Queue	RFC	Queue
Mini Roundabout	Lovedean Lane / Milton Road	Lovedean Lane (E)	0.50	1	0.70	2
		Milton Road	0.72	2	0.78	3
		Lovedean Lane (W)	0.93	11	0.57	1
Priority T-junction	Milton Road / Eagle Avenue	Eagle Avenue	0.35	1	0.20	0
		Milton Road (N)	0.30	1	0.34	1
Standard Roundabout	Hambledon Road / Milton Road	Hambledon Road (N)	0.63	2	0.60	2
		Milton Road	0.67	2	0.39	1
		Hambledon Road (S)	0.50	1	0.66	2
		Elletra Avenue	0.19	0	0.69	2

Appendix 6.3 TRADS Data

Appendix 6.4 A3(M) Assessment