

**BAE Systems**

**BAE Waterlooville**

**Transport Assessment Report**

**Project Ref: 26365/004**

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**June 2012**

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BAE Waterlooville  
Transport Assessment Report

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**BAE Waterloooville**  
**Transport Assessment Report**

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## **Appendices (provided on enclosed CD)**

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Appendix C: Personal Injury Collision Data  
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# **1 Introduction**

## **1.1 Background**

- 1.1.1** This Transport Assessment Report (TAR) has been prepared by Peter Brett Associates LLP (PBA) on behalf of BAE Systems (BAE) to accompany an outline planning application for the proposed re-development of the BAE Waterlooville site (hereafter referred to as the BAE site).
- 1.1.2** A Framework Travel Plan (FTP) has also been prepared and submitted by PBA under separate cover and should be read in conjunction with this TAR.
- 1.1.3** PBA has worked closely with the wider BAE Waterlooville project client team which includes Vail Williams and HGP Architects, instructed by BAE to provide planning and masterplanning advice respectively.
- 1.1.4** The Design and Access Statement accompanying the planning submission should be read in conjunction with this TAR.
- 1.1.5** The transport strategy outlined in this TAR has been developed around a balanced and integrated package of measures which seek to enhance movement by alternative modes to the car and to support the sustainable development of the BAE site.

## **1.2 Planning and Development Background**

- 1.2.1** Planning consent was granted at the BAE site in 1982 for 28,300m<sup>2</sup> of light industrial, and research and development uses with ancillary buildings. The consent was implemented generally as approved and remains largely unchanged today.
- 1.2.2** Over recent years a significant proportion of the BAE site has become surplus to operational requirements leaving much of the buildings unoccupied.
- 1.2.3** Accordingly the proposed development will replace the following uses on site:
- Main Building (also referred to as C-block): 19,498sqm of B1b land use which is currently largely unoccupied;
  - Restaurant: 973sqm of ancillary use that is not currently operational but historically catered for employees on site; and
  - Parking areas associated with the above.
- 1.2.4** The following buildings will be retained and are excluded from the BAE development proposals:

- E-Block: 6,726sqm of B1c land use which is currently partially occupied by tenants; and
- Beam Plot: 927sqm of B1c land use which remains in BAE operational use.

**1.2.5** The Vail Williams Planning Statement provides more detail with regard to the planning context of the BAE site in respect of the development proposals (hereafter referred to as the BAE development proposals).

### **1.3 Development Proposals**

**1.3.1** BAE Systems is seeking outline planning permission to redevelop the site with the following mix of uses:

- Buildings for Class B uses in the western part of the site (around 8,500m<sup>2</sup> of floor area).
- A 60-bedroom hotel at the east of the site.
- A restaurant in the south-east of the site.
- A restaurant with drive-through facility in the north-east of the site.
- A car showroom and forecourt to the east of the access from Elettra Avenue from the north.
- Associated access and parking provisions.

**1.3.2** A copy of the BAE development proposals masterplan is enclosed at **Appendix A**.

### **1.4 Scoping of the Transport Assessment**

**1.4.1** This TAR has been prepared in accordance with advice set out within 'Guidance on Transport Assessment' (GTA) (Department for Transport, March 2007) and accordingly it seeks to address the following key issues:

- Reducing the need to travel, especially by car;
- Sustainable accessibility;
- Dealing with residual trips; and
- Mitigation measures.

**1.4.2** GTA advises that a Transport Assessment should help Local Planning Authorities assess the compatibility of a development proposal with relevant planning policy framework, usually the Local Development Framework and relevant transport strategy, usually the Local Transport Plan.

- 1.4.3** It should also allow the transport implications of the proposed development to be properly considered and help identify suitable measures to achieve a more sustainable and environmentally sound outcome.

#### Consultation

- 1.4.4** PBA has consulted with Hampshire County Council (HCC), the local highway authority, from an early stage in the transport assessment process. A scoping meeting was held on 19<sup>th</sup> April 2012 to discuss the outline BAE development proposals and to define the broad scope of this TAR and the accompanying FTP.
- 1.4.5** A copy of the scoping correspondence, including meeting minutes and scoping response from HCC dated 28<sup>th</sup> May 2012 is provided at **Appendix B**.
- 1.4.6** As documented in the scoping meeting minutes, PBA had originally intended to submit specific elements of completed technical works by way of separate Technical Notes for HCC review in advance of submitting this TAR. However, this has not been possible due to the extended time taken to finalise the masterplan and the client team programme for submitting an outline planning application.
- 1.4.7** Whilst it is recognised that submission of information in advance of the planning application would have been advantageous, given the information exchanged pre-scoping, the broad consensus of agreement reached during scoping discussions and the relatively marginal net-impact of the BAE development proposals relative to the baseline, it is anticipated that any queries or issues raised by HCC, following review of this TAR, can be addressed during the post-application determination period

### 1.5 Aims of the Transport Assessment

- 1.5.1** The purpose of the TAR is to demonstrate that:
- The BAE development proposals conform with national and local transport policy;
  - The BAE site is well located in respect of local facilities and amenities and is accessible by pedestrians and cyclists via an extensive network of local pedestrian and cycle routes;
  - The BAE site is accessible by public transport from a range of destinations primarily by local bus services and also through interchange with rail services;
  - Appropriate mitigation measures have been identified to address the residual impacts of the BAE development proposals on the transport network, including measures detailed within the FTP prepared under separate cover; and
  - There are no material transport reasons why the principle of BAE development proposals should not be approved.
- 1.5.2** This TAR presents a comprehensive assessment of the transport implications of the BAE development proposals and outlines a package of measures identified to mitigate the

development impact on the local transport network, with a focus on encouraging sustainable travel choices. The developer will be responsible for securing the implementation of these measures.

## 1.6 Contents of the Transport Assessment

- **Section 2** sets out a review of transport policy relevant to the BAE site;
- **Section 3** provides a description of the BAE site in its strategic and local context with regard to access to existing local facilities and amenities, pedestrian, cycle and public transport facilities. This section also contains a review of local Personal Injury Collision data and a review of committed local development sites;
- **Section 4** provides a description of the BAE development proposals;
- **Section 5** sets out the travel demand in relation to the existing BAE site and the BAE development proposals, and provides detailed analysis of predicted person and vehicle trip generation;
- **Section 6** sets out the transport strategy for the proposed development, considering access and movement to and from the BAE site for pedestrians, cyclists, public transport and vehicular traffic. Vehicular and cycle parking provision is also considered within this section;
- **Section 7** considers the residual transport impacts of the proposed development. Information on committed development traffic, BAE development traffic generation and distribution, the proportional impact and detailed junction capacity assessments are presented;
- **Section 8** considers the mitigation measures proposed as part of this TAR; and
- **Section 9** presents the conclusions of this TAR.

## 2 Policy Review

### 2.1 Introduction

- 2.1.1 Transport policy is detailed within a comprehensive national and local planning and transport policy framework. This section of the TAR provides a review of the planning policy context relevant to transport in the area around the BAE site.

### 2.2 National Policy Guidance

#### National Planning Policy Framework (March 2012)

- 2.2.1 The National Planning Policy Framework (NPPF) is the government's fundamental policy instrument to guide delivery of development and infrastructure.
- 2.2.2 Achieving and delivering sustainable development is at the heart of the NPPF. Underlying this is the motivation to build a strong, competitive economy. In accordance with this, *'planning should operate to encourage and not act as an impediment to sustainable growth'* (para. 9).
- 2.2.3 The NPPF recognises that sustainable transport is key to facilitating sustainable development. It is however recognised that policies and measures to maximise sustainable transport solutions need to be location-specific.
- 2.2.4 A core planning principle of the NPPF is to manage patterns of growth to make 'the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable' (para. 17).
- 2.2.5 Developments should seek to exploit all site-specific opportunities for the use of sustainable modes to reduce the need for major transport infrastructure and to limit the impact of the development on the transport network.
- 2.2.6 Additionally, developments should be located where the need to travel will be minimised and a Travel Plan is required of all developments which generate significant amounts of traffic.

### 2.3 Local Policy Guidance

#### Hampshire Local Transport Plan (2011-2031)

- 2.3.1 The third Hampshire Local Transport Plan (LTP3) sets out the highway authority's detailed policies and proposals for developing an integrated transport strategy from 2011 to 2031. LTP3 comprises of 2 parts, the first is the 20-year strategy and the second is a three-year implementation plan which runs until March 2014.
- 2.3.2 LTP3 is a step towards realising the County's vision of 'safe, efficient and reliable ways to get around a prospering and sustainable Hampshire'.
- 2.3.3 Hampshire has three main transport priorities over the next 20 years:

- To support economic growth by ensuring the safety, soundness and efficiency of the transport network in Hampshire.
- Provide a safe, well-maintained, and more resilient road network in Hampshire.
- Manage traffic to maximise the efficiency of existing network capacity.

**2.3.4** Overlaying these priorities are fourteen policy objectives covering the areas of the economy, traffic management, public transport, quality of life and growth areas.

**2.3.5** To monitor the progress towards meeting the LTP3 priorities and objectives indicators and targets have been set. These cover the areas of management, maintenance and provision of transport infrastructure and sustainable transport. Relevant to the BAE development are the following targets and indicators:

- **Road safety:** To reduce the number of people killed or seriously injured in road traffic accidents on Hampshire's roads by 20% from the 2004 to 2008 average by 2020. To reduce the number of children killed or seriously injured in road traffic accidents on Hampshire's roads by 20% from the 2004 to 2008 average by 2020;
- **Level of congestion at local priority sites:** to address issues within local priority areas with congestion using a programme of practical interventions;
- **Reduce Carbon Emissions;**
- **Increase public transport usage;** and
- **Good local accessibility:** to reduce the need to travel in terms of trip length and frequency.

**2.3.6** Additionally, the area of Waterlooville is covered by the South Hampshire Joint Strategy. The transport vision for South Hampshire is to create:

*"A resilient, cost effective, fully-integrated sub-regional transport network, enabling economic growth whilst protecting and enhancing health, quality of life and environment"*

**2.3.7** In order to deliver this vision, seven key outcomes have been identified each of which have their associated policies:

- Reduced dependence on the private car;
- Improved awareness of the different travel options available;
- Improved journey time reliability;
- Improved road safety;
- Improved accessibility within and beyond South Hampshire;
- Improved air quality and environment and reduced greenhouse gas emissions; and

- Promoting a higher quality of life.

**Shaping our future together, Hampshire Sustainable Community Strategy 2008-2018**

- 2.3.8** This document sets out how HCC and its partners will achieve the vision that 'Hampshire continues to prosper, providing greater opportunity for all without risking the environment'.
- 2.3.9** Regarding traffic growth, it is recognised that increasing road capacity is neither economically feasible nor environmentally desirable as the only means to tackling congestion. It is stressed that plans must be put in place to reduce the need to travel and to use the transport system more intelligently. Additionally, service reliability and availability are stressed as key to encouraging public transport use in the future.
- 2.3.10** Set out as a strategy ambition is the need for infrastructure, including transport infrastructure, to be developed to support economic growth whilst protecting the environment and quality of life.

**Havant Core Strategy (March 2011)**

- 2.3.11** The Core Strategy was adopted in March 2011 and is the principal document in Havant Borough Council's Local Development Framework. The Core Strategy outlines the Council's vision for the spatial development of the borough up to 2026 setting out policies and objectives at a strategic level.
- 2.3.12** The Core Strategy states that improved public transport is an important aspiration for the future of the area of Waterlooville which is separated by the rest of the borough by the A3(M). The Major Development Area (MDA) planned directly to the west of Waterlooville is identified as one of five strategic sites in the borough. The Core Strategy states that the MDA, which runs directly adjacent to the BAE site, must be sustainable and integrated with the existing community and town centre.
- 2.3.13** PBA understands that planning consent for the MDA was granted in March 2011; a comprehensive package of associated transport proposals was identified to integrate the development proposal with the local community and to promote access by sustainable modes.
- 2.3.14** The Vision for Havant Borough in 2026 is for it to be a cleaner, safer and more prosperous place which will be delivered through the Core Strategy policies. One policy in particular is relevant to the transport aspect of the proposals at the BAE site:
- Policy CS20, Transport and Access Strategy, states that a development will be permitted that meets the following criteria:
    - Is consistent with... the 'Reduce, Manage and Invest'<sup>1</sup> strategy.

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<sup>1</sup> The Reduce, Manage and Invest strategy is to deliver efficiency through better use of existing infrastructure; reducing demand by promoting behavioural change and providing additional capacity by extending or providing new infrastructure (Havant Core Strategy, March 2011, para 9.01)

- Does not increase congestion and promotes better use of existing transport networks.
- Improves accessibility to goods, services and employment and promotes equality in the transport system.
- Provides transport management measures to ensure the safe and efficient operation of the strategic and local road network.
- Ensures that highway design responds positively to the characteristics of the area and delivers a high quality public realm for all users.
- Maintains or improves the range of transport modes accessible to the users of the development site with specific emphasis on public transport...and includes walking and cycling where appropriate.
- 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 Summary**

- 2.4.1** It is evident from review of the transport policy context that there is an underlying requirement to deliver sustainable development supported by an integrated transport network prioritising movement by walking, cycling and public transport.
- 2.4.2** This TAR demonstrates that the BAE development proposals will comply with this policy context.

### 3 Existing Conditions

#### 3.1 Introduction

- 3.1.1** This section of the TAR considers the existing transport conditions providing details in respect of site location; access to local facilities and amenities; and the local transport network, including a review of local Personal Injury Collision (PIC) data. Additionally, details in respect of local committed development proposals are also provided.

#### 3.2 Site Location and Access

- 3.2.1** The BAE site is situated within the Brambles Business Park to the west of Waterlooville town centre. Waterlooville is approximately 1 mile west of the A3(M) and 5 miles north of Portsmouth.
- 3.2.2** The A3(M) provides the primary link to the A27 to the south, which in turn connects with the M27. The A27 and M27 provide access along the South Coast to the east and west.
- 3.2.3** Approximately 3 miles to the north of Waterlooville, the A3(M) joins the A3 providing access to the north.
- 3.2.4** The location of the BAE site in its strategic context is illustrated within **Figure 3-1**.
- 3.2.5** Access to the wider Brambles Business Park is provided off the B2150 Hambledon Road via the B2150 Hambledon Road / Milton Road / Elettra Avenue (all moves) roundabout or the Hambledon Road / Silverthorne Way (left-in / left-out) priority junction.
- 3.2.6** The primary means of access to the BAE site is provided off Elettra Avenue via the Elettra Avenue / Waterberry Drive / BAE site access roundabout as illustrated in **Figure 3-2**.
- 3.2.7** Pedestrian and cycle access is provided via a pedestrian and cycle route approximately 2.0m wide along the south west kerb line of the Elettra Avenue / Waterberry Drive / BAE site access roundabout,
- 3.2.8** A secondary pedestrian and cycle access is also provided off Silverthorne Way to the south of the BAE site via a gated access which also serves as an emergency vehicular access. There is no footway provision along the northern kerb line of Silverthorne Way, however an informal crossing point with tactile paving is provided to link up with the footway provided along the southern kerb line of Silverthorne Way.

#### 3.3 Local Facilities and Amenities

- 3.3.1** **Figure 3-3** illustrates the location of local facilities and amenities, demonstrating that there exists a wide range of retail, employment and health opportunities within close proximity of the BAE site.

### **Town Centre**

- 3.3.2** Waterlooville town centre is located within 1km of the BAE site, providing a wide range of facilities and amenities including various retail outlets, ASDA and Waitrose supermarkets, banks, cafes, public houses, post office, dentist and pharmacies.

### **Local Centres**

- 3.3.3** There are two local centres located within close proximity to the BAE site.
- 3.3.4** Hambledon Parade (Local Centre 1), located off the B2150 Hambledon Road within 1km of the BAE site, accommodates a convenience store and post office, an off-licence, restaurant, butchers, beauty salon, swimming shop, public house, take-away outlets and sandwich shop.
- 3.3.5** Milton Parade (Local Centre 2), located off Milton Road within 1.2km of the BAE site, accommodates a food store, pharmacy, florist, beauty salon, public house, and take-away outlets.

### **Retail**

- 3.3.6** Wellington Retail Park is located to the south east of the Brambles Business Park off Maurepas Way and the B2150 Hambledon Road, accommodating a Halfords store, TK Maxx, Argos, Matalan and other major retail brands.

### **Leisure**

- 3.3.7** Horizon Leisure Centre is located in Brambles Business Park off Waterberry Drive, approximately 200m from the BAE site.

### **Health**

- 3.3.8** The Waterlooville Health Centre is located on Dryden Close off Milton Road approximately 1km to the east of the BAE site. Additionally, Forest End Surgery is located on Forest End, off Maurepas Way approximately 1.2km to the south of the BAE site.
- 3.3.9** In addition to dentists within Waterlooville town centre, a further dentist is located off London Road, approximately 1.4km east of the BAE site.

## **3.4 Walking and Cycling**

- 3.4.1** The Brambles Business Park and adjacent local community is served by an extensive network of formal footways with street lighting.
- 3.4.2** Additionally, **Figure 3-3** illustrates the primary pedestrian and cycle routes local to the BAE site as observed by PBA during a site visit on 25<sup>th</sup> May 2012. As illustrated there is an

extensive network of primary walk and cycle routes offering connections to local residential areas and Waterlooville town centre.

- 3.4.3** Existing off-road pedestrian and cycle routes are provided on both sides of Elettra Avenue providing good links into/out of Brambles Business Park and the BAE site.
- 3.4.4** The off-road pedestrian and cycle route adjacent to the southern carriageway of Elettra Avenue continues in a southerly direction adjacent to the southern carriageway of Hambledon Road all the way through to the toucan crossing north of the Maurepas Way/A3 London Road/Rockville Drive roundabout; this crossing provides for access into the town centre.
- 3.4.5** The town centre can also be accessed more directly via the signalised crossing at the B2150 Hambledon Road/Aston Road junction which provides a connection to the off-road pedestrian and cycle route that runs through the Wellington Retail Park connecting to Waterlooville town centre via a subway.
- 3.4.6** The pedestrian and cycle route adjacent to the northern carriageway of Elettra Avenue provides a link to the residential areas accessed off Milton Road via the signalised crossing to the north of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout.
- 3.4.7** Elettra Avenue also provides a connection from the BAE site to the Horizon Leisure Centre located in Brambles Business Park via an informal crossing on Elettra Avenue.
- 3.4.8** The existing network provides extensive pedestrian and cycle infrastructure connecting the BAE site to Waterlooville town centre and surrounding residential areas to the east.
- 3.4.9** On-site observations indicate that pedestrian and cycle routes are typically well signed, although directional signing to the town centre could be improved to help pedestrians and cyclists identify the most direct route.

#### Accessibility Modelling

- 3.4.10** Accessibility modelling to assess the BAE site has been undertaken using GeoConcept for pedestrians and cyclists. As standard the pedestrian walk isochrones and cycle isochrones have been based on walk and cycle speeds of 5km per hour (3mph) and 16km per hour (10mph) respectively. **Figure 3-4** illustrates walk isochrones whilst **Figure 3-5** illustrates cycle isochrones from the BAE site, confirming that:
  - Brambles Business Park including Horizon Leisure Centre and Hambledon Road including the local bus stops (see **Section 3.5**) are within a 5 minute walk or cycle;
  - Wellington Retail Park is within a 10 minute walk or 5 minute cycle;
  - Waterlooville town centre is within a 20 minute walk and 5-10 minute cycle;
  - Both local centres, Waterlooville health centre and Forest End Surgery are within a 10-20 minute walk and a 5-10 minute cycle;

- Much of the residential area of Waterlooville is within a 30 minute walk and 10 minute cycle;
- The wider area, including Waterlooville, Horndean, Denmead and Purbrook, are accessible within a 20 minute cycle; and
- Havant, Bedhampton and Cosham train stations are all within a 30 minute cycle.

#### National Travel Statistics 2010

- 3.4.11** The National Travel Survey 2010 (Table NTS0306) identifies that the average trip length by walking is 0.7 miles (1.1km) and by bicycle is 2.8 miles (4.5km). Adopting the same walk and cycle speeds considered above, this equates to a 13 minute walk time and 10 minute cycle time.
- 3.4.12** These statistics suggest that in view of the general accessibility of the site future development related trips to the majority of the local facilities and services could reasonably be expected to be undertaken on foot or by cycle, except where car use is an obvious prerequisite or indeed the reason for the trip.

### 3.5 Public Transport

- 3.5.1** **Figure 3-6** illustrates the existing network of bus routes local to the BAE site. Local bus services operate close to the BAE site along Hambledon Road and also serve the Brambles Business Park directly via Waterberry Drive.

- 3.5.2** The following services currently operate close to the BAE site as shown in **Table 3.1**:

Table 3.1: Existing Bus Services

| Service/<br>Operator       | Route                                                                                                          | Frequency                   |                             |
|----------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
|                            |                                                                                                                | Mon – Sat                   | Eve & Sun                   |
| 39<br>Stagecoach           | Wecock Farm – Waterlooville – Crookhorn – Asda – Havant                                                        | 15 mins                     | No service eve; 60 mins Sun |
| 40<br>First                | Wecock Farm – Waterlooville – Crookhorn – Cosham – Hilsea – Portsmouth – Southsea                              | 15 mins                     | 60 mins eve; 20 mins Sun    |
| 45/45A<br>First            | Hambledon (45) – Denmead – Waterberry Drive (45A) – Waterlooville – QA Hospital – Cosham – Hilsea – Portsmouth | 60 mins (45)/ 60 mins (45A) | No service                  |
| 300<br>Emsworth & District | Denmead – Waterlooville – Wecock Farm – Horndean – Rowlands Castle – Emsworth – Southbourne – Chichester       | 1 journey Wed               | No service                  |
| X40<br>First               | Wecock Farm – Waterlooville – Portsmouth – Southsea via A3(M)                                                  | 2 inbound journeys AM peak  | No service                  |

- 3.5.3** All of the above bus services currently serve stops close to the B2150 Hambledon Road/Milton Road roundabout. There are three stops in the immediate vicinity of the BAE site:
- B2150 Hambledon Road (southbound) approximately 320m from the BAE site to the south of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout served by all of the local services;
  - B2150 Hambledon Road (northbound) approximately 340m from the BAE site to the north of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout served by services 45/45A and 300; and
  - Milton Road (north-eastbound) approximately 400m from the BAE site, north-eastbound to the east of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout served by services 39, 40, 300 and X40.
- 3.5.4** Bus lay-bys and bus shelters are provided at both the B2150 Hambledon Road bus stops, the southbound bus stop provides service information and timetables, at the time of our site visit no service information was provided at the northbound bus stop.
- 3.5.5** A bus flag with service information and timetable was provided at the Milton Road stop.
- 3.5.6** Service 45A additionally serves stops within Brambles Business Park, around the Waterberry Drive loop.
- 3.5.7** The BAE site is well connected to major local destinations with 10 buses per hour to Waterlooville town centre, 4 per hour to Portsmouth and Southsea and 4 per hour to Havant. Residential areas in the immediate vicinity also have a good level of service to the BAE site.
- 3.5.8** Additional bus services operate to Waterlooville Precinct, approximately 1km from the BAE site. These include First's 'Zip' branded route 41 which provides a 15 minute frequency 'rapid transit' style service between Clanfield, Waterlooville and Portsmouth, and Stagecoach service 37 which provides an hourly link to Havant and Petersfield (and two hourly on to Alton). There is also a half hourly frequency fast X42 service between Waterlooville and Portsmouth on Mondays to Fridays.
- 3.5.9** Therefore at present, the BAE site has excellent bus connections to Waterlooville town centre, Havant, Portsmouth, Southsea, Denmead, and wider residential areas in the south-east Hampshire area.
- 3.5.10** There are three railway stations locally accessible to Waterlooville although not located in Waterlooville itself. These are Bedhampton, Havant and Cosham which are located approximately 4.6km, 5.3km and 5.1km from the BAE site respectively. Trains serving these stations provide direct links to destinations including Portsmouth, Chichester, Littlehampton, Worthing, Hove and Brighton.
- 3.5.11** Cosham train station is accessible via bus service 40 which operates close to the BAE site.

### Accessibility Modelling

- 3.5.12** Accessibility modelling has been undertaken to assess the accessibility of the BAE site by local bus services. Accession software has been used to generate bus isochrones based on the following criteria:
- 400m access to bus stops from the BAE site.
  - 50m interchange distance allowed when changing services.
  - A walk distance factor of 1.2 has been adopted to compensate for the fact that it is not generally possible to walk in an 'as-the-crow-flies' line to a bus stop.
  - The isochrones represent travel time and accessibility between 07:00 and 09:00 on a Monday, to represent normal peak hour accessibility.
- 3.5.13** **Figure 3-7** illustrates bus isochrones from the BAE site, demonstrating that Waterlooville town centre is accessible within a 10 minute bus journey. Purbrook to the south, and Denmead and Horndean to the north are accessible within a 20 minutes bus journey.
- 3.5.14** Looking across a wider area, the northern part of Portsmouth is accessible within 40 minutes with the majority of Portsmouth and parts of Hayling Island and Fareham accessible within a 50-60 minute bus journey.
- 3.5.15** This analysis confirms that a large area serving a number of key local destinations is accessible within a 60 minute bus journey of the BAE site.

## 3.6 Local Highway Network

- 3.6.1** The BAE site is located to the west of Waterlooville and accessed via the Elettra Avenue / Waterberry Drive / BAE site access roundabout to the north of the BAE site. This roundabout provides connection to the B2150 Hambledon Road via the roundabout with Elettra Avenue / Milton Road located approximately 100m to the east.
- 3.6.2** Elettra Avenue, between the Elettra Avenue / Waterberry Drive / BAE site access roundabout and B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout, is a 10m wide carriageway with three lanes. In both the eastbound and westbound direction, a single exit lane is provided from each roundabout which flares to two lanes on the approach to the next roundabout.
- 3.6.3** Elettra Avenue continues west of roundabout with Waterberry Drive / BAE site access as a single carriageway approximately 7m wide. Elettra Avenue is subject to a 30mph speed limit.
- 3.6.4** The B2150 Hambledon Road runs adjacent to the eastern boundary of the BAE site and provides a key strategic link via connections with the A3(M), to the east of Waterlooville, which provides further connections to the A27 and M27.

- 3.6.5** The B2150 Hambledon Road to the north of the roundabout with Elettra Avenue / Milton Road is a single carriageway approximately 7.3m in width and subject to a 30mph speed limit.
- 3.6.6** The B2150 Hambledon Road to the south of the roundabout with Milton Road / Elettra Avenue is a dual carriageway of approximately 7.3m width in each direction and subject to a 40mph speed limit.
- 3.6.7** Manual traffic surveys were undertaken at two local junctions: Elettra Avenue / Waterberry Drive / BAE site access roundabout and the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout. The surveys were undertaken by Community Systems Ltd (CSL) on behalf of PBA on Thursday 26<sup>th</sup> April 2012 between the hours of 0700-1000 and 1600-1900. Further details of the surveys are contained in **Section 7**.
- 3.6.8** Vehicle speeds were recorded by an ATC survey (also undertaken by CSL on April 26<sup>th</sup> 2012) on B2150 Hambledon Road to the south of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout. The 85th percentile northbound speed was recorded as 39.1 mph and southbound as 39.0mph.

### **3.7 Personal Injury Collision Data (PIC)**

- 3.7.1** PIC data was obtained from the Hampshire Constabulary and analysis has been undertaken for the most recent three year period (2009/10 – 2011/12). A copy of the raw data is provided within **Appendix C**.
- 3.7.2** **Figure 3-8** illustrates the study area assessed, the location of each accident and its severity. The Figure should be viewed in conjunction with the full PIC report (provided in **Appendix C**), which sets out each collision in detail.
- 3.7.3** Over the three year period, there were a total of 56 collisions within the study area. Of these, 40 were listed as 'slight' in severity and 10 as 'severe'. There were no fatalities.
- 3.7.4** Of the 56 collisions, a total of 13 collisions involved vulnerable road users; for this review vulnerable users have been classed as pedestrians and cyclists. Nine collisions were listed as 'slight' in severity and 4 as "serious".
- 3.7.5** Our detailed review has focused on the following locations along the B2150 Hambledon Road Corridor that runs adjacent to the BAE site boundary:

- B2150 Hambledon Road / Hambledon Parade Junction;
- B2150 Hambledon Road / Milton Road / Elettra Avenue Roundabout Junction;
- Elettra Avenue / Waterberry Drive / BAE site access Roundabout Junction;
- B2150 Hambledon Road / Ashton Road Junction; and
- B2150 Hambledon Road / Maurepas Way Roundabout Junction.

#### **B2150 Hambledon Road / Hambledon Parade Junction**

- 3.7.6** 5 collisions were recorded at this location; all collisions were listed as "slight" in severity, with 1 collision involving a vulnerable road user (cyclist). The vulnerable road user collision occurred as the cyclist rode into the back of an unattended parked car.
- 3.7.7** Of the remaining 4 collisions, one occurred as the driver failed to look and cut across a motorbike as they turned into Hambledon Parade; one occurred when a vehicle, waiting to turn out of Hambledon Parade alongside a van, failed to see a vehicle on the main carriageway with which it collided. The remaining 2 collisions were due to rear shunts.

#### **B2150 Hambledon Road / Milton Road / Elettra Avenue Roundabout Junction**

- 3.7.8** Eight collisions were recorded at this location: all collisions were listed as 'slight' in severity, with 1 collision involving a vulnerable road user (cyclist). The vulnerable road user collision occurred as car driver entered the roundabout from the north and collided with the cyclist on the roundabout. The cause of collision was recorded as the driver's failure to look properly.
- 3.7.9** Of the remaining 7 collisions at the roundabout, the cause of 6 were listed as the drivers' failure to look properly; 3 collisions occurred as drivers failed to see traffic queuing and 3 occurred due to drivers failing to give-way to vehicles on the roundabout. The remaining accident occurred on a bus when a chair dislodged under braking and hit a passenger.

#### **Elettra Avenue / Waterberry Drive / BAE site access Roundabout Junction**

- 3.7.10** One collision was recorded at this location which occurred when a van approaching Elettra Avenue from Waterberry Avenue collided with the back of a car; the cause of collision was recorded as careless/reckless driving.

#### **B2150 Hambledon Road / Aston Road Junction**

- 3.7.11** Three collisions were recorded at this location, none of which involved a vulnerable road user. However 1 collision was 'serious' which occurred when a motorbike disobeyed a red signal and collided with a van turning right into Aston Road.

- 3.7.12** Of the remaining 2 collisions at the roundabout, one was also due to the disobeying of a red signal and the other when the driver's foot slipped off the brake and hit a stationary vehicle in front.

#### **B2150 Hambledon Road / Maurepas Way Roundabout Junction**

- 3.7.13** Six collisions were recorded at this location, of these 3 were recorded as "serious" with 2 involving cyclists. One collision involving a cyclist occurred when a car tried to overtake a cyclist on the roundabout and struck the cyclist; the other occurred as a car entered the roundabout and failed to look properly and struck the cyclist on the roundabout. The other serious accident occurred when an inexperienced motorcyclist lost control and struck a kerb.
- 3.7.14** The 3 remaining slight collisions occurred when a car driver failed to look properly and struck a motorbike on the roundabout; a taxi driver braked hard causing his passenger to hit his head; and due to a rear shunt.

#### **PIC Data Summary**

- 3.7.15** Analysis of PIC data over a three year period identified a total of 56 collisions within the study area. Of these, 40 were listed as 'slight' in severity and 10 as 'severe'. There were no fatalities.
- 3.7.16** Analysis of PIC data for the Elettra Avenue / Waterberry Drive / BAE site access roundabout detailed above confirms that there is no historical record of safety issues.
- 3.7.17** Across the wider area, analysis of PIC data indicates that collisions with vulnerable road users show 'human error' to be the cause – i.e. failing to look properly, misjudging speed/distance, being distracted, or ignoring road markings/traffic signals.
- 3.7.18** The B2150 Hambledon Road/Aston Road signalised junction will be improved as part of the committed development proposals (as considered further in **Section 3.8**) within the local area which it is anticipated will help reduce historical accidents at this junction.
- 3.7.19** In summary there does not appear to be any local safety concerns or inherent highway design problems that would preclude of the BAE development proposals.

### **3.8 Committed Development**

- 3.8.1** As agreed with HCC during scoping discussions, there are three committed developments that specifically warrant consideration as part of this TAR, these developments are:
- Sainsbury's, Hambledon Road; and
  - West of Waterlooville MDA which comprises of:
    - Taylor Wimpey 'Wellington Park', and
    - Newlands Common.

**3.8.2** Figure 3-9 illustrates the location of these sites which are considered in more detail below.

**Sainsbury's Hambledon Road**

- Application no.: APP/10/00793
- Application Received: 22nd October 2010
- Application Approved: 22nd December 2011

**3.8.3** The Sainsbury's development is located off Hambledon Road, and will involve the redevelopment of former industrial land.

**3.8.4** The Sainsbury's development will consist of a food retail building with a Gross Floor Area (GFA) of 7,745sqm, a 6 pump petrol filling station with associated kiosk facilities and 438 car parking spaces.

**3.8.5** The BAE site will be accessed via the B2150 Hambledon Road/Aston Road signalised junction.

**West of Waterlooville Major Development Area (MDA)**

**3.8.6** The Havant & Winchester Local Plans required a development of 'mixed use new community comprising at least 2000 dwellings, 30 hectares of employment land and associated physical and social infrastructure'.

**3.8.7** Two planning permissions have been granted for the MDA site:

- Taylor Wimpey 'Wellington Park', and
- Newlands Common.

**Taylor Wimpey**

- Application no.: 05/40000/000
- Application Received: 7th March 2005
- Application Revised: 24th April 2006
- Application Approved: 4th January 2008

**3.8.8** The Taylor Wimpey development is located within the northern area of the MDA site, north of Brambles Business Park. The site is also referred to as Old Park Farm.

**3.8.9** The Taylor Wimpey Transport Assessment Report, November 2004, states that the development is for 474 residential dwellings, 7.7 ha of employment and 2.8 ha of mixed use land. However the Transport Assessment Addendum Report, March 2006, states the

development is for 474 residential dwellings, 7.10 ha of employment and 2.46 ha of mixed use land.

- 3.8.10** The Taylor Wimpey site is currently under construction with a number of units occupied, access is provided directly off the B2150 Hambledon Road.

#### **Newlands Common**

- Application no.: APP/10/00828
- Application Received: November 2010
- Application Approved: March 2011

- 3.8.11** The Newlands Common development is located within the remainder of the MDA site (Plant Farm), to the west and south of Brambles Business Park.

- 3.8.12** The Newlands development is for around 2650 residential dwellings, 19.25ha of employment land a local community centre, healthcare and elderly care facilities, two primary schools and a nursery.

- 3.8.13** The primary access is provided directly off the B2150 Hambledon Road/A3 Maurepas Way Roundabout and the site is currently under construction. The proposed internal road network provides a link to the proposed Taylor Wimpey site.

#### **Committed Development Transport Proposals**

- 3.8.14** A review of available information for the committed development sites has been undertaken. Transport Assessment Reports and Travel Plans, where prepared, were sourced for each development, although copies of the Section 106/278 documents were not readily available and therefore the final transport proposals could not be confirmed.

- 3.8.15** From review of the available documents the key transport proposals of relevance to the BAE site include;

- Improvements to the B2150 Hambledon Road / Aston Road signalised junction;
- New surface crossing of Maurepas Way and pedestrian ramp to provide a Disability Discrimination Act compliant pedestrian link to the town centre at the location of the existing subway to the south of Wellington Retail Park;
- Possible pedestrian and cycle link on Maurepas Way approximately 100m south of the B2150 Hambledon Road / A3 Maurepas Way roundabout;
- New bus service X39 which would divert via Newlands between Waterlooville and Crookhorn; and

- Improvements to the existing bus services 39 and X42; the frequency of the 39/X39 combined will be every 10 minutes Monday to Saturday and every 30 minutes evenings and Sunday. The X42 will be diverted via Newlands between Waterloooville and Widley.

**3.8.16** Traffic flows resulting from these committed developments are considered further within **Section 7.5** of this report.

### **3.9 Summary**

**3.9.1** The BAE site is located within close proximity to an extensive range of local facilities and amenities; linked to the BAE site via an established network of existing pedestrian and cycle routes and local bus services.

**3.9.2** Accessibility modelling has shown the BAE site to be accessible by pedestrians, cyclists and also bus users at a local and more strategic level. Local bus stops are located within a 5 minute walk of the BAE site and the town centre can be accessed within a 5 minute cycle or a 10-20 minute walk.

**3.9.3** Against this background, the BAE site is well positioned in terms of access by sustainable modes.

**3.9.4** The BAE site is also located close to the key local and strategic road network, providing good connections within Waterloooville and the wider area.

**3.9.5** A review of PIC data demonstrated that there is no record of local safety concerns or inherent highway design issues that would affect highway safety in the vicinity of the BAE site.

**3.9.6** Local committed development sites have been considered. It is anticipated that the transport measures proposed by these proposals will further enhance sustainable transport opportunities across the local area.

## 4 Development Proposals

**4.1.1** BAE Systems is seeking outline planning permission to redevelop the site with the following mix of uses:

- Buildings for Class B uses in the western part of the site (around 8,500m<sup>2</sup> of floor area).
- A 60-bedroom hotel at the east of the site.
- A restaurant in the south-east of the site.
- A restaurant with drive-through facility in the north-east of the site.
- A car showroom and forecourt to the east of the access from Elettra Avenue from the north.
- Associated access and parking provisions.

**4.1.2** The land uses outlined above will be provided in addition to the retained land uses:

- E-Block: 6,726sqm of B1c land use; and
- Beam Plot: 927sqm of B1c land use.

**4.1.3** Vehicle and cycle parking for the development will be provided in accordance with HCC 'Hampshire Parking Strategy and Standards, Spring 2002'.

**4.1.4** Parking numbers will be provided between the 'maximum parking limit' and 'reduced parking in areas of high accessibility' threshold.

**4.1.5** A copy of the BAE development proposals masterplan is enclosed at **Appendix A**; the masterplan illustrates the location and extent of vehicular parking, cycle parking and service areas for each unit. For further details, refer to the Design and Access Statement prepared and submitted under separate cover.

## 5 Travel Demand

### 5.1 Introduction

- 5.1.1** This section of the TAR provides an assessment of the baseline and proposed development vehicular and person trip generation; superseding information previously presented to HCC during scoping discussions (see [Appendix B](#)).
- 5.1.2** As agreed with HCC during scoping discussions, the travel demand resulting from the BAE development proposals should be considered relative to the baseline travel demand resulting from the existing planning consent.
- 5.1.3** This section of the TAR defines the baseline vehicular trip generation; confirms the predicted development vehicular trip generation for two alternative development scenarios; and confirms the predicted person trip generation arising from both development scenarios.

### 5.2 Baseline Overview

- 5.2.1** The baseline land uses at the BAE site are summarised as follows:
- Main Building (also referred to as C-block): 19,498sqm of B1b land use ;
  - E-Block: 6,726sqm of B1c land use;
  - Beam Plot: 927sqm of B1c land use; and
  - Restaurant: 973sqm ancillary use that historically catered for employees on site.
- 5.2.2** The existing BAE site is significantly under occupied and there is no data available from when the site was fully operational; accordingly it has not been possible to define the baseline AM and PM peak hour vehicular generation through historical or new surveys.
- 5.2.3** As agreed during scoping discussions with HCC, the TRICS database has been extensively reviewed to identify appropriate donor trip rates which can then be applied to the BAE site land uses to define the baseline.
- 5.2.4** The Main Building is an office block; the TRICS database has been reviewed to identify an appropriate donor B1b trip rate.
- 5.2.5** The E-Block is an industrial style unit; the TRICS database has been reviewed to identify an appropriate donor B1c trip rate.
- 5.2.6** The Beam Plot is an industrial style unit accommodating a unique operational activity. A comparable 'donor' site is not available in the TRICS database, neither is there a comparable BAE site from which to source information. Given the small scale of the Beam Plot relative to the wider BAE site land uses and to ensure a consistent approach is adopted

for all of the B1c land uses, the baseline B1c trip rate determined for the E-Block will also be applied to the Beam Plot.

**5.2.7** The Restaurant is an ancillary use catering for the site based employees and is not considered to have generated additional trips.

**5.2.8** In summary, the baseline will be determined by applying appropriate donor trip rates to the following existing land use schedule:

- B1b land use (the Main building): 19,498sqm; and
- B1c land use (E-Block and Beam Plot): 7,653sqm.

### 5.3 Baseline Vehicle Trip Generation

**5.3.1** A comprehensive review of the TRICS database has been undertaken to determine B1b and B1c land use trip generation rates from comparable donor sites; detailed analysis is provided within PBA Technical Note 003 Rev A attached at [Appendix D](#).

**5.3.2** **Table 5.1** details the donor trip rates identified for the existing consented BAE site B1b and B1c land uses and **Table 5.2** sets out the resulting baseline equivalent site vehicular trip generation.

Table 5.1: B1b and B1c Donor Trip Rates

| Land use | AM Peak  |            |         | PM Peak  |            |         |
|----------|----------|------------|---------|----------|------------|---------|
|          | Arrivals | Departures | Two-way | Arrivals | Departures | Two-way |
| B1b      | 1.191    | 0.078      | 1.269   | 0.086    | 0.914      | 1.0     |
| B1c      | 1.3      | 0.35       | 1.65    | 0.2      | 0.983      | 1.183   |

Table 5.2: BAE Site Baseline Vehicular Trip Generation

|               | AM Peak    |            |            | PM Peak   |            |            |
|---------------|------------|------------|------------|-----------|------------|------------|
|               | Arrivals   | Departures | Two-way    | Arrivals  | Departures | Two-way    |
| Main Building | 232        | 15         | 247        | 17        | 178        | 195        |
| E Block       | 87         | 24         | 111        | 13        | 66         | 80         |
| Beam Plot     | 12         | 3          | 15         | 2         | 9          | 11         |
| <b>Total</b>  | <b>332</b> | <b>42</b>  | <b>374</b> | <b>32</b> | <b>253</b> | <b>286</b> |

**5.3.3** As agreed during scoping discussions with HCC, the baseline should represent the total trip generation predicted to arise from the existing consented uses based on full occupation of the site; accordingly the vehicular trip generation detailed in **Table 5.2** defines the BAE site traffic baseline. It is against this traffic baseline that the BAE development proposals should be assessed.

**5.3.4** For comparative purposes only, the AM and PM peak hour trips currently generated by the existing activities at the (significantly under occupied) BAE site, as recorded by manual traffic count surveys on 19<sup>th</sup> April 2012, are summarised in **Table 5.3**.

Table 5.3: Existing BAE Site Vehicular Trip Generation

| Time Period         | Arrivals | Departures | Two-way |
|---------------------|----------|------------|---------|
| AM Peak (0800-0900) | 45       | 2          | 47      |
| PM Peak (1645-1745) | 1        | 41         | 42      |

- 5.3.5** Table 5.3 indicates that observed traffic generation (two-way) associated with the current under-utilised site is approximately 13% and 15% of the BAE site baseline traffic in the AM and PM peaks respectively.

## 5.4 Development Vehicle Trip Generation

- 5.4.1** The development proposal consists of the following:

- Proposed Land Uses:
  - Multiple buildings delivering 9,085sqm of Class B uses;
  - A 60-bedroom hotel;
  - A 685sqm restaurant in the south-east of the site;
  - A 300sqm restaurant with drive-through facility in the north-east of the development; and
  - A 1,020sqm car showroom and forecourt to the east of the access from Elettra Avenue from the north.

- 5.4.2** As a point of clarification, the BAE development proposal floor areas detailed above are provided as Gross Floor Area; floor areas presented on the masterplan and referred to previously in this TAR are provided as Gross Internal Area.

- 5.4.3** In addition, the following existing uses on site will be retained:

- Retained Existing Land Uses:
  - E-Block: 6,726sqm of B1c land use; and
  - Beam Plot: 927sqm of B1c land use.

- 5.4.4** The TRICS database has been reviewed to determine peak hour vehicular trip rates for each land use. The B1b and B1c rates identified to define the baseline have been adopted for the proposed B1b and B1c uses; additional TRICS analysis has been undertaken to determine trip rates for all other land uses, a copy of the additional TRICS outputs are provided within **Appendix E**.

**5.4.5** Table 5.4 summarises the proposed development vehicular trip rates;

Table 5.4: Proposed Development Vehicular Trip Rates

| Land use            | AM Peak  |            |         | PM Peak  |            |         |
|---------------------|----------|------------|---------|----------|------------|---------|
|                     | Arrivals | Departures | Two-way | Arrivals | Departures | Two-way |
| B1c                 | 1.30     | 0.35       | 1.65    | 0.20     | 0.98       | 1.18    |
| B2                  | 0.86     | 0.33       | 1.19    | 0.25     | 0.76       | 1.01    |
| B8                  | 0.31     | 0.15       | 0.47    | 0.18     | 0.24       | 0.42    |
| Car showroom        | 2.18     | 0.89       | 3.06    | 0.64     | 1.71       | 2.35    |
| Hotel               | 0.10     | 0.23       | 0.32    | 0.21     | 0.08       | 0.28    |
| Restaurant          | 0.00     | 0.00       | 0.00    | 3.45     | 2.27       | 5.72    |
| Drive-in restaurant | 5.94     | 4.41       | 10.35   | 10.78    | 10.49      | 21.27   |

**5.4.6** At this stage in the planning and development process there remains uncertainty as to what mix of B-class uses will ultimately be delivered on site; the planning application seeks a degree of flexibility rather than prescribing a defined floor area to each B-class use.

**5.4.7** Against this background and to address this uncertainty, two development scenarios have been identified for assessment purposes.

- Scenario 1: assumes a mix of B-class uses:
  - Buildings A: 1,005sqm of B1c land use;
  - Buildings B – C: 4,225sqm of B2 land use; and
  - Buildings D – E: 3,855 sqm of B8 land use.
- Scenario 2: assumes total B-class uses (9,085sqm) are B1c.

**5.4.8** The non B-class uses remain the same for both scenarios.

**5.4.9** The resulting development vehicular trip generation predicted to arise from each development scenario is detailed in **Tables 5.5** and **5.6**.

Table 5.5: Scenario 1, Proposed Development Vehicular Trip Generation

| Land use            | AM Peak    |            |            | PM Peak   |            |            |
|---------------------|------------|------------|------------|-----------|------------|------------|
|                     | Arrivals   | Departures | Two-way    | Arrivals  | Departures | Two-way    |
| Building A (B1c)    | 13         | 4          | 17         | 2         | 10         | 12         |
| Building B-C (B2)   | 36         | 14         | 50         | 11        | 32         | 43         |
| Building D-E (B8)   | 12         | 6          | 18         | 7         | 9          | 16         |
| Car showroom        | 22         | 9          | 31         | 7         | 17         | 24         |
| Hotel               | 6          | 14         | 19         | 12        | 5          | 17         |
| Restaurant          | 0          | 0          | 0          | 24        | 16         | 39         |
| Drive-in restaurant | 18         | 13         | 31         | 32        | 31         | 64         |
| <b>Total</b>        | <b>107</b> | <b>59</b>  | <b>167</b> | <b>94</b> | <b>120</b> | <b>215</b> |

Table 5.6: Scenario 2, Proposed Development Vehicular Trip Generation

| Land use            | AM Peak    |            |            | PM Peak   |            |            |
|---------------------|------------|------------|------------|-----------|------------|------------|
|                     | Arrivals   | Departures | Two-way    | Arrivals  | Departures | Two-way    |
| Buildings A-E (B1c) | 118        | 32         | 150        | 18        | 89         | 107        |
| Car showroom        | 22         | 9          | 31         | 7         | 17         | 24         |
| Hotel               | 6          | 14         | 19         | 12        | 5          | 17         |
| Restaurant          | 0          | 0          | 0          | 24        | 16         | 39         |
| Drive-in restaurant | 18         | 13         | 31         | 32        | 31         | 64         |
| <b>Total</b>        | <b>164</b> | <b>68</b>  | <b>232</b> | <b>93</b> | <b>158</b> | <b>251</b> |

**5.4.10** From review of the data presented in **Tables 5.5** and **5.6**, scenario 2 is predicted to generate more trips than scenario 1 in both the AM and the PM peak hours.

**5.4.11** **Table 5.7** provides a comparison of the site vehicular trip generation baseline with the trip generation predicted to arise from each development scenario. Note that both the baseline and development scenarios 1 and 2 include trips associated with the retained uses (E-block and Beam Plot).

Table 5.7: Net Impact of Proposed Development Vehicular Trip Generation (relative to the baseline)

|            | AM 0800-0900 |            |       |                              | PM 1700-1800 |            |       |                              |
|------------|--------------|------------|-------|------------------------------|--------------|------------|-------|------------------------------|
|            | Arrivals     | Departures | 2-way | 2-way Net impact on Baseline | Arrivals     | Departures | 2-way | 2-way Net impact on Baseline |
| Baseline   | 332          | 42         | 374   |                              | 32           | 253        | 286   |                              |
| Scenario 1 | 207          | 86         | 293   | -81                          | 110          | 196        | 305   | 20                           |
| Scenario 2 | 263          | 94         | 358   | -16                          | 108          | 234        | 342   | 56                           |

**5.4.12** From review of the data presented in **Table 5.7**, the following observations can be made:

- Both development scenarios are predicted to generate less trips in the AM peak hour than the site baseline;
- Both development scenarios are predicted to generate more trips in the PM peak hour than the site baseline;
- Over the combined AM and PM peak hours, scenario 1 is predicted to generate approximately 60 less trips than the site baseline; and
- Over the combined AM and PM peak hours, scenario 2 is predicted to generation approximately 40 more trips than the site baseline.

**5.4.13** From review of the information presented above, it is apparent that the BAE development proposals are predicted to have a marginal impact in terms of peak hour vehicular trip generation relative to the site baseline.

## 5.5 Development Person Trip Generation

**5.5.1** The peak hour person trips associated with the BAE development proposals has been determined through analysis of the TRICS database. Where TRICS data was not available

the 2001 Census journey to work modal split data for the two output areas covering the BAE Waterlooville site (24UHGE0004 and 24UHGE0031) has been adopted. The 2001 Census source data is attached at [Appendix F](#).

**5.5.2** The multi-modal person trip generation has been determined by factoring the modal split (sourced from TRICS or the 2001 Census) to the vehicular trip generation defined in [Section 5.4](#) of this TAR.

**5.5.3** The methodology adopted for each land use class is summarised below, with the resulting person trip generation for each development scenario detailed in [Tables 5.8](#) and [5.9](#).

- B1c: adopted the TRICS multi-modal data for the donor site used to generate the vehicular trip generation (TRICS reference BR-02-D-03);
- B2: adopted TRICS 'industrial unit' multi-modal data that most closely matched the B2 proposals (scenario 1 only); source data attached at [Appendix E](#);
- B8: limited TRICS multi-modal data available that matched the B8 proposals (scenario 1 only); therefore 2001 Census journey to work modal split data adopted;
- Hotel: adopted TRICS multi-modal data that most closely matched the proposals; source data attached at [Appendix E](#);
- Car Showroom: limited TRICS multi-modal data available that matched the proposals; therefore 2001 Census journey to work modal split data adopted;
- Restaurant: adopted TRICS multi-modal data that most closely matched the proposals; source data attached at [Appendix E](#);
- Drive-through restaurant: adopted TRICS multi-modal data that most closely matched the proposals; source data attached at [Appendix E](#). Note: the multi-modal data in TRICS confirmed no AM peak period trip rates, however the vehicular trip rates accounted for some AM trips, therefore the PM modal split was adopted and applied to both the AM and PM peak periods.

Table 5.8: Scenario 1, Person Trip Generation

|                   | AM Peak    |            |            | PM Peak    |            |            |
|-------------------|------------|------------|------------|------------|------------|------------|
|                   | Arrivals   | Departures | Two-way    | Arrivals   | Departures | Two-way    |
| Vehicle           | 207        | 86         | 293        | 110        | 196        | 305        |
| Vehicle Passenger | 22         | 15         | 36         | 52         | 48         | 101        |
| Public Transport  | 8          | 4          | 12         | 4          | 6          | 10         |
| Cycle             | 7          | 3          | 10         | 2          | 5          | 7          |
| Walk              | 20         | 13         | 32         | 15         | 16         | 31         |
| <b>Total</b>      | <b>263</b> | <b>120</b> | <b>383</b> | <b>183</b> | <b>271</b> | <b>454</b> |

Table 5.9: Scenario 2, Person Trip Generation

|                   | AM Peak    |            |            | PM Peak    |            |            |
|-------------------|------------|------------|------------|------------|------------|------------|
|                   | Arrivals   | Departures | Two-way    | Arrivals   | Departures | Two-way    |
| Vehicle           | 263        | 94         | 358        | 108        | 234        | 342        |
| Vehicle Passenger | 15         | 12         | 27         | 51         | 46         | 96         |
| Public Transport  | 11         | 4          | 15         | 4          | 5          | 9          |
| Cycle             | 9          | 3          | 11         | 1          | 4          | 5          |
| Walk              | 26         | 14         | 40         | 14         | 16         | 30         |
| <b>Total</b>      | <b>324</b> | <b>128</b> | <b>452</b> | <b>178</b> | <b>304</b> | <b>483</b> |

## 5.6 Summary

**5.6.1** This section of the TAR has set out details in respect of the BAE site baseline and proposed development vehicular and person trip generation, confirming that the BAE development proposals are predicted:

- To have a marginal impact in terms of peak hour vehicular trip generation relative to the site traffic baseline; and
- To generate up to 452 person trips in the AM peak hour and 483 person trips in the PM peak hour.

**5.6.2** The vehicular and person trip generation detailed within this section of the TAR have informed the strategy and assessment works presented in the following sections, including the identification of site specific mitigation measures.

## 6 Transport Strategy

### 6.1 Introduction

**6.1.1** This section of the TAR sets out the transport strategy for the BAE development proposals, based upon the findings presented in previous sections including the following:

- Review of the national and local transport policy context has confirmed an underlying requirement to deliver sustainable development supported by an integrated transport network prioritising movement by walking, cycling and public transport;
- The BAE site is located within close proximity to an extensive range of local facilities and amenities; linked to the site via an established network of existing pedestrian and cycle routes and local bus services;
- Accessibility modelling has shown the existing site to be accessible by pedestrians, cyclists and also bus users at a local and more strategic level. Local bus stops are located within a 5 minute walk of the site and the town centre can be accessed within a 5 minute cycle or a 10-20 minute walk;
- Review of PIC data has not identified any specific issues in respect of providing safe access to the site for users of all modes;
- It has been identified that other committed development proposals are expected to deliver localised improvements to the transport network that would also benefit future employees and visitors to the redeveloped BAE site; and
- The vehicular and person trip generation of the proposed development is predicted to be broadly comparable to the site baseline.

**6.1.2** The proposed transport strategy set out below has been prepared against this background.

**6.1.3** Further details in relation to access, movement, parking and servicing are also provided within the Design and Access Statement supporting the planning application and submitted under separate cover.

### 6.2 Pedestrian and Cycle Access

**6.2.1** The main point of access for pedestrians and cyclists will be maintained from the Elettra Avenue / Waterberry Drive / BAE site access roundabout through the continuation of the existing route into the site. This is shown on the development proposals masterplan at **Appendix A**.

**6.2.2** A pedestrian and cycle access is proposed onto Silverthorne Way approximately 40m west of the existing emergency site access.

- 6.2.3** Footways will be provided as part of the masterplan layout and dedicated areas have been identified to accommodate safe and secure cycle parking in accordance with HCC's 'Hampshire Parking Strategy and Standards, Spring 2002'.
- 6.2.4** In addition to the on-site proposals considered above, a number of off-site local pedestrian and cycle measures that would further enhance the accessibility of the site have been identified. These include:
- A new informal crossing point with tactile paving to facilitate crossing of Silverthorne Way;
  - Improvement to pedestrian crossing facilities across the B2150 Hambledon Road to facilitate access to local bus stops, potentially to include tactile paving and localised surface treatments; and
  - New directional cycle signing could be provided between the BAE site and the town centre, locations initially identified for improved signage include:
    - Along Elettra Avenue;
    - Crossings of B2150 Hambledon Road / Aston Road junction; and
    - Pedestrian/cycle route between B2150 Hambledon Road and Wellington Retail Park.
- 6.2.5** The need for the off-site measures set out above would be subject to review and agreement with HCC Highway officers in the context of proposals for local schemes identified to support other committed development sites in the locality.

## **6.3 Public Transport**

- 6.3.1** The BAE site will continue to be served by the existing bus connections to Waterlooville town centre, Havant, Portsmouth, Southsea, Denmead, and wider residential areas in the south-east Hampshire area.
- 6.3.2** Bus stops are located close to the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout, within a 400m walk distance of the BAE development proposals, and are served by routes 39, 40, 45/45A, 300 and X40.
- 6.3.3** As highlighted within the **Section 3.8** it is understood that other committed developments in the area will provide:
- A new bus service X39 which would divert via Newlands between Waterlooville and Crookhorn;
  - Improvements to the existing bus services 39 by increasing the frequency of the 39/X39 combined to every 10 minutes Monday to Saturday and every 30 minutes evenings and Sunday; and

- The X42 will be diverted via Newlands between Waterlooville and Widley. These service improvements will only serve to improve public transport access to the BAE site.

## 6.4 Vehicular Access

- 6.4.1 The existing point of vehicular access from the Elettra Avenue / Waterberry Drive / BAE site access roundabout will be retained to serve the site.
- 6.4.2 A 7.3m wide spine road will extend from the roundabout through the development to the southern employment area and provides access to employment and commercial uses.

## 6.5 Parking Strategy

- 6.5.1 As illustrated in the development proposals masterplan attached at [Appendix A](#), vehicle and cycle parking for the development will be provided in accordance with HCC's 'Hampshire Parking Strategy and Standards, Spring 2002'.
- 6.5.2 Parking provision will be provided between the 'maximum parking limit' and 'reduced parking in areas of high accessibility' threshold; each building plot/unit will prioritise car sharing and parking for mobility impaired people in the most accessible locations.

## 6.6 Framework Travel Plan

- 6.6.1 A package of Travel Plan measures has been set out within the FTP (provided under separate cover). These measures will encourage the adoption of sustainable modes of transport and are anticipated to include:
- Site Travel Plan Co-ordinator managing travel planning across the whole site;
  - Travel Plan Representatives at each place of occupation (in accordance with HCC standards);
  - Travel Information Packs;
  - Travel Information notice boards;
  - Site Travel Plan website including details of local car share scheme(s); and
  - Site Travel Plan Forum.
- 6.6.2 Through delivery of the FTP measures, a provisional modal shift target has been identified aiming for a reduction in single occupancy car drivers of 5.3%, with a commensurate increase in sustainable modes.

## 7 Traffic Impact

### 7.1 Introduction

**7.1.1** This section of the TAR provides details in respect of residual development impacts on the local road network. It considers the impacts of local committed development sites and reports the proportional impact of the BAE development proposals and junction capacity assessments undertaken to determine the existing and future capacity at key local junctions.

**7.1.2** The approach to assessment including the study area was agreed in principle during scoping discussions with HCC.

### 7.2 Study Area

**7.2.1** In accordance with dialogue with HCC at the 19<sup>th</sup> April 2012 scoping meeting a local study area has been defined; the key junctions identified for assessment include:

- Elettra Avenue / Waterberry Drive / BAE site access roundabout; and
- B2150 Hambledon Road/Elettra Avenue /Milton Road roundabout.

### 7.3 Observed 2012 Traffic Data

**7.3.1** Manual traffic surveys were undertaken at the two key junctions identified within the study area; fully classified turning count and queue length surveys were undertaken on Thursday 26<sup>th</sup> April 2012 between the hours of 0700-1000 and 1600-1900 by Community Systems Ltd (CSL). A copy of the traffic survey data is provided within **Appendix G**.

**7.3.2** The traffic surveys were undertaken in accordance with GTA, which states;

*'The recommended periods for data collection are spring and autumn, which include the neutral months of April, May, June, September and October as described in DMRB Volume 13, Section 1, Part 4'.*

**7.3.3** Analysis of the survey data identified the AM and PM peak traffic hours to be:

- AM Peak - 0800-0900; and
- PM peak - 1645-1745.

**7.3.4** For clarity, the observed traffic data is referred to as '2012 Observed Base'.

**7.3.5** **Figures 7-1 & 7-2** provide details of the AM and PM peak hour 2012 Observed Base traffic flows respectively.

**7.3.6** **Figures 7-3 & 7-4** provide details of the proportion of HGV vehicles in the AM and PM peak hour 2012 Observed Base traffic flows respectively.

## 7.4 Adjusted 2012 Base Traffic Data

- 7.4.1** As described in further detail in **Section 5** of this TAR, the existing site baseline has been determined through detailed analysis of the TRICS database.
- 7.4.2** The baseline BAE site vehicular trip generation has been added to the 2012 Observed Base traffic data, with the existing trip generation arising from the significantly under-occupied site extracted to avoid double counting. For clarity the adjusted traffic data is referred to as '2012 Adjusted Base'.
- 7.4.3** **Figures 7-5 & 7-6** provide details of the AM and PM peak hour 2012 Adjusted Base traffic flows respectively.
- 7.4.4** **Figures 7-7 & 7-8** provide details of the proportion of HGV vehicles in the AM and PM peak hour 2012 Adjusted Base traffic flows respectively.

## 7.5 Committed Development

- 7.5.1** As agreed with HCC, three committed developments have been considered within this TAR,, these developments are:
- Sainsbury's, Hambledon Road; and
  - West of Waterlooville MDA which comprises of:
    - Taylor Wimpey 'Wellington Park', and
    - Newlands Common.
- 7.5.2** More information in respect of these developments and associated planning applications is provided within **Section 3.8** of this TAR.
- 7.5.3** The resulting traffic flows associated from these committed developments have been sourced to inform assessment work completed within this TAR, as considered further below.

### Sainsbury's Hambledon Road

- 7.5.4** The Sainsbury's development is for a food retail building with a Gross Floor Area (GFA) of 7,745sqm and a 6 pump petrol filling station with associated kiosk facilities. The site is proposed to include 438 car parking spaces.
- 7.5.5** The proposed opening year for the Sainsbury's development was 2011, however the site has not yet been completed and therefore traffic has not been accounted for in the traffic surveys commissioned by PBA. It is assumed that the full site will be fully developed and operational before completion of the proposed BAE site. Therefore the full development traffic associated with the Sainsbury's site has been included in the future year assessment scenarios.

- 7.5.6** Sainsbury's development traffic for the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout was taken from Figures 38 and 39 of the Sainsbury's Transport Assessment (STA), dated October 2010.
- 7.5.7** The STA did not include proposed development flows through the BAE site access roundabout, in the absence of any alternative distribution and assignment assumptions any development traffic arising from the Sainsbury's proposals travelling through the BAE site access roundabout has been distributed in accordance with existing turning movements.

#### **Taylor Wimpey 'Wellington Park'**

- 7.5.8** The Taylor Wimpey Transport Assessment report, November 2004, states that the development is for 474 residential dwellings, 7.7 ha of employment and 2.8 ha of mixed use land. However the Transport Assessment Addendum Report, March 2006, states the development is for 474 residential dwellings, 7.10 ha of employment and 2.46 ha of mixed use land.
- 7.5.9** PBA are aware that a number of dwellings at the Taylor Wimpey development have already been occupied; the Taylor Wimpey on-site sales office confirmed that at the time of the surveys in April 2012, 144 dwellings of the approved 474 had been occupied.
- 7.5.10** Therefore the traffic generated by 144 dwellings is already accounted for in the 2012 traffic survey data. Accordingly, the trips generated by the 144 dwellings have been removed from the total proposed residential traffic generated by the Taylor Wimpey site.
- 7.5.11** The Transport Assessment Addendum Report does not readily enable the extraction of peak hour development flows as no details of the background traffic are provided. Therefore the AM peak hour flows associated with the Taylor Wimpey development have been taken from the Transport Assessment report, November 2004 as a worst case due to the higher development quantum.
- 7.5.12** PBA have not been able to source the corresponding PM peak hour flows. Due to the lack of available information, the PM peak hour flows have been determined by PBA based on the following:
- The PM trip rates provided in the Transport Assessment report, November 2004 (Tables 6.3, 6.5, 6.8 and 6.9) and related development information; and
  - An assumption that the distribution of PM trips is the reverse of the AM distribution.
- 7.5.13** The Transport Assessment Addendum Report also takes into account the net impact of relocating a household waste recycling centre onto the Old Park Farm site. Therefore the net impact of relocating the recycling centre traffic has also been taken into account.

#### **Newlands Common**

- 7.5.14** The Newlands development is for around 2650 residential dwellings, 19.25ha of employment land a local community centre, healthcare and elderly care facilities, two primary schools and

a nursery. Since the development is yet to commence it has been assumed that no traffic associated with the Newlands development is currently on the network.

**7.5.15** In accordance with the proposed development phasing for the Newlands development it is assumed that the total development will be complete by 2020.

**7.5.16** The traffic associated with the Newlands development at the B2150 Hambledon Road / Elettra Avenue / Milton Road roundabout was taken from the Newlands Transport Assessment (NTA), October 2010.

**7.5.17** The NTA did not include proposed development flows through the BAE site access roundabout, in the absence of any alternative distribution and assignment assumptions any development traffic arising from the Newlands proposals travelling through the BAE site access roundabout has been distributed in accordance with existing turning movements.

## **7.6 Assessment Years and Traffic Growth**

### **Assessment Years**

**7.6.1** The following assessment years have been identified:

- 2012: base year and year of planning application submission.
- 2020: future year; considered to be appropriate to reflect the potential completion of development and to align assessment years with available data from the NTA for the adjacent MDA site.

### **Traffic Growth**

**7.6.2** Due to the location and scale of the committed developments taken into consideration, it is proposed that no additional background traffic growth be added to the 2012 base traffic flows to create the 2020 future year base. This approach is consistent with the STA.

## **7.7 Distribution & Assignment**

**7.7.1** Traffic distribution of the proposed development vehicular trip generation has been undertaken using 2001 Census journey to work data for the following two output areas within which the BAE site lies:

- 24UHGE0004
- 24UHGE0031

**7.7.2** A copy of the distribution calculations is provided within **Appendix H**.

**7.7.3** The census data was used to establish where people working in the two output areas live. Using this data the proposed BAE site trips were assigned to the road network; **Table 7.1** summarises the assignment of trips from the BAE site onto the local road network:

Table 7.1: Development Trip Assignment on local road network

| Road                       | Assignment |
|----------------------------|------------|
| Milton Road                | 13.6%      |
| Aston Road                 | 0.2%       |
| B2150 West                 | 5.8%       |
| B2150 East                 | 61.9%      |
| A3 North                   | 6.2%       |
| A3 South                   | 10.1%      |
| B2150 Hambledon Road South | 2.2%       |

- 7.7.4** The assignment of HGV traffic has been based on existing turning movements; **Table 7.2** sets out the assignment of HGV trips from the BAE site onto the local road network:

Table 7.2: HGV Development Trip Assignment on local road network

| Road        | AM    |       | PM    |       |
|-------------|-------|-------|-------|-------|
|             | IN    | OUT   | IN    | OUT   |
| Milton Road | 0.0%  | 7.1%  | 20.0% | 60.0% |
| B2150 West  | 42.9% | 14.3% | 20.0% | 0.0%  |
| B2150 East  | 57.1% | 78.6% | 60.0% | 40.0% |

## 7.8 Assessment Scenarios

- 7.8.1** The assessment scenarios are;

- 2012 Observed Base (includes 144 dwellings of Taylor Wimpey development);
  - Includes observed BAE site traffic flows as per **Table 5.3**.
- 2012 Adjusted Base (includes 144 dwellings of Taylor Wimpey development);
  - Includes BAE Site Baseline traffic as per **Table 5.2**.
- 2020 Base = 2012 Adjusted Base + Committed Developments sites; and
- 2020 Base + Development = 2012 Adjusted Base – BAE Baseline traffic + Committed Developments + BAE Proposed Development Traffic.

## 7.9 Proportional Impact

- 7.9.1** **Tables 7.3** and **7.4** set out the proportional impact of the 2020 Base + Development (scenarios 1 and 2) relative to the 2020 Base at the roundabout junctions of B2150 Hambledon Road / Milton Road / Elettra Avenue and Elettra Avenue / Waterberry Drive / BAE site access. The proportional difference is set out by junction total and for each individual junction arm.
- 7.9.2** As shown within **Tables 7.3** and **7.4**, the 2020 Base + Development assessment scenario has a positive impact (i.e. a reduction in traffic flows) on both roundabouts in the AM peak period under development scenarios 1 and 2.

- 7.9.3** In the PM peak period, the BAE development traffic has a slight negative (i.e. an increase in traffic flows) impact on both roundabouts. On the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout there is an overall impact of +0.5% and +1.6% in development scenarios 1 and 2 respectively. On the Elettra Avenue / Waterberry Drive / BAE Site Access roundabout there is an overall impact of +1.8% and +5.1% in development scenarios 1 and 2 respectively.

Table 7.3: 2020 Proportional Development Impact: Scenario 1

| Junction / Link                                                | AM Peak (0800-0900) | PM Peak (1645-1745) |
|----------------------------------------------------------------|---------------------|---------------------|
| <b>B2150 Hambledon Road/Elettra Ave/Milton Road roundabout</b> | <b>-2.4%</b>        | <b>0.5%</b>         |
| Hambledon Road North approach                                  | -0.8%               | 0.6%                |
| Milton Road approach                                           | -2.3%               | 2.2%                |
| Hambledon Road South approach                                  | -7.1%               | 4.0%                |
| Elettra Avenue approach                                        | 15.4%               | -6.7%               |
| <b>Elettra Ave/Waterberry Drive/BAE Site Access roundabout</b> | <b>-7.0%</b>        | <b>1.8%</b>         |
| Elettra Avenue East approach                                   | -14.6%              | 34.7%               |
| Site Access approach                                           | 105.2%              | -22.7%              |
| Elettra Avenue West approach                                   | 0.0%                | 0.0%                |
| Waterberry Drive approach                                      | 0.0%                | 0.0%                |

Table 7.4: 2020 Proportional Development Impact: Scenario 2

| Junction / Link                                                | AM Peak (0800-0900) | PM Peak (1645-1745) |
|----------------------------------------------------------------|---------------------|---------------------|
| <b>B2150 Hambledon Road/Elettra Ave/Milton Road roundabout</b> | <b>-0.5%</b>        | <b>1.6%</b>         |
| B2150 Hambledon Road North approach                            | -0.4%               | 0.6%                |
| Milton Road approach                                           | -1.3%               | 2.1%                |
| B2150 Hambledon Road South approach                            | -3.9%               | 4.0%                |
| Elettra Avenue approach                                        | 18.4%               | -2.3%               |
| <b>Elettra Ave/Waterberry Drive/BAE Site Access roundabout</b> | <b>-1.4%</b>        | <b>5.1%</b>         |
| Elettra Avenue East approach                                   | -8.0%               | 34.2%               |
| Site Access approach                                           | 125.0%              | -7.8%               |
| Elettra Avenue West approach                                   | 0.0%                | 0.0%                |
| Waterberry Drive approach                                      | 0.0%                | 0.0%                |

- 7.9.4** The proportional impact analysis detailed above confirms a relatively small impact arising from development proposals relative to the site baseline. Notwithstanding this, in accordance with scoping discussions with HCC detailed junction capacity assessments have been undertaken and these are considered further below.

## 7.10 Junction Capacity Assessments

- 7.10.1** The Transport Research Laboratories junction capacity assessment program ARCADY (Version 8) has been used to model the roundabout junctions contained in the study area.
- 7.10.2** The assessed junctions have been modelled in the weekday AM and PM network peak hours, determined from the observed traffic flows as 0800 – 0900 and 16.45 – 17.45 respectively.

- 7.10.3** The AM peak hour traffic flows display a flat profile with a maximum 3.6% difference in flow across the four 15 minute periods; traffic flows remain fairly constant over the hour with no significant peak.
- 7.10.4** The PM peak hour traffic flows also display a flat profile with a maximum 4.3% difference in flow across the four 15 minute periods; traffic flows also remain fairly constant over the hour with no significant peak.
- 7.10.5** Accordingly the junction assessments in Arcady were undertaken using a flat traffic flow profile.

#### Calibration / Validation

- 7.10.6** The ARCADY junction models have been setup using recorded on-site measurements taken by PBA on 25<sup>th</sup> May 2012.
- 7.10.7** In order to provide an accurate representation of existing operational junction capacity, the junction models were run using 2012 Observed Base traffic flows to assess whether the junction model provided realistic results against existing local conditions.
- 7.10.8** From the model results the average queue was calculated on each junction arm in each of the modelled peak hours and compared with queue survey results recorded during the 2012 traffic surveys. Queues (stationary traffic) were recorded on a lane by lane basis at five minute intervals on each arm of the two study area junctions.
- 7.10.9** A summary of the 2012 base model results and associated calibration work is detailed below.

#### Elettra Avenue / Waterberry Drive / BAE site access roundabout

- 7.10.10** The base model was run using the 2012 Observed Base traffic flows, a comparison of the initial modelled queue results are shown against surveyed queues in **Table 7.5**.

Table 7.5: Elettra Avenue / Waterberry Drive / BAE site access roundabout Comparison of Surveyed and Modelled Queues

| Link                                                                  | AM Peak        |                | PM Peak        |                |
|-----------------------------------------------------------------------|----------------|----------------|----------------|----------------|
|                                                                       | Surveyed Queue | Modelled Queue | Surveyed Queue | Modelled Queue |
| <b>Elettra Avenue / Waterberry Drive / BAE site access roundabout</b> |                |                |                |                |
| Elettra Avenue (East)                                                 | 0              | 0              | 0              | 0              |
| BAE Access                                                            | 0              | 0              | 0              | 0              |
| Elettra Avenue (West)                                                 | 0              | 0              | 0.9            | 0.4            |
| Waterberry Drive                                                      | 0              | 0              | 0              | 0              |

- 7.10.11** From the results in **Table 7.5** it can be seen that the ARCADY model estimates similar queues in the AM and PM peaks compared with the surveyed queues. Therefore, it is considered that the model is accurate, robust and suitable for development assessment scenarios.

### B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout

- 7.10.12** The base model was run using the 2012 Observed Base traffic flows, a comparison of the initial modelled queue results are shown against surveyed queues in **Table 7.6**.

Table 7.6: B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout Comparison of Surveyed and Modelled Queues (Pre-calibration)

| Link                                                                  | AM Peak        |                | PM Peak        |                |
|-----------------------------------------------------------------------|----------------|----------------|----------------|----------------|
|                                                                       | Surveyed Queue | Modelled Queue | Surveyed Queue | Modelled Queue |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                |                |                |                |
| Milton Road                                                           | 1              | 4              | 0              | 1              |
| Hambledon Road (South)                                                | 1              | 1              | 0              | 2              |
| Elettra Avenue                                                        | 0              | 0              | 6              | 1              |
| Hambledon Road (North)                                                | 1              | 1              | 4              | 1              |

- 7.10.13** From the results in **Table 7.6** it can be seen that in the AM peak period the ARCADY model overestimates the queue on the Milton Road arm compared with the surveyed queues and underestimates the queue on the Hambledon Road north and Elettra Avenue arms in the PM peak.
- 7.10.14** In order to undertake a robust assessment in the AM peak period the capacity adjustment function (percentage) of ARCADY 8 has been used to calibrate the roundabout in the AM peak to provide similar modelled queues when compared with surveyed queues.
- 7.10.15** Following detailed review of the queue surveys in the PM peak, it was observed that vehicles leave Brambles Business Park via Elettra Avenue in short periods. At the same time, concurrently, vehicles arrive at the Hambledon Road north arm in platoons due to the delay caused by the toucan crossing upstream. Therefore irregular queues occur on Hambledon Road north which cannot be replicated within ARCADY. These queues are shown in **Table 7.7** below:

Table 7.7: B2150 Hambledon Road/Milton Road/Elettra Avenue Irregular Queues

| Time                            | Hambledon Road (N) |        | Elettra Avenue |        |
|---------------------------------|--------------------|--------|----------------|--------|
|                                 | Lane 1             | Lane 2 | Lane 1         | Lane 2 |
| 16:45                           | 4                  | 0      | 4              | 5      |
| 16:50                           | 3                  | 2      | 2              | 5      |
| 16:55                           | 5                  | 3      | 0              | 4      |
| 17:00                           | 4                  | 2      | 7              | 9      |
| 17:05                           | 15                 | 13     | 12             | 13     |
| 17:10                           | 5                  | 2      | 9              | 16     |
| 17:15                           | 2                  | 2      | 3              | 6      |
| 17:20                           | 4                  | 1      | 6              | 7      |
| 17:25                           | 3                  | 1      | 2              | 3      |
| 17:30                           | 5                  | 2      | 3              | 2      |
| 17:35                           | 6                  | 2      | 4              | 7      |
| 17:40                           | 2                  | 2      | 10             | 15     |
| Average Q                       | 4                  |        | 6              |        |
| Average Q (removed irregular Q) | 3                  |        | 4              |        |

**7.10.16** As shown in **Table 7.7**, irregular queues occur once on Hambledon Road north and three times on Elettra Avenue. In order to calibrate the ARCADY model these irregular queues (shown in red in **Table 7.7**) have been removed and lane queue averages recalculated.

**7.10.17** The 2012 model was re-run using the capacity adjustment function; a comparison of the queue results are shown in **Table 7.8**.

Table 7.8: B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout Comparison of Surveyed and Modelled Queues (Post-calibration)

| Link                                                                  | AM Peak        |                | PM Peak        |                |
|-----------------------------------------------------------------------|----------------|----------------|----------------|----------------|
|                                                                       | Surveyed Queue | Modelled Queue | Surveyed Queue | Modelled Queue |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                |                |                |                |
| Milton Road                                                           | 1              | 2              | 0              | 1              |
| Hambledon Road (South)                                                | 1              | 1              | 0              | 2              |
| Elettra Avenue                                                        | 0              | 0              | 4              | 3              |
| Hambledon Road (North)                                                | 1              | 1              | 3              | 2              |

**7.10.18** From the results in **Table 7.8** it can be seen the adjusted ARCADY model estimates similar queues in the AM and PM peaks compared with the surveyed queues. Therefore, the adjusted model is considered to be accurate, robust and suitable for development assessment scenarios.

### 2012 Adjusted Base Assessments

**7.10.19** The 2012 Adjusted Base vehicular traffic flows for the local road network are illustrated in **Figures 7-5** and **7-6** in the AM and PM peaks respectively with HGV percentage figures illustrated in **Figures 7-7** and **7-8**.

**7.10.20** A summary of the 2012 Adjusted Base year ARCADY assessments results are provided in **Table 7.9**.

Table 7.9: 2012 Base ARCADY Assessment Results

| Junction                                                              | 2012 Base Flows |      |               |      |       |               |
|-----------------------------------------------------------------------|-----------------|------|---------------|------|-------|---------------|
|                                                                       | AM              |      |               | PM   |       |               |
|                                                                       | RFC             | MMQ  | Max Delay (s) | RFC  | MMQ   | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                 |      |               |      |       |               |
| Elettra Avenue (East)                                                 | 0.43            | 0.75 | 3.21          | 0.12 | 0.13  | 2.10          |
| BAE Access                                                            | 0.02            | 0.02 | 1.84          | 0.11 | 0.13  | 1.83          |
| Elettra Avenue (West)                                                 | 0.03            | 0.03 | 2.29          | 0.09 | 0.10  | 2.33          |
| Waterberry Drive                                                      | 0.12            | 0.13 | 2.35          | 0.29 | 0.40  | 3.14          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                 |      |               |      |       |               |
| Milton Road                                                           | 0.71            | 2.36 | 13.1          | 0.60 | 1.47  | 12.86         |
| Hambledon Road (South)                                                | 0.59            | 1.43 | 3.94          | 0.62 | 1.66  | 3.97          |
| Elettra Avenue                                                        | 0.20            | 0.25 | 3.16          | 0.97 | 18.80 | 84.61         |
| Hambledon Road (North)                                                | 0.54            | 1.19 | 4.7           | 0.72 | 2.56  | 15.48         |

- 7.10.21** It can be seen from **Table 7.9** that the Elettra Avenue / Waterberry Drive/ BAE site access roundabout will operate under capacity in both the AM and PM peak periods with a maximum RFC of 0.43 on the Elettra Avenue (East) arm in the AM peak.
- 7.10.22** It can also be seen from **Table 7.9** that the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate under capacity in the AM peak and approaching capacity in the PM peak with a maximum RFC of 0.97 on the Elettra Avenue arm in the PM peak period.
- 7.10.23** A copy of the full output files are provided within **Appendix I**.

#### 2020 Base Assessments

- 7.10.24** The 2020 Base vehicular traffic flows for the local road network are illustrated in **Figures 7-9** and **7-10** in the AM and PM peaks respectively with HGV percentage figures illustrated in **Figures 7-11** and **7-12**.
- 7.10.25** A summary of the 2020 Base year ARCADY assessments results are provided in **Table 7.10**.

Table 7.10: 2020 Base ARCADY Assessment Results

| Junction                                                              | 2020 Base Flows |      |               |      |       |               |
|-----------------------------------------------------------------------|-----------------|------|---------------|------|-------|---------------|
|                                                                       | AM              |      |               | PM   |       |               |
|                                                                       | RFC             | MMQ  | Max Delay (s) | RFC  | MMQ   | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                 |      |               |      |       |               |
| Elettra Avenue (East)                                                 | 0.44            | 0.77 | 3.26          | 0.12 | 0.13  | 2.10          |
| BAE Access                                                            | 0.02            | 0.02 | 1.85          | 0.12 | 0.13  | 1.83          |
| Elettra Avenue (West)                                                 | 0.03            | 0.03 | 2.31          | 0.09 | 0.10  | 2.34          |
| Waterberry Drive                                                      | 0.12            | 0.13 | 2.35          | 0.30 | 0.42  | 3.19          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                 |      |               |      |       |               |
| Milton Road                                                           | 0.81            | 4.08 | 20.57         | 0.75 | 2.94  | 22.36         |
| Hambledon Road (South)                                                | 0.64            | 1.76 | 4.47          | 0.65 | 1.81  | 4.24          |
| Elettra Avenue                                                        | 0.21            | 0.26 | 3.35          | 1.04 | 46.33 | 193.23        |
| Hambledon Road (North)                                                | 0.58            | 1.35 | 5.08          | 0.86 | 5.58  | 28.93         |

- 7.10.26** It can be seen from **Table 7.10** that the Elettra Avenue / Waterberry Drive/ BAE site access roundabout will continue to operate under capacity in both the AM and PM peak periods with a maximum RFC of 0.44 on the Elettra Avenue (East) arm in the AM peak.
- 7.10.27** It can also be seen from **Table 7.10** that the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate over capacity in the PM peak period with a maximum RFC of 1.04 on the Elettra Avenue arm in the PM peak period.
- 7.10.28** A copy of the full output files are provided within **Appendix J**.

## 2020 Base + Development: Scenario 1 Assessments

- 7.10.29** The 2020 Base + Development Scenario 1 vehicular traffic flows for the local road network are illustrated in **Figures 7-13** and **7-14** in the AM and PM peaks respectively with HGV percentage figures illustrated in **Figures 7-15** and **7-16**.
- 7.10.30** A summary of the 2020 Base + BAE development Scenario 1 ARCADY assessments results are provided in **Table 7.11**.
- 7.10.31** The assessments have been undertaken with revised geometry for the BAE access arm to reflect the revised access as shown on the BAE development proposals masterplan provided within **Appendix A**.

Table 7.11: 2020 Base + BAE development ARCADY Assessment Results – Scenario 1

| Junction                                                              | 2020 Base + Development, Scenario 1 Flows |      |               |      |      |               |
|-----------------------------------------------------------------------|-------------------------------------------|------|---------------|------|------|---------------|
|                                                                       | AM                                        |      |               | PM   |      |               |
|                                                                       | RFC                                       | MMQ  | Max Delay (s) | RFC  | MMQ  | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                                           |      |               |      |      |               |
| Elettra Avenue (East)                                                 | 0.38                                      | 0.60 | 2.96          | 0.16 | 0.18 | 2.21          |
| BAE Access                                                            | 0.05                                      | 0.06 | 2.34          | 0.10 | 0.11 | 2.10          |
| Elettra Avenue (West)                                                 | 0.03                                      | 0.03 | 2.35          | 0.09 | 0.10 | 2.28          |
| Waterberry Drive                                                      | 0.12                                      | 0.14 | 2.40          | 0.29 | 0.41 | 3.08          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                                           |      |               |      |      |               |
| Milton Road                                                           | 0.81                                      | 4.13 | 21.33         | 0.76 | 2.99 | 22.24         |
| Hambledon Road (South)                                                | 0.59                                      | 1.44 | 3.94          | 0.68 | 2.07 | 4.66          |
| Elettra Avenue                                                        | 0.24                                      | 0.32 | 3.52          | 0.97 | 17.7 | 83.62         |
| Hambledon Road (North)                                                | 0.58                                      | 1.38 | 5.23          | 0.85 | 5.28 | 27.19         |

- 7.10.32** It can be seen from **Table 7.11** that the Elettra Avenue / Waterberry Drive/ BAE site access roundabout will operate under capacity in both the AM and PM peak periods with a maximum RFC of 0.38 on the Elettra Avenue (East) arm in the AM peak.
- 7.10.33** It can also be seen from **Table 7.11** that the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate under capacity in the AM peak and approaching capacity in the PM peak with a maximum RFC of 0.97 on the Elettra Avenue arm in the PM peak period.
- 7.10.34** The B2150 Hambledon Road / Milton Road / Elettra Avenue PM peak assessment predicts an improved operational performance relative to the 2020 base assessment, with a reduced maximum RFC on the Elettra Avenue arm and significantly reduced queue; this is due to a more balanced pattern of traffic entering and leaving Elettra Avenue as a result of the proposed development.
- 7.10.35** A copy of the full output files are provided within **Appendix K**.

## 2020 Base + Development: Scenario 2 Assessments

- 7.10.36** The 2020 Base + Development Scenario 2 vehicular traffic flows for the local road network are illustrated in **Figures 7-17** and **7-18** in the AM and PM peaks respectively with HGV percentage figures illustrated in **Figures 7-19** and **7-20**.

**7.10.37** A summary of the 2020 Base + BAE development year Scenario 2 ARCADY assessments results are provided in **Table 7.12**.

**7.10.38** The assessments have been undertaken with revised geometry for the BAE access arm to reflect the revised access as shown on the BAE development proposals masterplan provided within **Appendix A**.

Table 7.12: 2020 Base + BAE development ARCADY Assessment Results – Scenario 2

| Junction                                                              | 2020 Base + Development, Scenario 2 Flows |      |               |      |       |               |
|-----------------------------------------------------------------------|-------------------------------------------|------|---------------|------|-------|---------------|
|                                                                       | AM                                        |      |               | PM   |       |               |
|                                                                       | RFC                                       | MMQ  | Max Delay (s) | RFC  | MMQ   | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                                           |      |               |      |       |               |
| Elettra Avenue (East)                                                 | 0.40                                      | 0.68 | 3.10          | 0.15 | 0.18  | 2.18          |
| BAE Access                                                            | 0.06                                      | 0.06 | 2.27          | 0.12 | 0.14  | 2.13          |
| Elettra Avenue (West)                                                 | 0.03                                      | 0.03 | 2.36          | 0.09 | 0.10  | 2.32          |
| Waterberry Drive                                                      | 0.12                                      | 0.14 | 2.40          | 0.29 | 0.41  | 3.15          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                                           |      |               |      |       |               |
| Milton Road                                                           | 0.82                                      | 4.52 | 23.18         | 0.77 | 3.16  | 23.59         |
| Hambledon Road (South)                                                | 0.61                                      | 1.58 | 4.17          | 0.67 | 2.05  | 4.63          |
| Elettra Avenue                                                        | 0.25                                      | 0.33 | 3.5           | 1.01 | 32.88 | 143.11        |
| Hambledon Road (North)                                                | 0.58                                      | 1.40 | 5.28          | 0.86 | 5.63  | 29.05         |

**7.10.39** It can be seen from **Table 7.12** that the Elettra Avenue / Waterberry Drive/ BAE site access roundabout will operate under capacity in both the AM and PM peak periods with a maximum RFC of 0.40 on the Elettra Avenue (East) arm in the AM peak.

**7.10.40** It can also be seen from **Table 7.12** that B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate under capacity in the AM peak and over capacity in the PM peak period with a maximum RFC of 1.01 on the Elettra Avenue arm.

**7.10.41** The B2150 Hambledon Road / Milton Road / Elettra Avenue PM peak assessment predicts an improved operational performance relative to the 2020 base assessment, with a reduced maximum RFC on the Elettra Avenue arm and significantly reduced queue; this is due to a more balanced pattern of traffic entering and leaving Elettra Avenue as a result of the proposed development.

**7.10.42** A copy of the full output files are provided within **Appendix L**.

### Summary

**7.10.43** This section of the TAR has considered the impact of the BAE development proposals in respect of vehicular trip generation and impacts on the local highway network. The future impacts of local committed development sites have been taken into consideration with regard to the defined study area agreed with HCC during scoping discussions; and the outcomes of proportional impact and detailed junction capacity assessments have been presented.

- 7.10.44** The proportional impact of the BAE development proposals on AM and PM peak traffic movements through the junctions in the study area is considered marginal when compared with traffic flows in the future base without development.
- 7.10.45** During the AM peak there is a reduction in traffic flow through both the Elettra Avenue / Waterberry Drive/ BAE site access roundabout and B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout.
- 7.10.46** During the PM peak period, analysis indicates that traffic flows at the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout would increase between 0.5% and 1.6% for development scenarios 1 and 2 respectively.
- 7.10.47** Junction capacity assessments have confirmed the Elettra Avenue / Waterberry Drive / BAE site access roundabout will operate within capacity under base and future year assessment scenarios with and without redevelopment of the BAE site.
- 7.10.48** Junction capacity assessments indicate that the Elettra Avenue arm of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout would operate above capacity in the 2020 base year (PM peak) without the redevelopment of the BAE site.
- 7.10.49** With the BAE development proposals, the Elettra Avenue arm of the junction continues to operate close to and at capacity during the PM peak under development scenarios 1 and 2. In both scenarios there is a reduction in queuing and delay compared to the 2020 base situation without development. This is due to a more balanced pattern of traffic entering and leaving Elettra Avenue as a result of the proposed development.
- 7.10.50** Against this background it is considered that whilst there is a marginal increase in traffic flow through the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout during the PM peak this would not materially affect the operational performance. Indeed, analysis suggests that with the BAE development proposals there would be some operational betterment over the 2020 base situation without development.

## 8 Mitigation

### 8.1 Framework Travel Plan (FTP)

- 8.1.1 As detailed in **Section 6** a package of measures will be provided as part of an FTP. The FTP is submitted under separate cover and aims to encourage the use of sustainable transport modes for journeys to and from the site and reduce single car occupancy trips.
- 8.1.2 Subsidiary Travel Plans would be prepared by future occupiers of the site adhering to the aims objectives and targets of the FTP.
- 8.1.3 The FTP identifies a minimum target reduction in single occupancy car trips of 7.5% to offset the traffic impacts of BAE development proposals over and above the traffic baseline equivalent to the current consented uses on the site.
- 8.1.4 Performance against agreed targets would be monitored for a minimum period of five years
- 8.1.5 In the event that agreed targets are not met at the end of the monitoring period it may be appropriate to consider 'failsafe' measures in order to manage future travel demand to and from the development to the baseline level. This could include local highway measures as set out below.

### 8.2 Highway Intervention

- 8.2.1 As shown on **PBA Drawing 26365/004/SK003** it is feasible that the flare on the Elettra Avenue arm of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout could be increased by 25m through alterations to the existing road markings.
- 8.2.2 The increased flare will provide additional stacking space ahead of the give-way line on the Elettra Avenue approach to the roundabout with the B2150 Hambledon Road / Milton Road, providing additional capacity on Elettra Avenue arm.
- 8.2.3 It should be noted that this increase in flare will decrease the flare length of the Elettra Avenue (East) arm of the Elettra Avenue / Waterberry Drive / BAE site access roundabout.
- 8.2.4 A copy **PBA Drawing 26365/004/SK003** is provided within **Appendix M**.
- 8.2.5 Both the Elettra Avenue / Waterberry Drive / BAE site access roundabout and B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout have been tested with the revised geometry resulting from the flare alterations described above.
- 8.2.6 A summary of the ARCADY assessment results have been run with the highway intervention improvements and results provided within **Tables 8.1-8.3** below.

Table 8.1: 2020 Base ARCADY Assessment Results with highway intervention

| Junction                                                              | 2020 Base Flows |      |               |      |       |               |
|-----------------------------------------------------------------------|-----------------|------|---------------|------|-------|---------------|
|                                                                       | AM              |      |               | PM   |       |               |
|                                                                       | RFC             | MMQ  | Max Delay (s) | RFC  | MMQ   | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                 |      |               |      |       |               |
| Elettra Avenue (East)                                                 | 0.51            | 1.05 | 4.42          | 0.14 | 0.16  | 2.52          |
| BAE Access                                                            | 0.02            | 0.02 | 1.85          | 0.11 | 0.13  | 1.83          |
| Elettra Avenue (West)                                                 | 0.03            | 0.03 | 2.31          | 0.09 | 0.10  | 2.34          |
| Waterberry Drive                                                      | 0.12            | 0.13 | 2.35          | 0.30 | 0.42  | 3.19          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                 |      |               |      |       |               |
| Milton Road                                                           | 0.81            | 4.08 | 20.57         | 0.76 | 3.07  | 23.38         |
| Hambledon Road (South)                                                | 0.64            | 1.76 | 4.47          | 0.65 | 1.81  | 4.24          |
| Elettra Avenue                                                        | 0.20            | 0.25 | 3.19          | 0.99 | 23.81 | 103.49        |
| Hambledon Road (North)                                                | 0.58            | 1.35 | 5.08          | 0.86 | 5.93  | 30.88         |

**8.2.7** It can be seen from **Table 8.1** that the Elettra Avenue / Waterberry Drive / BAE site access roundabout will continue to operate under capacity in both the AM and PM peak periods for the 2020 Base scenario with a maximum RFC of 0.51 on the Elettra Avenue (East) arm in the AM peak.

**8.2.8** It can also be seen from **Table 8.1** that the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate approaching capacity in the PM peak period for the 2020 Base scenario with a maximum RFC of 0.99 on the Elettra Avenue arm in the PM peak.

Table 8.2: 2020 Base + Development ARCADY Assessment Results – Scenario 1 with highway intervention

| Junction                                                              | 2020 Base + Development, Scenario 1 Flows |      |               |      |       |               |
|-----------------------------------------------------------------------|-------------------------------------------|------|---------------|------|-------|---------------|
|                                                                       | AM                                        |      |               | PM   |       |               |
|                                                                       | RFC                                       | MMQ  | Max Delay (s) | RFC  | MMQ   | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                                           |      |               |      |       |               |
| Elettra Avenue (East)                                                 | 0.44                                      | 0.79 | 3.88          | 0.18 | 0.22  | 2.68          |
| BAE Access                                                            | 0.05                                      | 0.06 | 2.34          | 0.1  | 0.11  | 2.1           |
| Elettra Avenue (West)                                                 | 0.03                                      | 0.03 | 2.35          | 0.09 | 0.10  | 2.28          |
| Waterberry Drive                                                      | 0.12                                      | 0.14 | 2.40          | 0.29 | 0.41  | 3.08          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                                           |      |               |      |       |               |
| Milton Road                                                           | 0.81                                      | 4.13 | 21.33         | 0.76 | 3.02  | 22.43         |
| Hambledon Road (South)                                                | 0.59                                      | 1.44 | 3.94          | 0.68 | 2.07  | 4.66          |
| Elettra Avenue                                                        | 0.23                                      | 0.31 | 3.34          | 0.92 | 10.28 | 48.82         |
| Hambledon Road (North)                                                | 0.58                                      | 1.38 | 5.23          | 0.85 | 5.36  | 27.53         |

**8.2.9** It can be seen from **Table 8.2** that the Elettra Avenue / Waterberry Drive / BAE site access roundabout will continue to operate under capacity in both the AM and PM peak periods for the 2020 Base + Development Scenario 1 with a maximum RFC of 0.44 on the Elettra Avenue (East) arm in the AM peak.

**8.2.10** It can also be seen from **Table 8.2** that the B2150 Hambledon Road / Elettra Avenue / Milton Road roundabout will operate within capacity in the PM peak period for the 2020

Base + Development Scenario 1 with a maximum RFC of 0.92 on the Elettra Avenue arm in the PM peak.

Table 8.3: 2020 Base + Development ARCADY Assessment Results – Scenario 2 with highway intervention

| Junction                                                              | 2020 Base + Development, Scenario 2 Flows |      |               |      |      |               |
|-----------------------------------------------------------------------|-------------------------------------------|------|---------------|------|------|---------------|
|                                                                       | AM                                        |      |               | PM   |      |               |
|                                                                       | RFC                                       | MMQ  | Max Delay (s) | RFC  | MMQ  | Max Delay (s) |
| <b>Elettra Avenue / Waterberry Drive /BAE site access roundabout</b>  |                                           |      |               |      |      |               |
| Elettra Avenue (East)                                                 | 0.47                                      | 0.9  | 4.12          | 0.18 | 0.22 | 2.65          |
| BAE Access                                                            | 0.06                                      | 0.06 | 2.27          | 0.12 | 0.14 | 2.13          |
| Elettra Avenue (West)                                                 | 0.03                                      | 0.03 | 2.36          | 0.09 | 0.10 | 2.32          |
| Waterberry Drive                                                      | 0.12                                      | 0.14 | 2.40          | 0.29 | 0.41 | 3.15          |
| <b>B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout</b> |                                           |      |               |      |      |               |
| Milton Road                                                           | 0.82                                      | 4.52 | 23.18         | 0.77 | 3.26 | 24.30         |
| Hambledon Road (South)                                                | 0.61                                      | 1.58 | 4.17          | 0.67 | 2.05 | 4.63          |
| Elettra Avenue                                                        | 0.24                                      | 0.31 | 3.32          | 0.96 | 16.9 | 76.5          |
| Hambledon Road (North)                                                | 0.58                                      | 1.4  | 5.28          | 0.86 | 5.86 | 30.28         |

- 8.2.11** It can also be seen from **Table 8.3** that the Elettra Avenue / Waterberry Drive / BAE site access roundabout will continue to operate under capacity in both the AM and PM peak periods for the 2020 Base + Development Scenario 2 with a maximum RFC of 0.47 on the Elettra Avenue (East) arm in the AM peak.
- 8.2.12** It can be seen from **Table 8.3** that the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout will operate within, albeit, approaching capacity in the PM peak period for the 2020 Base + Development Scenario 2 with a maximum RFC of 0.96 on the Elettra Avenue arm in the PM peak.
- 8.2.13** A copy of the full output files associated with the highway intervention assessments are provided within **Appendix N**.
- 8.2.14** The implementation and delivery of the FTP and Subsidiary Travel Plans including targets and mechanisms for future monitoring and intervention could be secured through S106 and or appropriately worded planning conditions associated with any consent for the site.
- 8.2.15** The requirement for implementing the highway interventions remains subject to the HCC detailed review of this TAR and on-going discussions between HCC and PBA, on behalf of BAE Systems.

## 9 Conclusion

- 9.1.1** This Transport Assessment Report (TAR) has been prepared by Peter Brett Associates LLP on behalf of BAE Systems and considers the implications of the proposed redevelopment of the existing site for mixed use development comprising of B class uses, hotel, a restaurant, a restaurant with drive-through facility and car showroom facilities.
- 9.1.2** The TAR follows scoping discussions with HCC as the local highway authority and has been undertaken in accordance with the principles agreed as part of technical discussions held on the 19<sup>th</sup> April 2012.
- 9.1.3** The assessment has included a review of relevant national and local policy documents as well as an overview of the existing conditions in the locality of the BAE site including a description of local facilities, walk and cycle routes in the area, public transport, the local highway network and traffic flows, a review of personal injury collision data and the anticipated impacts of local committed development sites.
- 9.1.4** Future travel demand associated with the BAE development proposals has been predicted and compared with the site baseline. The residual impacts of the BAE development proposals on the local road network in the immediate vicinity of the site have also been assessed. The conclusions drawn from the assessment are summarised below.
- 9.1.5** The BAE site is situated within the Brambles Business Park within close proximity to a wide range of local facilities and services, Waterlooville town centre and adjacent residential areas.
- 9.1.6** The BAE site is considered to be readily accessible by walking, cycling and public transport modes as demonstrated by accessibility modelling undertaken within this TAR; future employees and visitors to the site will readily be able to access local residential areas and the extensive local facilities and amenities located in Waterlooville.
- 9.1.7** The BAE site access strategy has been identified with proposals to retain the primary point of access via the Elettra Avenue / Waterberry Drive / BAE site access roundabout. A separate emergency access will be provided onto Silverthorne Way.
- 9.1.8** A supporting transport strategy has also been identified, incorporating measures designed into the BAE development proposals masterplan to provide an accessible and functional scheme which seeks to encourage access by sustainable modes.
- 9.1.9** The travel demand for the existing consented uses on the site has been estimated to establish the current site traffic baseline. This has been compared with predicted demand arising from the BAE development proposals which indicates that future site traffic conditions are expected to result in a reduction in vehicle trips in the AM peak and slight increase in trips during the PM peak compared to the site baseline situation.
- 9.1.10** Detailed junction capacity assessments have been undertaken for the 2020 future year. The capacity assessments indicate that the Elettra Avenue / Waterberry Drive / BAE site access

roundabout would operate with spare capacity during both the AM and PM network peak travel periods with and without development at the BAE site.

- 9.1.11** Junction capacity assessments indicate that the Elettra Avenue arm of the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout would operate above capacity in the 2020 base year (PM peak) without the redevelopment of the BAE site.
- 9.1.12** With the BAE development proposals, the Elettra Avenue arm of the junction continues to operate close to and at capacity during the PM peak under development scenarios 1 and 2. In both scenarios there is a reduction in queuing and delay compared to the 2020 base situation without development. This is due to a more balanced pattern of traffic entering and leaving Elettra Avenue as a result of the proposed development.
- 9.1.13** Against this background it is considered that whilst development would result in a relatively small increase in traffic flow through the B2150 Hambledon Road / Milton Road / Elettra Avenue roundabout during the PM peak this would not materially affect the operational performance of the junction under future traffic conditions. Indeed, analysis suggests that with the BAE development proposals there would be some operational betterment over the 2020 base situation without development.
- 9.1.14** In view of the above, it is considered that the residual impacts of development can be satisfactorily addressed through travel plan measures which target the reduction in single car occupancy for journeys to and from the site. Measures would be secured under the provisions of a Framework Travel Plan including commitments to the implementation of Subsidiary Travel Plans to be delivered by future site occupiers.
- 9.1.15** Provisional targets have been identified in the FTP accompanying this TAR which seeks to reduce single car occupancy journeys by a minimum of 7.5% on full occupation of the proposed development in order to mitigate the residual impacts of BAE development proposals over the site baseline.
- 9.1.16** The FTP recognises that in the event that agreed targets are not met at the end of the travel plan monitoring period it may be appropriate to consider wider intervention measures in order to manage future travel demand to and from the proposed development. This could include 'failsafe' interventions comprising modest highway improvements to provide additional stacking space ahead of the give-way line on the Elettra Avenue approach to the roundabout with the B2150 Hambledon Road / Milton Road as illustrated in **PBA Drawing 26365/004/SK003** at **Appendix M**.
- 9.1.17** The implementation and delivery of the FTP and Subsidiary Travel Plans including targets and mechanisms for future monitoring and intervention could be secured through S106 and or appropriately worded planning conditions associated with any consent for the site.
- 9.1.18** The conclusions drawn from the Transport Assessment process would be subject to further consultation with HCC as the Local Highway Authority during the post application review period and serve as a basis for agreeing the package of transport measures to support the site and mechanisms for future delivery.

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## References

- a) Department for Transport. (2007) *Guidance on Transport Assessment*
- b) Department of Communities and Local Government. (2012) *National Planning Policy Framework*
- c) Hampshire County Council. (2011) *Hampshire Local Transport Plan 2011-2031*
- d) Hampshire County Council. *Shaping our future together, Hampshire Sustainable Community Strategy, 2008-2018*
- e) Havant Borough Council. (Adopted March 2011) *Havant Borough Core Strategy*
- f) Mayer Brown (2010) *Proposed Sainsbury's Supermarket Hambledon Road, Waterlooville, Transport Assessment*
- g) WSP (2004) *Old Park Farm, Waterlooville, Transport Assessment Report*
- h) WSP (2006) *Old Park Farm, Waterlooville, Transport Assessment Addendum Report*
- i) Mayer Brown (2010) *Newlands Development, West of Waterlooville MDA, Transport Assessment*
- j) Hampshire County Council. *Hampshire County Structure Plan 1996-2011*
- k) Hampshire County Council. (Spring 2002) *Hampshire Parking Strategy and Standards*

## Figures

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## **Appendices (provided on enclosed CD)**