



COLLEGE ROAD, CAMPDOWN

TRANSPORT ASSESSMENT

November 2019

Persimmon Homes

**RESIDENTIAL DEVELOPMENT
COLLEGE ROAD,
CAMPDOWN**

TRANSPORT ASSESSMENT

CONTROLLED DOCUMENT

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Contents

1. INTRODUCTION.....	3
2. EXISTING CONDITIONS.....	6
3. LOCAL ACCESSIBILITY.....	12
4. PLANNING POLICY	22
5. DEVELOPMENT PROPOSALS.....	25
6. TRAFFIC IMPACT ASSESSMENT, TRIP DISTRIBUTION AND ROUTE ASSIGNMENT	27
7. ACCESS ARRANGEMENT	37
8. JUNCTION CAPACITY ASSESSMENT	41
9. HIGHWAY MITIGATION.....	51
10. SUMMARY AND CONCLUSIONS.....	57

Figures

- Figure 1 – Site Location
- Figure 2 – Site Context (Source: Google)
- Figure 3 – Wider Site Location
- Figure 4 – PIA Data: College Road
- Figure 5 – Public Rights of Way near the Site
- Figure 6 – Local Cycle Routes (Source: Havant Borough Council Cycle Network 2017)
- Figure 7 – Trip Distribution from Site Access
- Figure 8 – Trip Distribution at College Road/Purbrook Way Junction
- Figure 9 – Trip Distribution at Purbrook Way/Stakes Hill Road/ Crookhorn Lane Junction
- Figure 10 – Trip Distribution at A3(M) Junction on-slip and off-slip
- Figure 11 – Trip Distribution at ASDA Roundabout
- Figure 12 – Trip Distribution at Crookhorn Lane/Portsdown Hill Road Junction
- Figure 13 – Identified Connection Point onto Scratchface Lane
- Figure 14 – Potential Locations of New Bus Stops
- Figure 15 – Location of Local Junctions Requiring Assessment

Tables

- Table 1 – Proximity of Local Amenities
- Table 2 – Local Bus Services: College Road
- Table 3 – Local Bus Services: Crookhorn Lane
- Table 4 – Phase 1 Accommodation Schedule
- Table 5 – Phase 1 Required Parking Provision
- Table 6 – Proposed Vehicle Trip Generation
- Table 7 – Proposed Pedestrian Trip Generation
- Table 8 – Agreed Trip Distributions
- Table 9 – Route Assignment

Table 10 – Crookhorn Lane/Portsdown Hill Road Turning Count Data
Table 11 – Bedhampton Hill/Portsdown Hill Road/Bedhampton Hill Road Turning Count Data
Table 12 – College Road/Purbrook Way Turning Count Data
Table 13 – Stakes Hill Road/Stakes Road/Purbrook Way Turning Count Data
Table 14 – A3(M) Off-slip Roundabout Turning Count Data
Table 15 – A3(M) On-slip Way Roundabout Turning Count Data
Table 16 – TEMPRO Growth Rates
Table 17 – College Road Traffic Flows
Table 18 – Site Access Capacity Assessment
Table 19 – Crookhorn Lane/Purbrook Way Junction – Existing Configuration
Table 20 – College Road/Purbrook Way Junction Capacity Assessment
Table 21 – Stakes Hill/Purbrook Way Capacity Assessment
Table 22 – Stakes Hill Road Roundabout Improved Configuration
Table 23 – A3(M) Roundabouts – Existing Configuration
Table 24 – ASDA Roundabout Junction Capacity Assessment (2026 HCC Baseline Scenario)
Table 25 – ASDA Roundabout Junction Capacity Assessment (2026 HCC Baseline + Development Flows)
Table 26 – Summary of Junction Capacity Assessments
Table 27 – Crookhorn Lane/Portsdown Hill Road – Improved Configuration
Table 28 – Purbrook Way/College Road – Improved Configuration
Table 29 – Stakes Hill Road/Stakes Road/Purbrook Way/Crookhorn Lane – Improved Configuration
Table 30 – A3(M) Roundabouts – Improved Configuration

Appendices

Appendix A – Site Layout
Appendix B – ATC/Turning Count Data
Appendix C – Collision Data
Appendix D – Accessibility Map
Appendix E – Internal/Junction Visibility Splays
Appendix F – Refuse racking
Appendix G – Fire Tracking
Appendix H – TRICS Outputs
Appendix I – Trojans Flow Data
Appendix J – 2011 Census Data
Appendix K – Flow Diagrams
Appendix L – Site Access Design
Appendix M – Proposed bus stops on College Road
Appendix N – Non-Motorised User Audit
Appendix O – Site Access Modelling
Appendix P – Crookhorn Lane/Portsdown Hill Road Modelling
Appendix Q – College Road/Purbrook Way Modelling
Appendix R – Stakes Hill/ Purbrook Way Modelling (Existing and Signalised)
Appendix S – A3(M) Roundabouts Modelling
Appendix T – ASDA Modelling
Appendix U – Crookhorn Lane Roundabout Design, Signal Design and Revised Modelling
Appendix V – College Road/Purbrook Way, Junction Design and Revised Modelling
Appendix W – A3(M) Roundabouts Junction Design and Revised Modelling

1. INTRODUCTION

- 1.1 This Transport Assessment (TA) has been prepared by Paul Basham Associates on behalf of Persimmon Homes to support a hybrid planning application for a residential development comprising up to 780 dwellings at Land east of College Road, Campdown, Havant. The site is subject to a hybrid planning application with 'Phase 1' comprising a full planning application for the erection of 130 dwellings and an outline planning application for up to 650 dwellings, community and nursery facility (use class D1 and D2), retail unit (use class a1), public open space, landscaping, diversion of public right of way and associated works and infrastructure. The site location is demonstrated in **Figure 1**, with the site layout included in **Appendix A**.



Figure 1: Site Location

- 1.2 The site (UE70) was identified in the Strategic Housing Land Availability Assessment (2017) as having potential for development. The site was identified as suitable for accommodating approximately 560 dwellings.
- 1.3 The site has also been identified in Havant Borough Council's (HBC) Draft Local Plan (2036) which was out for public consultation between 8th January to 16th February 2018. The site is identified as Policy H41: Land east of College Road with policy stating that both a Travel Plan and Transport Assessment should be submitted to support an application.
- 1.4 A number of site visits have been undertaken to review the existing situation and identify any constraints, opportunities and site accessibility observations in relation to the highway network and local facilities.

- 1.5 The scope of the highways input required for this application has been discussed at length with Hampshire County Council (HCC) and HBC highway officers. An initial pre-application meeting was held in October 2016 for a development comprising 600 dwellings, sports pitches and a convenience store for which the principles of development were agreed. More specifically, the initial pre-application discussions agreed the following;
- Vehicular Trip Rates: Based on both a TRICS assessment and comparison with a similar development to the south of the site (Forty Acre Farm);
 - Convenience Store Trip Rates: A 30% reduction in trips was proposed due to linked trips; and
 - Scope of Capacity Modelling: Including distribution of development trips onto the local road network and associated junctions requiring assessment.
- 1.6 A further pre-application was undertaken on 28th February 2018 to reflect the increase in unit numbers to 735. A Pre-application Scoping Note (PSN) was submitted to the Council ahead of the meeting, which sought to agree the following:
- Site accessibility and extent of improvements required – Subject to undertaking a Non-Motorised User audit report, identifying opportunities to improve pedestrian facilities on College Road and Scratchface Lane;
 - Development proposals;
 - Trip Rates and distributions – As agreed as part of the previous pre-application stage, however up to date information required for sports pitches;
 - Scope of junction capacity assessment including committed developments – The scope of junction assessment was agreed, and it was confirmed after the pre-application meeting that no further committed development needs to be taken into consideration; and
 - Results of junction capacity assessment and proposed mitigation measures – Comments were to be provided by ITS following the meeting with regards to required alterations to models and are reflected in the subsequent modelling section in this report.
- 1.7 Given that the principles of development have not changed from the initial pre-application discussion, merely the scale of development increased due to the rise in unit numbers, the principles of the previous scheme have been applied and referred to where appropriate throughout this report.
- 1.8 The scope of this TA therefore reviews existing site conditions and site accessibility, Personal Injury Accident (PIA) data, the proposed accommodation schedule, parking requirements, visibility and access arrangements, servicing, trip generation and capacity assessment on the local road network and makes recommendations for mitigation strategies.

- 1.9 A separate Travel Plan (TP) has been prepared in conjunction with this TA (document reference: 048.0010/TP/2), which seeks to facilitate and promote the use of sustainable transport modes, by providing a package of soft measures, supported by investment in 'hard' infrastructure. The TP will also include a detailed Action Plan and modal share targets, based on HCC's Travel Plan guidance.

2. EXISTING CONDITIONS

Site and Surroundings

- 2.1 The proposed site use is currently greenfield land and is located approximately 3.5km south of Waterlooville Town Centre and c.4km west of Havant. The site is bordered by South Downs College to the north, the A3(M) to the east, Portsmouth Golf Course and Portsdown Hill Road to the south and College Road (from which access is proposed) and residential dwellings to the west. The site and its surroundings are demonstrated in **Figure 2**.



Figure 2: Site Context (Source: Google)

Local Road Network

College Road

- 2.2 College Road is a single carriageway road, approximately 7m in width and connects to Portsdown Hill Road (as Crookhorn Lane) to the south and Purbrook Way to the north. College Road is subject to a 40mph speed limit across the site frontage, before reducing to a 30mph limit approximately 100m north of the site. Parking restrictions are in place along College Road (from approximately 260m south of the proposed site access to Purbrook Way) in the form of double yellow lines.
- 2.3 A footway, c.1.8m in width, flanks the eastern side of the College Road carriageway. Additional shared footway/cycleways are provided along the western edge from the junction with Crookhorn Lane to the south and from Apollo Drive to the north. The existing conditions along College Road are demonstrated in **Photograph 1**.



Photograph 1: Existing College Road Conditions

- 2.4 An Automated Traffic Count (ATC) survey was undertaken on College Road between 11th October and 19th October 2016 which demonstrated 85th percentile speeds of 38.4mph (NB) and 38.9mph (SB) and 5-day average northbound/southbound traffic volumes of 1,867 and 2,353 respectively over a 24hr period. The accuracy and robustness of the data used is considered suitable for the site, despite being 2 years old given that nothing has changed on the network in the local area, large scale developments such as West of Waterloo is included in TEMPRO (discussed in **Section 6**) and no further development has come forward on College Road. The ATC outputs are included as **Appendix B** with the flows assessed in subsequent chapters of this TA.

Atlantis Avenue

- 2.5 Atlantis Avenue, which runs parallel to College Road, measures approximately 5.5m in width and is subject to a 30mph speed limit. Atlantis Avenue is separated from College Road by a row of dense vegetation, through which informal crossing points are currently located. Atlantis Avenue provides a footway along the western edge of the carriageway, from which pedestrian access to Crookhorn Village can be achieved. The existing conditions along Atlantis Avenue are demonstrated in **Photograph 2**.



Photograph 2: Atlantis Avenue Existing Conditions

Crookhorn Lane

- 2.6 Crookhorn Lane, situated to the west of the development site is a single carriageway road approximately 6m in width, and connects to College Road via a simple T-junction to the south and to Stakes Hill Road/ Stakes Road and Purbrook Way via a roundabout, to the north. Crookhorn Lane is subject to a 30mph speed limit for its entire duration and provides access to local facilities including schools and a convenience store. The existing conditions along Crookhorn Lane are demonstrated in **Photograph 3**.



Photograph 3: Crookhorn Lane Existing Conditions

Purbrook Way

- 2.7 Purbrook Way, located approximately 500m to the north of the site, provides a key commuter route to the A3(M). Purbrook Way connects to the Stakes Hill Road/ Stakes Road/ Crookhorn Lane roundabout to the west and to the A3(M) Junction 4 on and off slips to the east. The road is subject to a 30mph speed limit for approximately 170m eastbound, before becoming subject to a 40mph limit c.215m west of the junction with College Road.

Wider Road Network

- 2.8 The site lies parallel to the A3(M) which connects Portsmouth in the south to London in the north. Junction 4 is situated less than 1km from the site and therefore provides access to the wider road network within a few minutes. The M27, which connects Portsmouth and Southampton, and the A27, which connects Wiltshire to East Sussex, are also located within the vicinity of the site. The wider site location is demonstrated in **Figure 3**.



Figure 3: Wider Site Location

Personal Injury Accident Data

- 2.9 Personal Injury Accident (PIA) data has been assessed to consider the existing safety situation on the local road network. Patterns displayed in the data can be assessed with regards to the proximity, frequency and severity of incidents that have occurred that may require further in-depth consideration. At the pre-application stage, the scope of the PIA assessment was agreed, and therefore the covers the following area;

- College Road;
- Crookhorn Lane (from where it becomes College Road to the junction with Portsdown Hill Road)
- Purbrook Way (between Stakes Road Roundabout to the west and the ASDA roundabout to the west).

2.10 The PIA data has been obtained from Hampshire Constabulary for the period between April 2014 and March 2019. The full PIA data is included in **Appendix C**.

2.11 Whilst the PIA data identifies that there has been a total of 47 PIA incidents (of which 14 were serious) within the PIA area agreed with HCC at the pre-application stage. The data indicates that only 2 accidents have occurred in the vicinity of the proposed site access.

2.12 The distribution and severity of the PIA incidents on the local road network in the vicinity of the site is demonstrated in **Figure 4**, with yellow circles representing 'slight' incidents and blue circles representing 'serious' incidents.



Figure 4: PIA Data

- 2.13 Whilst any PIA is regrettable, there does not appear to be any significant pattern in the data, other than that accidents tend to occur at junctions (as expected). When evaluating the incidents, a number had more than one cause. The majority of both 'slight' and 'serious' incidents were attributed to either failing to look properly, failure to judge others path/speed or inexperienced driver/rider.
- 2.14 Overall, the distribution, frequency and severity of incidents does not suggest a trend in the PIAs and the investigation does not indicate any specific highways concern that would worsen as a result of the development, or pose a highways safety concern for future site users.

3. LOCAL ACCESSIBILITY

- 3.1 Within a 15 minute walk of the site, located on Crookhorn Lane, facilities include a post office, convenience store, public house, pharmacy and doctor's surgery. A summary of the site's proximity to local amenities is summarised within **Table 1**, with an accessibility map, which demonstrates a comprehensive range of facilities and services, included within **Appendix D**.

Amenity	Distance	Walking Time (minutes)	Cycle Time (minutes)
Bus Stop	150m	2	1
Primary School	950m	11	3
Pharmacy	1.1km	14	4
Secondary School	1.2km	15	5
Doctors	1.2km	14	4
Convenience Store	1.2km	15	5
Post Office	1.2km	15	5
Dentist	1.7km	20	6

Table 1: Proximity to Local Amenities

- 3.2 Moreland's Primary School is situated approximately 950m west of the site access (accessed via College Road and Crookhorn Lane) and caters for pupils in Reception to Year 6. Crookhorn College, situated c.1.1km north of the site (14 minute walk) is the nearest secondary school to the site. The development site is also situated adjacent to South Downs College, and therefore the site's proximity to educational facilities provides a good opportunity to promote sustainable travel.
- 3.3 In terms of health provision, there is a doctor's surgery (Crookhorn Lane Surgery) located approximately 1.2km (14 minute walk) north of the site, adjacent to the pharmacy. The nearest dentist (Oasis Dental Care) is situated within a 20 minute walk of the site. Queen Alexandra Hospital, Portsmouth, situated 4km southwest of the site, provides the nearest Accident and Emergency facilities.

Local Pedestrian Network

College Road

- 3.4 The local footway network benefits from a gentle topography which makes it attractive for use by pedestrians. College Road benefits from a shared footway/cycleway to the north of the site, before reducing to a footway, c.1.8m in width, flanking its eastern edge past to the site access.

- 3.5 To the south of the site, where College Road becomes Crookhorn Lane, shared footway/cycleways approximately 2.5m in width flank either side of the carriageway for its duration and to the junction with Portsdown Hill Road. A pedestrian crossing point, supported by dropped kerbs and tactile paving is provided 50m south of the Crookhorn Lane/College Road junction facilitating the movements of pedestrians across College Road. An underpass is also provided in this location ensuring a safe route for all non-motorised users. The pedestrian infrastructure along Crookhorn Lane/College Road is demonstrated in **Photograph 4**.



Photograph 4: Crookhorn Lane Infrastructure

Scratchface Lane

- 3.6 At the pre-application stage, comments were made by both HBC and HCC highways officers with regards to ensuring that the development provides a continuous footway/cycleway link between College Road and Scratchface Lane. Scratchface Lane is an existing Bridleway (Havant no. 28) which connects Purbrook to the west to Bedhampton to the east. The existing conditions along Scratchface Lane is demonstrated in **Photograph 5**.



Photograph 5: Scratchface Lane Conditions

Crookhorn Lane

- 3.7 Crookhorn Lane benefits from continuous footways, approximately 1.8m in width, flanking both sides of the carriageway. Several crossing points are located along Crookhorn Lane, including a signalised crossing situated directly opposite the post office and convenience store (c.500m north of the junction with College Road). The signalised crossing is supported by dropped kerbs and tactile paving, facilitating the movement of all non-motorised users around the village, and is demonstrated in **Photograph 6**.



Photograph 6: Crookhorn Lane Signalised Crossing

- 3.8 The attractiveness and safety of the route to school and the facilities available in Crookhorn was identified by HCC at the pre-application stage as an area which requires a full assessment, and has been reviewed in the subsequent paragraphs.
- 3.9 As part of the development proposals, a Non-Motorised User (NMU) audit has been undertaken to identify possible pedestrian improvements on College Road and Scratchface Lane, with this discussed in more detail in **Section 7**.

Route to School

- 3.10 The closest primary and secondary school have been identified as Moreland's Primary School and Crookhorn College respectively. The routes to the schools are assessed subsequently, as requested by HCC at the pre-application stage.

- 3.11 The most direct route to Moreland's Primary School is via College Road and Crookhorn Lane. As previously outlined, College Road benefits from a 1.8m wide footway flanking the eastern side of the carriageway, with a pedestrian crossing point provided 50m south of the junction with Crookhorn Lane supported by dropped kerbs and tactile paving. A footway flanks the western side of Crookhorn Lane between the junction with College Road to the school, therefore providing a safe and continuous route between the site and the school.
- 3.12 Alternatively, another potential route to Moreland's Primary School is via Atlantis Avenue and the estate roads between Atlantis Avenue and Crookhorn Lane. Circa 150m north of the proposed site access a crossing point is provided across College Road which allows connection to a footway on the western side of the carriageway. This footway connects onto Apollo Drive and in turn Atlantis Avenue, with footways provided throughout the residential estate between Atlantis Avenue and Crookhorn Lane.
- 3.13 Outside the entrance to the school itself, a pedestrian crossing point, supported by dropped kerbs and tactile paving is provided, facilitating the movements of pedestrians in this location as demonstrated in **Photograph 7**.



Photograph 7: Pedestrian Crossing outside Moreland's School

- 3.14 Crookhorn College, situated 1.2km north of the site and accessible via a 15 minute walk or 5 minute cycle, has been identified as the closest secondary school. The primary route to Crookhorn College is via College Road, Purbrook Way and Stakes Hill Road. College Road is flanked by a 1.8m wide footway along the eastern side of the carriageway, before becoming a shared footway/cycleway approximately 55m north of the South Downs College junction. Two pedestrian crossing points are provided along the northern section of College Road, facilitating the movements of all non-motorised site users in this location.
- 3.15 Purbrook Way benefits from footways flanking both sides of the carriageway. As part of a residential development at West of Waterloo (application reference: 10/02862/OUT), improvements are to be made to Purbrook Way between the junction with the A3(M) and Stakes Hill Road. These improvements will be further detailed later in this report, but pedestrian provision will be maintained and improved. Footways will continue to flank either side of the carriageway. With the existing Stakes Road/Stakes Hill Road/Purbrook Way/Crookhorn Lane roundabout to become signalised, pedestrian movements across the junction will be made safer and easier.
- 3.16 Stakes Hill Road is flanked by 2m wide footways along both sides of the carriageway. A grass verge separates the footway from the Stakes Hill Road carriageway further enhancing the pedestrian environment and making the area safe for students and parents alike.

Public Rights of Way

- 3.17 The site is also well placed in relation to Public Right of Ways (PRoWs), with a number of routes located in the vicinity of the site. Route 28 passes across the northern border of the site and connects to College Road and Purbrook Way. The Public Rights of Way are demonstrated in **Figure 5**.

- 3.21 College Road is considered acceptable for cycling, particularly given that no PIA incidents that occurred between the shared footway/cycleways to the north and south of the site involved cyclists. In addition, College Road is flanked by a footway on the eastern side, separated from the carriageway via a grass verge, providing a space for pedestrians to use when cyclists are passing. As part of the proposed development, an internal footway/cycleway will be provided parallel to the College Road carriageway providing a safer cycling environment in this location and therefore only a section approximately 450m in length is not provided as a shared footway/cycleway.
- 3.22 The internal footway/cycleway will also run east to west through the site connecting Scratchface Lane to the east to College Road to the west, thus providing and enhancing the existing links for the local area. The internal footway/cycleway is demonstrated on the site layout, included in **Appendix A**.
- 3.23 Further afield, National Cycle Network (NCN) Route 222, which connects Southsea to the south to the South Downs to the north, runs to the west of the development site on Crookhorn Lane. The local cycle routes in the vicinity of the site are demonstrated in **Figure 6**.



Figure : Local Cycle Routes (Source: Havant Borough Cycle Network 2017)

- 3.24 For a local cycle, a journey into Havant takes approximately 13 minutes, whilst a journey into Portsmouth takes approximately 35 minutes, via NCN 2.

Bus Services

- 3.25 The site is supported by northbound and southbound bus stops on College Road, approximately 150m north of the site. Both bus stops benefit from a shelter with seating and a detailed timetable. An additional set of bus stops are provided approximately 450m south of the proposed internal footway/cycleway, both of which benefit from a single pole and timetable. A summary of the bus services that operate from these stops is provided within **Table 2**.

Service	Route	Frequency		
		Monday – Friday	Saturday	Sunday & Bank Holidays
37	Havant – Waterloo – Horndean – Petersfield	Hourly	Hourly	No Service
39	Havant – Leigh Park – Bedhampton – Waterloo – Wecock Farm	Every 10 minutes	Every 15 minutes	Hourly
737*	Havant and South Downs College – Bordon	Arrives – 08:50 and 10:50 Departs – 14:55 and 17:00	No Service	No Service
7C*	South Downs College – Cosham – The Hard, Portsmouth	Arrives - 08:42 Departs - 15:35	No Service	No Service
21	Havant – Leigh Park – Farlington – Portsmouth	Every 10 minutes	Every 10 minutes	Every 10 minutes
654*	Southdowns College – Waterloo – Denmead – Hambledon	Arrives – 08:49 Departs – 17:15	No Service	No Service
SD4*	Portchester – Wickham – Cosham – South Downs Campus – Bishops Waltham	Arrives – 08:35 Departs – 17:05	No Service	No Service
SD5*	Havant Campus – Fareham – Bridgemary – Gosport – South Downs Campus – Cosham – Portchester – Fareham Rail Station	Arrives – 08:50 Departs – 17:42	No Service	No Service
SD7*	South Downs College – Fratton – Eastney - Southsea	Arrives – 08:35	No Service	No Service

Table 2: Local Bus Services: College Road
*school service

- 3.26 The 39 service provides a regular service to Havant and Wecock Farm 7 days a week. A typical journey to Havant takes approximately 15 minutes, whilst a journey to Wecock Farm takes approximately 20 minutes.
- 3.27 Additional bus services operate from Crookhorn Lane, 10 minute walk from the site, providing frequent services to destinations including Queen Alexandra Hospital (half hourly) and Portsmouth City Centre (every 10/15 minutes). A journey to Portsmouth takes approximately 35 minutes. A summary of the bus services available from these bus stops are summarised in **Table 3**.

Service	Route	Frequency		
		Monday – Friday	Saturday	Sunday & Bank Holidays
20	Portsmouth, Cosham, QA Hospital, Havant	Every 30 minutes	Every 30 minutes	No Service
37	Havant – Waterloo – Horndean – Petersfield	Hourly	Hourly	No Service
39	Havant – Leigh Park – Bedhampton – Waterloo – Wecock Farm	Every 10 minutes	Every 15 minutes	Hourly
The Star 7	Southsea, City Centre, Cosham, Waterloo, Wecock Farm	Every 10-15 minutes	Every 15 minutes	Every 20 minutes

Table 3: Local Bus Services: Crookhorn Lane

Rail Services

- 3.28 Bedhampton Railway Station is located approximately 3km (9 minute cycle) east of the development site. The station is also accessible by a short walk-bus-walk journey from the site, via bus service 37.
- 3.29 The station is equipped with 20 cycle storage spaces, a manned ticket office Monday - Saturday, customer help points and CCTV.
- 3.30 Bedhampton Railway Station provides direct access to destinations including Portsmouth and Southsea, Littlehampton and London Waterloo. Trains typically operate at a frequency of 3 per hour for services to Portsmouth, with journeys taking approximately 13 minutes. Services to Littlehampton and London Waterloo typically operate hourly, with journeys taking approximately 40 and 90 minutes respectively.
- 3.31 In addition, Havant Railway Station is accessible via a 15 minute cycle from the site. Havant station provides a more comprehensive range of facilities and serves a greater number of destinations. Destinations available from Havant include Brighton and London Victoria.

Summary of Local Accessibility

- 3.32 The proposed site is situated within a very accessible and sustainable location, given that it is within a 15 minute walk of a comprehensive range of facilities and amenities including the local schools. The site therefore presents an excellent opportunity to encourage the use of the local walking/cycling infrastructure for local trips and the comprehensive bus service for journeys further afield, and thus create a sustainable development.
- 3.33 The gentle topography experienced within the area, coupled with suitably wide footways flanking all major desire lines in the area makes walking a suitable alternative to the private car. Pedestrian crossing points are provided along College Road, however additional crossing points have been assessed with a particular focus on crossing College Road and access through to Atlantis Avenue.
- 3.34 The existing cycle infrastructure is considered suitable to accommodate additional cyclists generated by

the site, given the wide carriageway outside the site access. Shared footway/cycleways are provided both to the north and south of the site providing a continuous route between the site and the wider cycle network.

- 3.35 A number of bus stops are located in the vicinity of the site serving a wide range of destinations with the no.39 bus service providing the most frequent service.
- 3.36 Bedhampton Railway Station is accessible via a 9 minute cycle or short walk-bus-walk journey from the site. The station provides direct services to Portsmouth, Littlehampton and London Waterloo.

4. PLANNING POLICY

National Planning Policy

- 4.1 The revised National Planning Policy Framework (NPPF) was adopted in February 2019 and acts as the central guidance for development planning, replacing all National Planning Policy guidance. The following NPPF paragraphs are relevant to this TA:

Planning policies and decisions should recognise that sites to meet local business and community needs in rural areas may have to be found adjacent to or beyond existing settlements, and in locations that are not well served by public transport. In these circumstances it will be important to ensure that development is sensitive to its surroundings, does not have an unacceptable impact on local roads and exploits any opportunities to make a location more sustainable (for example by improving the scope for access on foot, by cycling or by public transport). The use of previously developed land, and sites that are physically well-related to existing settlements, should be encouraged where suitable opportunities exist.

(NPPF Para. 84)

Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

- a) The potential impacts of development on transport networks can be addressed;
- b) Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised.
- c) Opportunities to promote walking, cycling and public transport use are identified and pursued;
- d) The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and
- e) Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places.

(NPPF Para. 102)

Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.

(NPPF Para. 103)

Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

(NPPF Para. 109)

All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.

(NPPF Para. 111)

Regional and Local Policy

Hampshire County Council's Local Transport Plan 3 (2011-2031)

- 4.2 LTP3 sets out HCCs transport strategy and identifies a range of policy objectives, based on the three guiding principles of "Reduce, Manage and Invest". The most relevant policy objectives to this TA are summarised below:

Policy Objective 4: Work with bus and coach operators to grow bus travel, seek to remove barriers that prevent some people using buses where affordable and practical, and reduce dependence on the private car for journeys on inter- and intra-urban corridors;

Policy Objective 11: Reduce the need to travel through encouragement of a high-speed broadband network, supporting the local delivery of services and in urban areas the application of 'Smarter Choices' initiatives;

Policy Objective 12: Invest in sustainable transport measures, including walking and cycling infrastructure, principally in urban areas, to provide a healthy alternative to the car for local short journeys to work, local services or schools; and work with health authorities to ensure that transport policy supports local ambitions for health and well-being.

Havant Borough Council Core Strategy (2011)

- 4.3 The Core Strategy is implemented to help guide the development of the borough by outlining the long-term vision and the aims and objectives. The Core Strategy aim most relevant to this TA is *'the borough's residents expect high quality public services and the vision includes an aspiration to provide better coordinated and joined up services'*.
- 4.4 The Core Strategy also identifies a policy specific to Transport and Access to which developments within the borough follow and adhere to wherever possible. This policy (PCS20) is outlined below;

Policy CS20: Development will be permitted that:

- Is consistent with and contributes to the implementation of the HCC 'Reduce, Manage and invest' Strategy;
- 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 response 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, especially high quality/ frequency uses and includes walking and cycling where appropriate; and
- Improves highway, cycling and pedestrian's links

Site Status and “Committed Schemes”

- 4.8 The site (UE70) was identified in the Strategic Housing Local Availability Assessment (January 2017) as having potential for development. The site was identified as suitable for accommodating a mixed-use development comprising approximately 560 dwellings.
- 4.9 The site has also been identified in Havant Borough Council’s Draft Local Plan (2036) which was out for public consultation between 8th January to 16th February 2018. The site is identified as Policy H41: Land east of College Road with policy stating that a Travel Plan and Transport Assessment should be submitted to support an application.
- 4.10 Through the Pre-Application discussions with HCC it was agreed that no further developments need to be included as ‘Committed Development’ for the purposes of the junction capacity assessment.

Public Consultation and Development Consultation Forum

- 4.11 This TA has also been informed by feedback from a Public Consultation event held at the Phoenix Community Centre in May 2018 and a Development Consultation Forum (DCF) held at Havant Borough Council offices in February 2018.

5. DEVELOPMENT PROPOSALS

- 5.1 The site is subject to a hybrid planning application with a full application submitted for Phase 1 of the development and an outline application submitted for the remainder of the site. The accommodation schedule for Phase 1 is discussed subsequently, however the remainder of the site is due to comprise a mixture of both 1, 2, 3 and 4 bedroom properties and will be assessed further through a Reserved Matters application.

Phase 1

- 5.2 Phase 1 of the development comprises 130 dwellings with associated car parking. The proposed accommodation schedule is summarised in **Table 4**, with the site layout included in **Appendix A**.

Type of Dwelling	Private	Affordable	Total
2 Bedrooms	26	32	58
3 Bedrooms	45	7	52
4 Bedrooms	20	-	20
Total	91	39	130

Table 4: Phase 1 Accommodation Schedule

Car Parking Provision

- 5.3 Car parking for Phase 1 has been provided in accordance with Havant Borough Council's (HBC) Parking Supplementary Planning Document (SPD) (2016), with the remainder of the site to conform to the standards set out below. The SPD sets out the minimum parking standards for a residential development. The car parking standards and required parking provision for Phase 1 is summarised in **Table 5**.

Size of Dwelling	Number of Units	Minimum Car Parking Requirement (Allocated)	Number of Spaces Required	Minimum Car Parking Requirement (Unallocated)	Number of Spaces Required
1 Bedroom	-	1 space	-	0.9 spaces	-
2 Bedrooms	58	2 spaces	116	1.3 spaces	75
3 Bedrooms	52	2 spaces	104	1.9 spaces	99
4+ Bedrooms	20	3 spaces	30	2.4 spaces	48
Total	130	-	250	-	222

Table 5: Phase 1 Required Parking Provision

- 5.4 A total of 222 (unallocated) – 250 (allocated) parking spaces are required to serve the residential aspect of the development. An additional 20% of unallocated parking spaces are required for visitors and is to be provided evenly across the site.
- 5.5 The proposed parking strategy for the site uses a combination of garages, driveways and laybys. A total of 248 residential car parking spaces are provided with a further 24 spaces provided for visitors. The

proposed parking strategy therefore accords with the standards. The location of the visitor car parking spaces is shown on the site layout included in **Appendix A**.

Internal Road Layout

- 5.6 The parameters of the site layout are designed to create an attractive and permeable pedestrian and cycle environment. The site's spine road will measure 5.5m in width, after which carriageways narrow and become more reflective of Manual for Streets (MfS) design principles. A carriageway width of 4.8m is sufficient in accommodating a car and a larger vehicle to pass simultaneously and 4.1m is sufficient for two cars to pass. To summarise, the design principles on which the scheme is based are;
- Spine road to measure 5.5m in width, before narrowing to 4.1m – 4.8m upon entry to cul-de-sacs, or 6m wide shared surfaces; and
 - 2m wide footway flanking the western side of the carriageway;
 - Shared footway/cycleway around the perimeter of the site.
- 5.7 In accordance with MfS design guidance, all bends and junctions within the home zones would be designed to achieve the required forward visibility for vehicles travelling up to 20mph. In addition, where junctions adjoin to the spine road, visibility splays have been provided in accordance with a 30mph speed limit, thus measuring 2.4m x 43m.
- 5.8 Any planting provided within the visibility envelope would be maintained to below 600mm in height. Internal visibility splays have been assessed and are included in **Appendix E**.

Servicing Arrangements

- 5.9 Servicing would take place internally within the site boundary in order to reduce the impact on the local road network. In accordance with MfS guidance (paragraph 6.8.9) no resident would be required to carry their bins greater than 30m to a collection point or kerb edge, with the refuse vehicle able to get within 25m of each property or bin collection point. Swept path analysis has been undertaken to ensure that refuse vehicles can enter, turn and exit on-site and is included in **Appendix F**.
- 5.10 Fire tender vehicles can get within 45m of all dwellings in accordance with Building Regulations Part M. Swept path analysis of the site has also been undertaken to ensure that fire tenders can enter, turn and exit on-site and is included in **Appendix G**.

6. TRAFFIC IMPACT ASSESSMENT, TRIP DISTRIBUTION AND ROUTE ASSIGNMENT

6.1 This section of the TA assesses the likely vehicular and pedestrian trip generation associated with the proposed development. The trip rates agreed as part of the 2016 pre-application discussions were considered to be suitable for continued use at the latest pre-application discussions given that no principles of the development have changed, other than an increase in unit numbers.

Residential Trip Generation

6.2 At the pre-application stage, HCC agreed to the residential trip rates for the site. The parameters used to calculate the trip generation are as follows;

- TRICS (v.7.3.2) database;
- 'Residential', 'Houses Privately Owned' Use Class;
- Sites in South East and South West regions only;
- Weekday surveys only;
- 100 – 1000 units; and
- 'Suburban' and 'Edge of Town'

6.3 The trip rates are also considered to represent a worst-case scenario as the development would incorporate a mix of private dwellings as well as both flats and affordable properties, which would typically exhibit lower trip rates.

6.4 The agreed trip rates are summarised in **Table 6**, with the outputs included in **Appendix H**.

TRICS (v.7.3.2)	AM Peak Period (0800 – 0900)		PM Peak Period (1700 – 1800)		Total Daily Trips
	Arrivals	Departures	Arrivals	Departures	
Trip Rate per Dwelling	0.149	0.385	0.371	0.218	4.971
Trip Generation - 790	118	304	293	172	3,927

Table 6: Proposed Vehicular Trip Generation

6.5 **Table 6** demonstrates that the residential aspect of the development would generate 422 vehicle trips in the AM peak period, 465 vehicle trips in the PM peak period and 3,927 vehicle trips across a 12 hour day. As the existing site is currently greenfield, the proposed development's trips are all additional to the local highway network. The impact of the development on the operation of the local road network is assessed later in the report.

Pedestrian Trip Generation

- 6.6 The number of pedestrian movements anticipated to be generated by the residential aspect of the proposed development has also been calculated. The parameters used are the same as those for the residential vehicular trip rates, however the latest TRICS database has been used. The results of the pedestrian trip generation assessment are summarised in **Table 7**.

TRICS (v.7.5.1)	AM Peak Period (0800 – 0900)		PM Peak Period (1700 – 1800)		Total Daily Trips
	Arrivals	Departures	Arrivals	Departures	
Pedestrian Trip Rate per Dwelling	0.028	0.080	0.064	0.027	1.019
Pedestrian Trip Generation - 790 dwellings	22	63	51	21	805

Table 7: Proposed Pedestrian Trip Generation

- 6.7 **Table 7** demonstrates that the residential aspect of the development would generate 85 pedestrian trips in the AM peak period, 72 pedestrian trips in the PM peak period and 805 pedestrian trips across a 12 hour day.
- 6.8 The existing pedestrian infrastructure, coupled with the proposed improvements along College Road and the addition of the shared footway/cycleway within the site, is considered acceptable to accommodate the anticipated number of pedestrian movements generated by the site.

Trip Distribution

- 6.9 To identify how additional traffic generated by the site would distribute onto the local highway network, 2011 Census data for 'Location of Usual Residence and Place of Work' (reference: WF01BEW) has been assessed for the local Purbrook/Widley mid layer (reference: EO2004772: Havant 011).
- 6.10 Given its proximity, it is anticipated that a large proportion of trips to destinations to the south and west of the site would utilise the A3(M) (i.e. turning north out of the site) rather than heading directly to their destination on more local roads (i.e. turning south out of the site). This north-south split is considered in order to maintain a robust assessment scenario on key local junctions.
- 6.11 The trip distributions, which have been agreed with HCC at the pre-application stage, are summarised in **Table 8**, with the full census data outputs included in **Appendix J**.

Destination	Percentage	North/South split at site access	Percentage North	Percentage South
Portsmouth	35%	70/30	25%	10%
Southampton	4%	North Only	4%	0%
East Hampshire	5%	North Only	5%	0%
Fareham	5%	70/30	4%	1%
Gosport	2%	70/30	1%	1%
Waterlooville	12%	North Only	12%	0%
West Leigh	2%	North Only	2%	0%
North Havant	1%	North Only	1%	0%
Widley	7%	North Only	7%	0%
Emsworth	1%	South Only	0%	1%
Havant	9%	50/50	5%	4%
Hayling Island	1%	South Only	0%	1%
Winchester	5%	North Only	5%	0%
Surrey	1%	North Only	1%	0%
Sussex	5%	North Only	1%	0%
Bedhampton	3%	South Only	0%	3%
Cowplain	1%	North Only	1%	0%
London	1%	North Only	1%	0%

Table 8: Agreed Trip Distributions

6.12 **Table 9** summarises each route by percentage of residents expected to use each route.

Direction from Site Access	Route	Percentage of Traffic
South	Portsdown Hill Road (WB)	12%
	Portsdown Hill Road (EB)/ Bedhampton Road	9%
North	Stakes Road	7%
	Stakes Hill Road	13%
	A3(M) SB	44%
	Hulbert Road/A3(M) NB	7%
	Purbrook Way (EB)	8%
Total	-	100%

Table 9: Route Assignment

6.13 The distribution of development traffic on the local road network is assessed in the following figures, with the full distribution on the local road network demonstrated in **Appendix K**.

Site Access

6.14 **Figure 7** demonstrates that 79% of development traffic is predicted to travel northbound on College Road, with 21% travelling southbound.

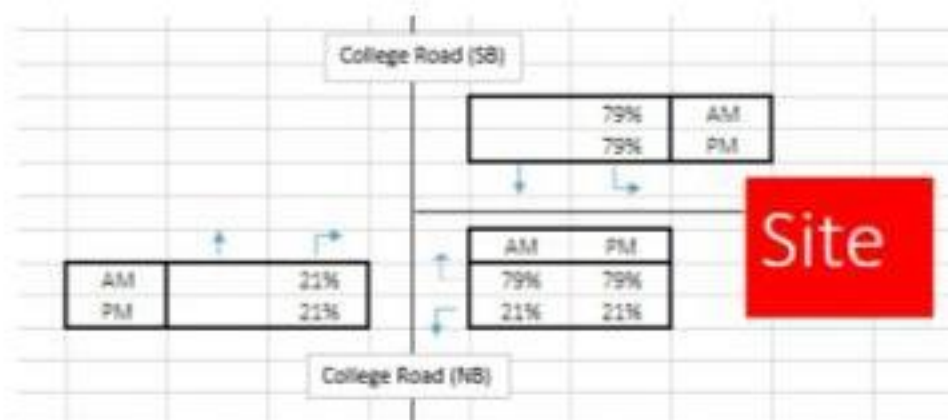


Figure 7: Trip Distribution from Site Access

Northbound Traffic

College Road/ Purbrook Way

6.15 College Road/ Purbrook Way is a signalised junction, located approximately 500m north of the development site, which will be improved as part of the West of Waterlooville development scheme (*application reference: 10/02862/OUT*).

6.16 It is predicted that, of the 79% of development traffic travelling northbound on College Road, 59% will turn right at the junction and travel eastbound along Purbrook Way towards the A3(M), with the remaining 20% travelling westbound along Purbrook Way towards Purbrook and Waterlooville, as demonstrated in **Figure 8**.

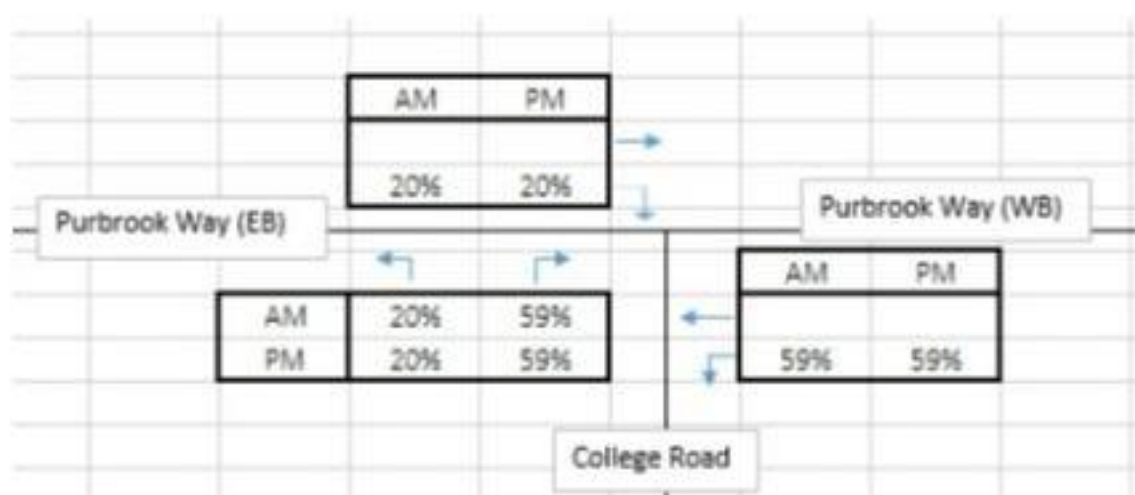


Figure 8: Trip Distribution at College Road/ Purbrook Way Junction

College Road/ Purbrook Way/ Stakes Hill Road Roundabout

6.17 The 'Stakes Hill Road' roundabout is a four-arm roundabout, c.900m north west of the development site, and links Purbrook Way to the east to Stakes Road in the west. Stakes Hill Road is the northern arm on the roundabout and provides direct access to Crookhorn College and Waterlooville Town Centre. The southern arm (Crookhorn Lane) provides access to local facilities and amenities including a pharmacy and convenience store. As part of the development at West of Waterlooville, this junction is to become signalised, as discussed later in the report.

6.18 At the Purbrook Way/ Stakes Hill Road/ Crookhorn Lane roundabout, it is anticipated that of the 20% of development traffic, 7% will continue straight and head towards Purbrook, whilst 13% will travel north onto Stakes Hill Road which passes Crookhorn College and provides a route to Waterlooville town centre. This is demonstrated in **Figure 9**.

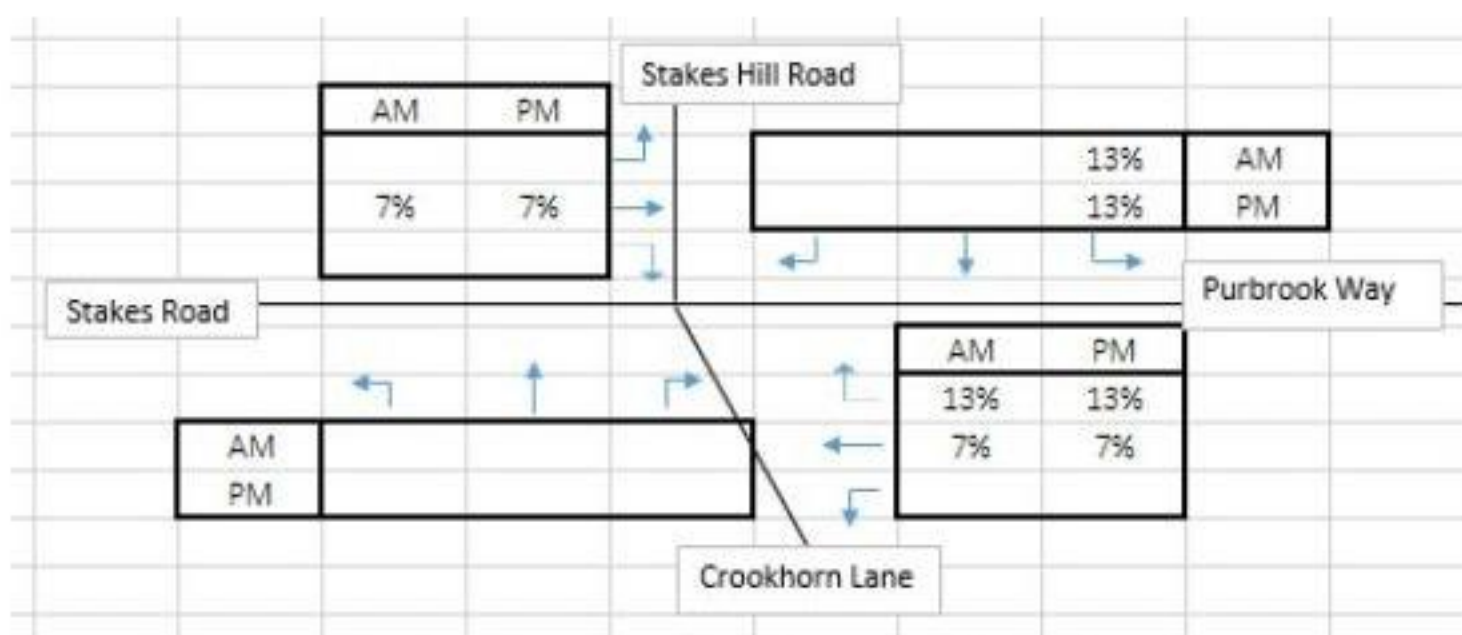


Figure 9: Trip Distribution at Purbrook Way/ Stakes Hill Road/ Crookhorn Lane Roundabout

6.19 As part of the 2016 pre-application discussions, comments were raised by Highways England in relation to the anticipated percentage of vehicles using Stakes Hill Road to access Junction 3 of the A3. An extensive analysis has been undertaken to determine the likely distributions from the site based on substantial local knowledge, discussions with the local authority and site-specific journey to work census data.

6.20 Stakes Hill Road is a predominantly residential route that provides access to local schools and a substantial number of properties. The road is subject to a number of traffic calming measures, including pinch points and pedestrian crossing points, which would reduce the speed of through traffic and make this a less attractive route for those wanting to access the A3. In comparison, Purbrook Way/Hulbert Road provide a more direct, free flowing and convenient route to the A3(M) therefore providing a far more favourable route.

6.21 In addition, Highways England did not provide any evidence to suggest that the trip distributions from the site should be any different from those provided. It was therefore agreed with HCC highway officers at the pre-application stage that the original distributions are reflective of likely behaviour at the site.

A3(M) Junction 4 on-slip and off-slip

6.22 The Junction 4 on-slip and off-slip roundabouts, located approximately 850m northeast of the site, form dumbbell roundabouts linking Bedhampton and Purbrook. The on-slip provides southbound access on to the A3(M) to Portsmouth, whilst the off-slip provides access to Purbrook and Waterlooville. Crossing points, supported by dropped kerbs, are situated on the roundabouts. In addition, footways c.3m wide flank the carriageway as it passes over the A3(M).

6.23 **Figure 10** demonstrates that, of the 59% of development traffic heading east along Purbrook Way, 15% is expected to continue straight over both roundabouts and head towards Havant. The remaining 44% are anticipated to continue over the first roundabout before heading right at the second and entering the A3(M) southbound carriageway.

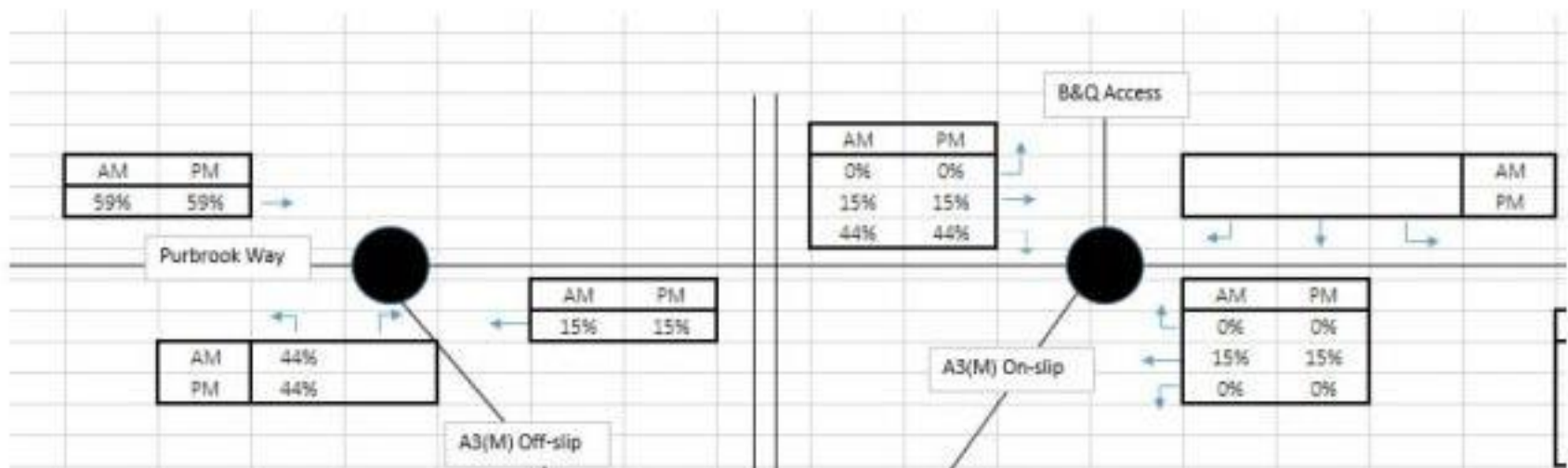


Figure 10: Trip Distribution at A3(M) Junction 4 on-slip and off-slip

ASDA Roundabout

6.24 Situated approximately 1.6km north east of the site, the ASDA roundabout provides access to an ASDA superstore, employment space and a commuter route through to Bedhampton and Havant. The roundabout has recently been upgraded to a five-arm, signalised roundabout with each arm comprising a minimum of two entry lanes. Pedestrian crossing points are provided and are complete with tactile paving and dropped kerbs.

6.25 **Figure 11** demonstrates that of the 15% continuing straight across the A3(M) roundabouts, 7% will turn left at the ASDA roundabout and head towards Junction 3. The remaining 8% are predicted to continue straight along Purbrook Way and head towards Havant.

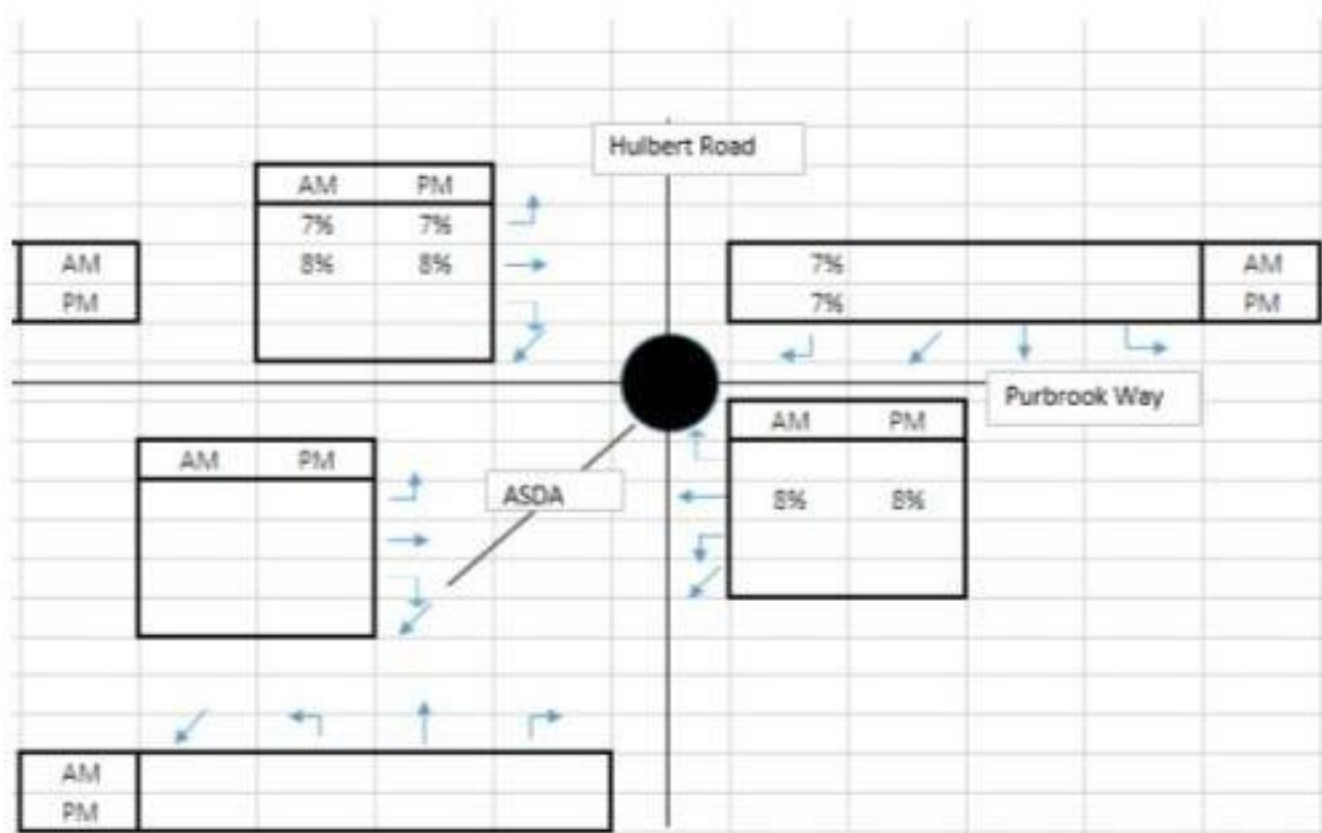


Figure 11: Trip Distribution at the ASDA Roundabout

Southbound Traffic

Crookhorn Lane/ Portsdown Hill Road

- 6.26 Crookhorn Lane/ Portsdown Hill Road is a priority junction located approximately 1.2km south of the site access. Crookhorn Lane is approximately 7m in width, with a 2m wide footway flanking both sides of the carriageway. A pedestrian refuge island is situated at the junction and is supported by tactile paving and dropped kerbs, facilitating the movements of all non-motorised users in this area. A right-turn lane is provided on Portsdown Hill Road for those waiting to travel onto Crookhorn Lane.
- 6.27 **Figure 12** demonstrates that 12% of southbound traffic is expected to travel westbound along Portsdown Hill Road, heading towards Cosham. The remaining 9% are expected to travel eastbound on Portsdown Hill Road towards Bedhampton.

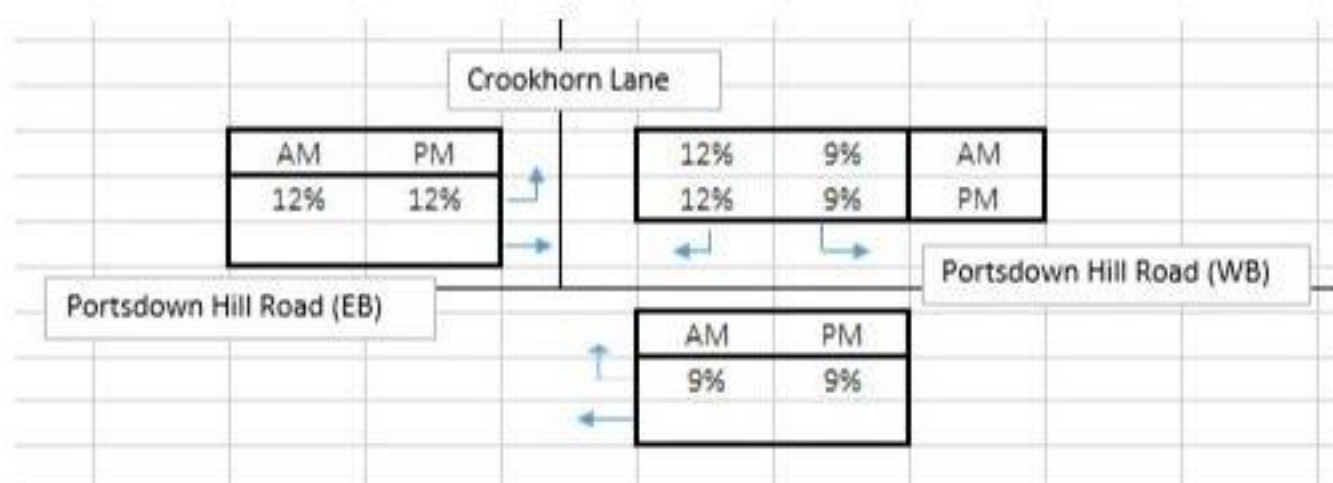


Figure 12: Trip Distribution at Crookhorn Lane/ Portsdown Hill Road Junction

Traffic Surveys

6.28 In order to establish the baseline traffic flows on the local road network, Automated Traffic Count (ATC) surveys were undertaken on College Road (October 2016) as demonstrated in **Table 21 (Section 7)**. In addition, turning count surveys were undertaken on 13th October 2016 at the following junctions in accordance with pre-application feedback.

- Crookhorn Lane/Portsmouth Hill Road;
- Bedhampton Hill/Portsmouth Hill Road/Bedhampton Hill Road;
- College Road/Purbrook Way;
- Stakes Hill Road/Stakes Hill Road/Purbrook Way/Crookhorn Lane;
- A3(M) Off slip/Purbrook Way; and
- A3(M) On slip/ Purbrook Way/B&Q

6.29 A summary of the flow data is demonstrated in **Tables 10 to 15**, with the full outputs included in **Appendix B**.

Crookhorn Lane/ Portsmouth Hill Road				
	Portsmouth Hill Road (EB)	Crookhorn Lane	Portsmouth Hill Road (WB)	Total
AM Peak				
Flows	692	404	757	1,853
PM Peak				
Flows	772	296	596	1,664

Table 10: Crookhorn Lane/Portsmouth Hill Road Turning Count Data

Bedhampton Hill/Portsmouth Hill Road/ Bedhampton Hill Road					
	Portsmouth Hill Road	Maylands Avenue	Bedhampton Road	Bedhampton Hill	Total
AM Peak					
Flows	442	117	999	535	2,093
PM Peak					
Flows	485	67	1,006	678	2,236

Table 11: Bedhampton Hill/Portsmouth Hill Road/Bedhampton Hill Road Turning Count Data

College Road/ Purbrook Way				
	Purbrook Way (EB)	College Road	Purbrook Way (WB)	Total
AM Peak				
Flows	1,183	216	1,112	2,511
PM Peak				
Flows	733	289	1,047	2,069

Table 12: College Road/Purbrook Way Turning Count Data

Stakes Hill Road/Stakes Road/Purbrook Way					
	Stakes Road	Stakes Hill Road	Purbrook Way	Crookhorn Lane	Total
AM Peak					
Flows	579	869	750	327	2,525
PM Peak					
Flows	474	577	951	324	2,326

Table 13: Stakes Hill Road/Stakes Road/Purbrook Way Turning Count Data

A3(M) Off slip Roundabout				
	Purbrook Way (EB)	A3(M) Off Slip	Purbrook Way (WB)	Total
AM Peak				
Flows	1,177	733	660	2,570
PM Peak				
Flows	827	1,028	541	2,396

Table 14: A3(M) Off Slip Roundabout Turning Count Data

A3(M) On slip Roundabout					
	Purbrook Way (EB)	B&Q	Purbrook Way (WB)	A3(M) On slip	Total
AM Peak					
Flows	1,466	83	1,043	-	2,592
PM Peak					
Flows	1,323	156	918	-	2,397

Table 15: A3(M) On Slip Roundabout Turning Count Data

TEMPRO Traffic Growth

6.30 As the baseline traffic survey along both College Road and at the aforementioned junctions was undertaken in 2016, a growth factor has been applied to gain a 2019 baseline which can be used to assess the operation of the local road network in the present day. In order to ascertain the growth factors, the TEMPRO 7.1 database was used with the following criteria applied:

- NTM AF15 Dataset (2010 – 2040);
- Area: Havant;
- All Journey types;
- Car Driver trips only;
- Origin / Destination trip generation; and
- NTM locally adjusted for all area and road types.

- 6.31 A period of 10 years post-application has also been assessed which refers to when the development should be fully completed and occupied. The TEMPRO growth rates are summarised in **Table 16**.

Year	TEMPRO Growth Factor	
2019	AM	1.0162
	PM	1.0153
2029	AM	1.1265
	PM	1.1234

Table 16: TEMPRO Growth Rates

Committed Development

- 6.32 The use of the TEMPRO database has identified that the development traffic generated by the West of Waterloo development is included with the growth rates provided by the software, and as such, including traffic generated by the development as committed development by another mechanism would result in an element of 'double counting'.
- 6.33 As part of the pre-application discussions HCC highway officers, it was therefore confirmed that no additional development needs to be taken into consideration for the junction capacity assessment.

7. ACCESS ARRANGEMENT

- 7.1 The proposed development would be accessed via a single point of vehicular access onto College Road, with the type of access required established using the likely trip generation for the site (as detailed in **Section 6**) and the ATC survey undertaken in 2016 along College Road. The survey was undertaken in the vicinity of the proposed site access between 11th and 19th October 2016, and the results are summarised in **Table 17**.

Direction	Traffic Flows (5-day average)			85 th %ile Speed (24 hour)
	AM Peak Period (0800 – 0900)	PM Peak Period (1600 – 1700)	24 Hour	
Northbound	243	133	1,867	38.4
Southbound	243	217	2,353	38.9

Table 17: College Road Traffic Flows

Junction Design

- 7.2 A signalised junction was agreed as the most suitable junction required to serve the development during the pre-application stage, due to the similar number of vehicles using the junction from both College Road and the development site (approximately 4,000 daily trips).
- 7.3 The signalised junction has been designed in a way that it accords with DMRB (Design Manual for Roads and Bridges) TD 42/95 junction design guidance. Both the north and southbound arms on College Road comprise a one lane approach road approximately 3.5m in width. For right turn manoeuvres into the site (anticipated 21% of traffic) a 3.5m wide right turn lane is provided and designed in accordance with a 40mph speed limit.
- 7.4 The site access arm comprises a one lane approach, 3.5m in width. A signalised crossing is provided along the site access arm which therefore provides a continuous pedestrian route along College Road. At the access a 3m wide footway/cycleway is provided which connects to the site's internal footway/cycleway, the existing footway along College Road (to the south) and the footway along the spine road. Provision has been made for large goods vehicles accessing the site, resulting in corner radii of 15m to the south and 16m to the north. The access drawing included swept path analysis is included in **Appendix L**.

Pedestrian/Emergency Access

- 7.5 A separate pedestrian access is provided to the south of the proposed signalised junction in the form of a shared footway/cycleway. An emergency access is also provided to the north of the proposed shared footway/cycleway as demonstrated on the site layout included in **Appendix A**.
- 7.6 Highway comments received at the pre-application stage requested the requirement of the site to provide a connection onto Scratchface Lane. As part of the proposed development a shared footway/cycleway would be provided on-site running east to west, thus ensuring a continuous connection is implemented in this area. Whilst on-site, the suitability of providing a connection through to the existing Bridleway (Havant no.28) was explored, with the optimal location demonstrated in **Figure 13**.



Figure 13: Identified connection point onto Scratchface Lane

- 7.7 As part of an approved (and implemented) development for 92 residential dwellings at Land South of Scratchface Lane, adjacent to A3M and West of Brooklands Road (application reference: APP/12/00612), Schedule 1 of the Section 106 agreement stated that '*On or before commencement of the development.... towards the cost of transport improvements including but not limited to: - Scratchface Lane to Crookhorn Lane upgrade Bridleway for shared use*'. The proposed development will therefore not provide any further improvements to this Bridleway other than a suitable connection onto it.
- 7.8 Highway comments raised at the pre-application stage also identified that the walking distances to the existing bus stops would exceed the CIHT guidance of 400m from various locations within the site and therefore provision to either improve the existing situation or provide a service through the site should be explored.

- 7.9 As such, discussions have been held with Stagecoach who provide the most frequent and comprehensive service in the area. Stagecoach have stated that *'stops on College Road would be the best option as any route through the site would be much slower'*. It is therefore proposed that a new pedestrian crossing point and bus stops would be provided along College Road to improve access to local bus services.
- 7.10 The approximate location of the proposed bus stops is demonstrated in **Figure 6**, and as demonstrated on the drawing included in **Appendix M**. It is proposed that the southbound bus stop would be supported by a shelter, flag pole and demarcated layby with the northbound bus stop provided with a demarcated layby and flag pole. Due to third party land constraints it would not be possible to provide a shelter for the northbound bus stop. To facilitate access to the bus stops 2m wide section of footway would be provided to each stop, which would be supported by a pedestrian crossing point in the form of tactile paving and dropped kerbs.



Figure 14: Potential Location of New Bus Stops

- 7.11 The proposed new crossing facility along College Road and the provision of the bus shelters and associated works would all be delivered through the S278 package of off-site highway measures for the site.

7.12 As requested at the pre-application stage an NMU audit has been undertaken to assess the opportunities and constraints for non-motorised users on anticipated desire lines to and from the site. The full NMU is attached as **Appendix N**. It was considered that the existing pedestrian/cycle infrastructure along College Road was sufficient to support the needs of the development when accessing local amenities and schools. While there is potential for further crossing points to be provided along College Road the implementation of these would not be feasible due to the location of third party land.

8. JUNCTION CAPACITY ASSESSMENT

8.1 To identify the highway impact of the proposals, junction capacity analysis has been undertaken at a number of key local junctions:

Scope of Modelling Assessment

8.2 The spatial scope of the modelling assessment required to support the development was informed by the distribution of vehicular trips on the highway network, and was agreed through pre-application discussions with Hampshire County Council. The following junctions were identified as requiring assessment:

- Site access;
- College Road / Purbrook Way;
- Stakes Road Roundabout;
- A3(M) Junction 4 on-slip and off-slip;
- ASDA Roundabout;
- Crookhorn Lane / Portsdown Hill Road; and

8.3 The location of the junctions in relation to the site access is demonstrated in **Figure 15**.

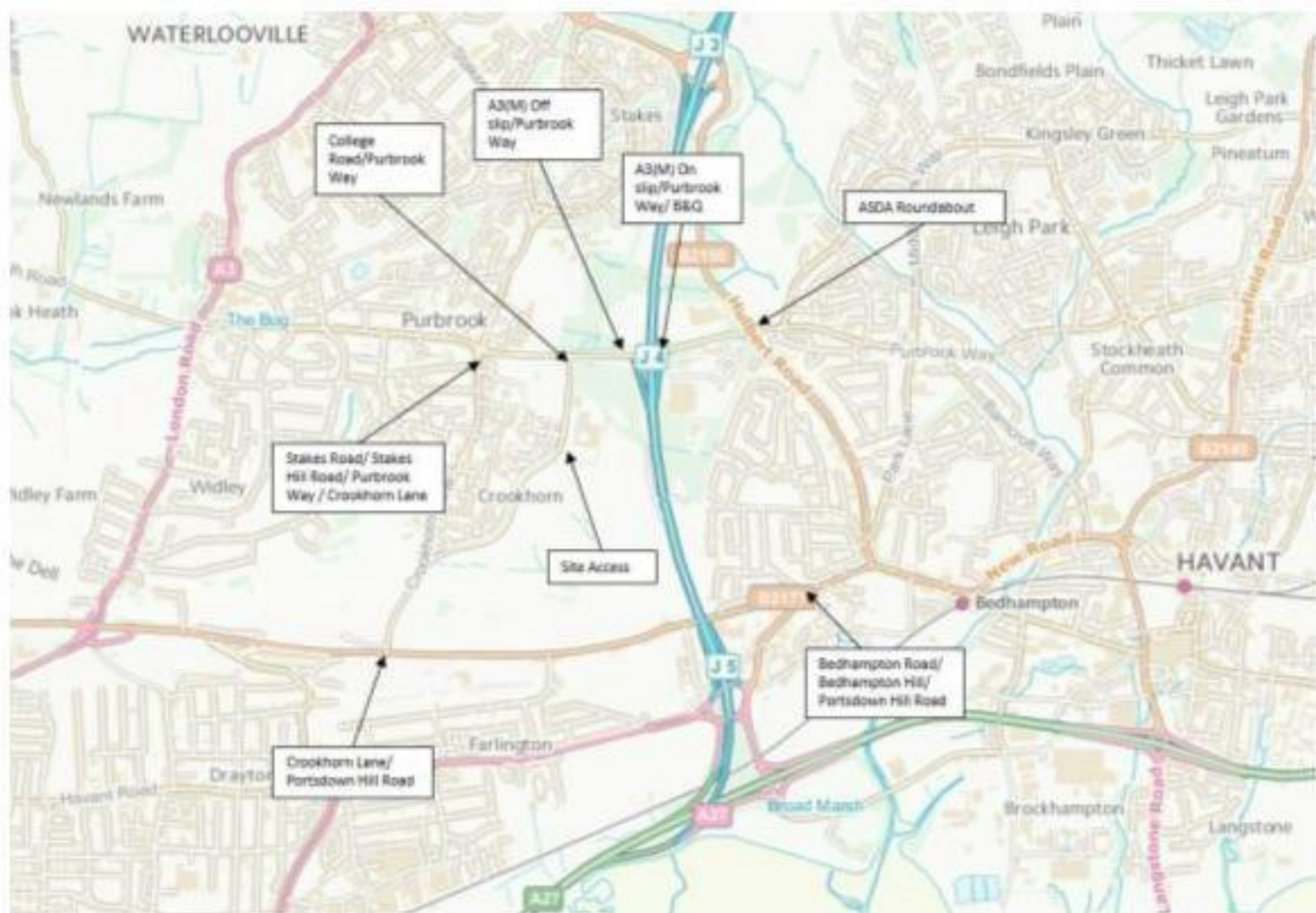


Figure 15: Location of Local Junctions Requiring Assessment

8.4 The junction modelling has covered the following scenarios;

- 2019 Baseline;
- 2029 Baseline; and
- 2029 Baseline + Development

Junction Modelling Software

8.5 The capacity of local junctions has been assessed using both Junctions 9 and LinSig software. Junctions 9 is the industry standard software package for assessing roundabout and priority junctions, and provides a Ratio of Flow to Capacity (RFC) value, which identifies what proportion of each arm's total capacity is currently being utilised. RFC values exceeding 0.85 signify the point at which the capacity of the arm is being approached, and the potential to improve capacity could be explored, whilst RFC values of 1.0 or greater represent a junction operating above capacity. Junctions 9 software also provides values for junction delay (in seconds) and queue length in Passenger Car Units (PCUs).

8.6 LinSig software is the industry standard method for assessing the capacity of signalised junctions. LinSig provides a Degree of Saturation (DoS) value, which identifies the percentage of the junction's total capacity that is in use. DoS values exceeding 90% indicate that the junction is close to operating over capacity, and junction improvements or changes to the signal timings should be considered, whilst DoS values of 100% or greater indicate that the junction is operating over capacity, and not all queuing vehicles will be able to clear the junction within one signal cycle. LinSig software also outputs vehicle delay and queue values to provide indicative details on the operational performance of the junction.

8.7 The method used to estimate the traffic generation of the proposed development and the method used to account for the future years is a worst-case scenario for the following reasons;

- The trip rates used to assess the proposed developments traffic generation are for 'Private Houses' only which produce significantly higher trip rates than mixed/affordable trip rates or mixed housing/flats trip rates. As the rate of affordable housing for this development is 30% in reality trips associated with the site are anticipated to be much lower;
- The modelling and traffic generation does not quantify the impact of a Travel Plan which could achieve a modal shift away from the private car with a sustainable transport strategy; and
- The assessment does not take into account the impact of peak spreading, whereby individuals may exit the development onto the local road network earlier or later to avoid travelling in the peak period.

Results of Junction Modelling

Site Access Junction Modelling

- 8.8 To ensure the proposed site access has sufficient capacity to accommodate the development traffic, a LinSig capacity modelling has been undertaken. The results of the junction model for the '2029 Baseline plus Development' scenario is summarised in **Table 18**, with the full modelling outputs contained in **Appendix O**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCU)	Delay (seconds)	DoS	Queue (PCU)	Delay (seconds)
2029 Baseline + Development						
College Road (SB)	66.2%	6	30.0	60.8%	6	22.2
College Road (NB)	26%	2	12.0	26.4%	1	16.2
Site Access	62%	5	27.8	58.5%	4	35.2

Table 18: Site Access Capacity Assessment

- 8.9 **Table 18** identifies that the site access junction operates well within capacity in the '2029 Baseline plus Development' scenario, with a maximum DoS of 66.2% and queues of 6 vehicles.

Southern Junctions

Crookhorn Lane/Portsdown Hill Junction

- 8.10 The Crookhorn Lane/Portsdown Hill junction has been assessed to determine its suitability for accommodating the proposed development site. At present the junction is provided as a priority junction, with the results for the '2019 Baseline', '2029 Baseline' and '2029 Baseline + Development' scenarios demonstrated in **Table 19** and the full outputs included in **Appendix P**.

Arm	AM Peak Period			PM Peak Period		
	RFC	Queue (Vehicles)	Delay	RFC	Queue (Vehicles)	Delay
2019 Baseline						
Crookhorn Lane – Portsdown Hill (WB)	0.41	0.7	16.13	1.10	18	252.36
Crookhorn Lane - Portsdown Hill Road (EB)	1.56	62	785.94	1.02	12	181.29
Portsdown Hill Road – Crookhorn Lane	0.33	0.5	9.50	0.23	0.3	8.23
2029 Baseline						
Crookhorn Lane – Portsdown Hill (WB)	0.49	0.9	19.23	0.30	0.4	15.05
Crookhorn Lane - Portsdown Hill Road (EB)	2.32	134	2292.13	1.58	87	1502.04
Portsdown Hill Road – Crookhorn Lane	0.40	0.7	11.28	0.30	0.4	10.29
2029 Baseline + Development						
Crookhorn Lane – Portsdown Hill (WB)	0.58	1	23.37	0.37	0.6	16.67
Crookhorn Lane - Portsdown Hill Road (EB)	2.74	182	2414.57	1.92	87	1502
Portsdown Hill Road – Crookhorn Lane	0.43	1	12.00	0.37	1	11.87

Table 19: Crookhorn Lane/Portsdown Hill Junction – Existing Configuration

8.11 The modelling results demonstrate that the junction already operates over capacity in the 2019 baseline scenario, and therefore naturally capacity will decrease with additional development traffic placed upon it in the future year scenarios. Given that the junction is demonstrated as operating significantly over capacity even without the development traffic, potential mitigation options that could be implemented to improve the operation of the junction is provided in **Section 9**.

Northern Junctions

- 8.12 The College Road / Purbrook Way priority junction and the Purbrook Way / Crookhorn Lane / Stakes Road Roundabout were assessed as part of the West of Waterlooville development proposals. As a result, two improvement schemes were identified and subsequently secured through the application's Section 106 agreement. Specifically, these include the signalling of the College Road / Purbrook Way priority junction and the signalling of the Purbrook Way / Crookhorn Lane / Stakes Road roundabout.

College Road/Purbrook Way Junction

- 8.13 To assess the highway impact of the proposals on the consented West of Waterlooville improvements, LinSig models of the approved junction designs have been built. Given that these improvements are due, a 2019 baseline model has not been provided, with the 2029 baseline modelling undertaken assuming the junction improvements are implemented.
- 8.14 The results of the College Road/Purbrook Way junction capacity assessment are summarised in **Table 20**, with the full outputs included in **Appendix Q**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)
2029 Baseline + Development						
Purbrook Way (EB)	79.2	18	24.6	80.9%	9	88.1
Purbrook Way (WB)	90.2%	18	104	87.5%	26	31.0
College Road	164.6%	122	817.8	157.1%	113	772.3

Table 20: College Road/ Purbrook Way Junction Capacity Assessment

- 8.15 **Table 20** demonstrates that the junction is anticipated to approach capacity with the addition of the proposed development, with a maximum Degree of Saturation (DoS) of 164.6%, queues of 122 PCUs and delays of 817.8 seconds. As the junction approaches capacity as a direct result of the proposed development, options to further improve the junction to be implemented as part of the West of Waterlooville development have been explored in **Section 9**.

Stakes Hill/Purbrook Way/Crookhorn Lane Roundabout

- 8.16 The Stakes Hill Road roundabout, situated 900m north west of the proposed site, is currently provided as a 4-arm roundabout. The results for the current operation of the junction are demonstrated in **Table 21** with the full outputs included in **Appendix R**.

Arm	AM Peak Period			PM Peak Period		
	RFC	Queue (vehicles)	Delay (seconds)	RFC	Queue (Vehicles)	Delay (seconds)
2019 Baseline						
Stakes Hill Road	1.13	66	215.17	0.64	1.8	9.68
Purbrook Way	0.62	2	6.68	0.80	4	12.80
Crookhorn Lane	0.42	7	0.7	0.46	1	8.18
Stakes Road	0.62	2	8.60	0.51	1	6.73
2029 Baseline						
Stakes Hill Road	1.35	164	627.54	0.74	3	13.97
Purbrook Way	0.69	2	8.24	0.92	9	28.48
Crookhorn Lane	0.51	1	8.78	0.57	1	11.37
Stakes Road	0.73	3	13.15	0.60	2	8.80
2029 Baseline + Development						
Stakes Hill Road	1.39	184	1.39	0.80	4	18.11
Purbrook Way	0.74	3	9.70	0.95	13	38.28
Crookhorn Lane	0.54	1	9.75	0.59	1	12.27
Stakes Road	0.77	3	15.32	0.63	2	9.76

Table 21: Stakes Hill/Purbrook Way Roundabout Capacity Assessment

8.17 **Table 21** demonstrates that the junction operates over capacity in the AM peak period in the 2019 baseline scenario on the Stakes Hill Road arm. The junction is also shown to be approaching capacity on the Purbrook Way arm with a maximum RFC of 0.92 in the 2029 baseline scenario.

8.18 Given its current capacity constraints, the junction will become signalised as part of the West of Waterlooville development. The capacity of the junction has therefore been assessed for the 2029 baseline scenario. The results are demonstrated in **Table 22** and the full modelling outputs included in **Appendix R**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)
2029 Baseline (90 second cycle time)						
Stakes Road (EB)	83.2%	11	57.1	75.6%	9	50.8
Stakes Hill Road	80.7%	10	53.2	91.2%	13	76.1
Purbrook Way	81.2%	13	47.7	96.7%	20.3	98.6
Crookhorn Lane	77.7%	7	6.13	92.1%	12	85.9

Table 22: Stakes Hill Road Roundabout Improved Configuration

8.19 **Table 22** demonstrates that the junction will operate over the 90% threshold in the PM peak period in the 2029 baseline scenario, even with the proposed improvements that are to be implemented as part of the West of Waterlooville development. Given that the junction is demonstrated to approach capacity in the baseline scenario, it would only naturally worsen as a result of any additional

development being placed upon it. A mitigation measure to further improve the operation of the junction has therefore been put forward in **Section 9**.

A3(M) Roundabouts

- 8.20 Capacity assessment modelling has been undertaken at the A3(M) roundabouts for all scenarios to assess the impact of the development on their operation during both the AM and PM peak periods. The geometries have been calculated from a topographical survey in order to provide a robust assessment. The results of the existing operation of the junction is demonstrated in **Table 23** with the full outputs included in **Appendix S**.

Arm	AM Peak Period			PM Peak Period		
	RFC	Queue (PCUs)	Delay (seconds)	RFC	Queue (PCUs)	Delay (seconds)
2019 Baseline						
J1: Purbrook Way (WB)	0.42	0.8	0.06	0.35	0.6	0.05
J1: A3(M) Off- slip (NB)	0.55	1	0.09	0.72	3	0.13
J1: Purbrook Way (EB)	0.86	6	0.27	0.68	2	0.13
J2: Purbrook Way (Westbound)	0.75	3	0.15	0.60	2	0.09
J2: A3(M) On-slip	-	-	-	-	-	-
J2: Purbrook Way (Eastbound)	0.85	6	0.20	0.78	4	0.14
J2: B&Q Access	0.60	2	0.91	0.76	3	0.98
2029 Baseline						
J1: Purbrook Way (WB)	0.47	1	0.06	0.38	0.7	0.05
J1: A3(M) Off- slip (NB)	0.66	2	0.12	0.84	6	0.24
J1: Purbrook Way (EB)	1.00	31	1.10	0.80	4	0.22
J2: Purbrook Way (Westbound)	0.86	7	0.28	0.68	2	0.11
J2: A3(M) On-slip	-	-	-	-	-	-
J2: Purbrook Way (Eastbound)	0.96	17	0.50	0.89	8	0.26
J2: B&Q Access	1.84	23	10.68	1.61	41	10.01
2029 Baseline + Development						
J1: Purbrook Way (WB)	0.48	1	0.06	0.40	0.7	0.06
J1: A3(M) Off- slip (NB)	0.71	3	0.15	0.96	16	0.64
J1: Purbrook Way (EB)	1.13	120	3.43	0.89	8	0.39
J2: Purbrook Way (Westbound)	0.92	10	0.43	0.73	3	0.13
J2: A3(M) On-slip	-	-	-	-	-	-
J2: Purbrook Way (Eastbound)	0.97	22	0.63	0.95	15	0.45
J2: B&Q Access	2.71	46	36.41	3.08	71	44.25

Table 23: A3(M) Roundabouts – Existing Configuration

8.21 **Table 23** demonstrates that the A3(M) roundabouts are approaching capacity in the 2019 baseline scenario and operates over capacity in the 2029 baseline scenario, before the addition of any development traffic. Given that the junction is demonstrated as operating significantly over capacity on both the Purbrook Way (EB) and B&Q arms in the AM peak period and the B&Q arm in the PM peak period, additional mitigation measures have been explored to increase the capacity at the roundabouts (see **Section 9**).

ASDA Roundabout

- 8.22 To assess the development's impact on the recently improved ASDA roundabout, the development traffic has been applied to HCC's model for the assessment scenarios, which uses 2026 for a future year assessment. Traffic conditions are informed by 2011 traffic surveys growthed to 2026 using the TEMPRO database, along with nearby committed developments at Dunsbury Hill Farm. A summary of the modelling results for HCC's (unchanged) 2026 modelling scenario, without the proposed development, is shown in **Table 24**, whilst the full outputs for all scenarios are contained in **Appendix T**.

2026 HCC Baseline	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)		
	DoS (Percent)	Queue (PCUs)	Delay (Seconds)	DoS (Percent)	Queue (PCUs)	Delay (Seconds)
B2150 Hulbert Road (SB)	56%	3	6	62%	3	8
Purbrook Road (WB)	62%	8	18	60%	9	18
B2150 (NB)	69%	4	19	70%	3	21
ASDA Access	29%	1	6	67%	5	13
Purbrook Road (EB)	73%	10	19	90%	16	42
Junction Overall	73%	-	-	90%	-	-

Table 24: ASDA Roundabout Junction Capacity (2026 HCC Baseline scenario)

- 8.23 **Table 24** identifies that the ASDA roundabout would be approaching capacity in 2026 without the development coming forward, with a DoS for the junction as a whole of 90%. **Table 25** summarises the junction modelling for the 2026 with Development scenario, which adds the proposed development's traffic onto the junction.

2026 HCC Baseline with Development	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)		
	DoS (Percent)	Queue (PCUs)	Delay (Seconds)	DoS (Percent)	Queue (PCUs)	Delay (Seconds)
B2150 Hulbert Road (SB)	58.8%	4	6.3	62.4%	4	8.2
Purbrook Road (WB)	62.2%	8	18.1	78.9%	12	31.6
B2150 (NB)	69.6%	4	19.1	69.1%	5	24.1
ASDA Access	29.1%	1	5.9	69.7%	5	15.6
Purbrook Road (EB)	77.2%	11	20.9	87.5%	15	35.3
Junction Overall	77.2%	-	-	87.5%	-	-

Table 25: ASDA Roundabout Junction Capacity (2026 HCC Baseline + Development Flows)

- 8.24 The results in **Table 25** for the AM peak period utilise the existing HCC signal timings. Minor amendments have been made to the PM peak period signal timings to optimise the operation of the junction and reduce the queuing on each arm.

8.25 It is therefore demonstrated that the proposed development contributes a minimal impact on the operation of the junction which continues to operate under capacity.

Modelling Summary

8.26 Several junction capacity models have been undertaken in this section to assess the development's impact upon the operation of local junctions. A summary of the development's impact on the key junctions is shown in **Table 26**, with a junction being under capacity if it operates with an RFC of up to 0.85 or a DoS of up to 90%; approaching capacity with an RFC of 0.85-1.00 or a DoS of 90%-100%; and over capacity with an RFC greater than 1.00 and DoS greater than 100%.

Junction	2019 Baseline	2029 Baseline	2029 with Development	Mitigation Proposed
Site Access Junction	N/A	N/A	Under Capacity	N/A
College Road/Purbrook Way	N/A	Under Capacity	Approaching Capacity	Yes
Stakes Hill Road/Stake Road/Purbrook Way/Crookhorn Lane Roundabout	Over Capacity	Approaching Capacity	Approaching Capacity	Yes
ASDA Roundabout	N/A	Approaching Capacity (2026 Baseline)	Under Capacity	Yes (Optimise Signal Timings)
A3(M) on-slip and off-slip Roundabouts	Approaching Capacity	Over Capacity	Over Capacity	Yes
Crookhorn Road / Portsdown Hill Road	Over Capacity	Over Capacity	Over Capacity	Yes

Table 26: Summary of Junction Capacity Assessments

9. HIGHWAY MITIGATION

- 9.1 Following the findings of **Section 8** it is noted that several of the junctions in the study area operate over capacity in the 2029 scenarios. Apart from the College Road/Purbrook Way junction, all junctions requiring improvement are at or over capacity in 2029 baseline scenario, with the introduction of development traffic exacerbating any resultant issues with queueing and delay. Mitigation measures have therefore been considered for the affected junctions, and are summarised below:

Crookhorn Lane/Portsdown Hill Road

- 9.2 A highway improvement scheme has been identified to mitigate the impact of the development at this junction. The junction capacity modelling indicated that Crookhorn Lane is currently operating well over capacity, with excessive queues and delays on this arm even in the 2019 baseline scenario.
- 9.3 To improve the operational capacity of the priority junction, a mitigation scheme has been identified to signalise the junction. Comments were raised by Portsmouth City Council (PCC) highway officers over the suitability of a signalised junction and requested that a roundabout be explored.
- 9.4 A roundabout design has been undertaken and is included in **Appendix U** for reference. A number of constraints have been identified associated with the request for a roundabout in this location, as discussed in the subsequent paragraphs.
- 9.5 In the first instance, the roundabout has been located in its position because locating it further north would start to have an impact on third party land and land well outside of the highway boundary. Levels and construction costs dictate the positioning of this roundabout given the steep verge provided along the eastern side of Crookhorn Lane which would result in a large amount of works to maintain a suitable gradient.
- 9.6 In addition, a minimum ICD of 28m would need to be provided, however a roundabout of this size would not enable a shared footway/cycleway to be implemented along the southern boundary as requested by PCC officers. Access for the Gilman Road track would also not be able to be accommodated via any form of access given the proximity to the Portsdown Hill Road (WB) arm and the resultant likelihood for conflict with vehicles travelling westbound.

- 9.7 It should also be noted that the roundabout design included in **Appendix U** has been provided as a one lane approach along the Portsdown Hill Road (WB) arm, however this would likely need to be two lanes in order to cater for right turn manoeuvres into Crookhorn Lane (as per the existing configuration of the carriageway), for which the turning count surveys recorded 165 vehicles completing this manoeuvre in the AM peak period and 115 vehicles in the PM peak period. A two-lane approach would not be achievable given that the roundabout has been placed as far south as possible and cannot achieve the required deflection.
- 9.8 At the pre-application stage, HCC highway officers requested additional vehicle flows to be added to the junction in the AM peak period in accordance with the school trips associated with the Forty Acre Farm development. It has since been confirmed that the school trips from the Forty Acre Farm development are no longer anticipated to attend Moreland's Primary School and will therefore not pass through the Crookhorn Lane/Portsdown Hill Road junction.
- 9.9 Given the constraints to a roundabout design as aforementioned, a signalised junction proves to be the best option for mitigation and would involve widening the existing Crookhorn Lane arms. An indicative drawing of the widening required at this junction is included in **Appendix U**.
- 9.10 The results of the mitigation scheme are summarised in **Table 27**, with the full outputs included in **Appendix U**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)
2029 Baseline + Development + Mitigation						
Crookhorn Lane	88.2%	9	35.9	78.9%	7	40.6
Portsdown Hill Road (EB)	76.2%	14	21.6	80.7%	15	17.4
Portsdown Hill Road (WB)	81.5%	11	21.3	54.6%	6	14.2

Table 27: Crookhorn Lane/Portsdown Hill – Improved Configuration

- 9.11 **Table 27** demonstrates that the suggested improvement scheme would significantly improve the operation of the junction and operate under capacity on all arms with a 65-second cycle time.

College Road/ Purbrook Way

- 9.12 Although the junction has already been identified as subject to improvements as part of the West of Waterlooville development, the proposed development is likely to place 79% of development traffic through this junction, causing it to approach capacity. As such, further improvements are required to mitigate against the impact of the development and ensure the junction operates under capacity.
- 9.13 It is proposed that College Road could be widened to accommodate two lanes for approximately 41m in order to improve the capacity at the junction. An independent Stage 1 Road Safety Audit has been undertaken given that the proposed development will place a significant level of development traffic through this junction. The RSA output is included in **Appendix V** for reference.
- 9.14 The resultant capacity assessment with this configuration is demonstrated in **Table 28**. The indicative junction design and revised junction modelling results are included in **Appendix V**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCUs)	Delay	DoS	Queue (PCUs)	Delay
2029 Baseline + Development + Mitigation						
Purbrook Way (EB)	83.1%	21	74.2	82.2%	7	100.1
Purbrook Way (WB)	86.3%	23	35.1	88%	31	35.6
College Road	88.5%	13	73.0	85.2%	13	76.0

Table 28: Purbrook Way/College Road Improved Configuration

- 9.15 It has therefore been demonstrated that this junction will operate within capacity with a degree of saturation of less than 90% on each arm of the junction.

Stakes Hill Road/Stakes Road/Purbrook Way/Crookhorn Lane

- 9.16 Although the junction has already been identified as subject to improvements as part of the West of Waterlooville development, the results of the 2029 baseline capacity assessment demonstrate the junction is approaching capacity. Given that the junction is approaching capacity, and that the proposed development is likely to place 20% of development traffic through this junction, mitigation measures have been explored to combat the impact of the proposed development.
- 9.17 By adjusting the cycle time of the junction from a 90 second cycle to 120 seconds, the capacity of the junction improves and subsequently produces results back beneath the baseline model results. The results of the modelling assessment are provided in **Table 29**.

Arm	AM Peak Period			PM Peak Period		
	DoS	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)
2029 Baseline + Development (120 second cycle time)						
Stakes Road (EB)	78.8%	13	61.8	70.1%	11	58.5
Stakes Hill Road	78.9%	13	64.69	82%	13	69.2
Purbrook Way	79%	17	52.5	92.9%	22	92.4
Crookhorn Lane	80%	9	78.2	81.8%	12	73.0

Table 29: Stakes Hill Road/Stakes Road/Purbrook Way/Crookhorn Lane – Improved Configuration

9.18 **Table 29** demonstrates that whilst the Purbrook Way arm will operate over the 90% threshold in the PM peak, by altering signal timings and optimising the junction, the additional development traffic would be mitigated against and provide a significant improvement on the Stakes Hill Road arm over the 2029 baseline results demonstrated in **Table 29**.

A3(M) on-slip and off-slip

9.19 A highway improvement scheme has been identified to mitigate the impact of the development at this junction. The junction capacity modelling indicated that Purbrook Way (EB) arm is approaching capacity in the 2019 baseline scenario, is at capacity in '2029 baseline' and overcapacity in the '2029 baseline + development' scenario. In addition, the Purbrook Way (Eastbound) arm is approaching capacity in all scenarios; Purbrook Way (Westbound) is approaching capacity in both the '2029 baseline' and '2029 baseline + development' scenarios; and the B&Q access is over capacity in the '2029 baseline' and '2029 baseline + development' scenarios.

9.20 To improve the operational capacity of the roundabout, an improvement scheme has been identified, which would result in the following changes to the horizontal geometry:

Junction 1: A3(M) Off-slip

- Increasing the entry width of A3(M) off-slip from 7.7m to 8.83m;
- Increasing the effective flare length of A3(M) off-slip from 8m to 24m;
- Reducing the entry width from 34m to 30m;
- Increasing the entry width of Purbrook Way (EB) from 6.3m to 8m; and
- Increasing the effective flare length of Purbrook Way (EB) from 2.5m to 19m;

Junction 2: A3(M) On-slip

- Increasing the entry width of Purbrook Way (westbound) from 7m to 8.83m;
- Increasing the effective flare length of Purbrook Way (westbound) from 10m to 13m;
- Increasing the entry width of Purbrook Way (eastbound) from 7m to 8m;
- Increasing the effective flare length of Purbrook Way (eastbound) from 0m to 18m;
- Increasing the entry width of the B&Q access from 3.7m to 5.9m; and
- Increasing the effective flare length of the B&Q access from 2m to 10m

9.21 Comments raised by HCC highway officers at the pre-application stage suggested that the proposed mitigation would not create any real capacity improvements. However, it is argued that the increases to flare lengths and entry widths do sufficiently increase capacity at the junction given that additional cars can wait in the second lane as opposed to joining the back of the original lane. For example, a second vehicle can now wait at the give way line upon exiting the B&Q access, with a second car also able to join the queue given the 10m flare.

9.22 The resulting junction configuration can be seen in **Appendix W**. Further junction capacity modelling has been undertaken with the improved configuration, with **Table 30** summarising the results of the model and full modelling outputs contained in **Appendix W**.

Arm	AM Peak Period			PM Peak Period		
	RFC	Queue (PCU)	Delay (mins)	RFC	Queue (PCU)	Delay (mins)
2029 Baseline + Development + Mitigation						
J1: Purbrook Way (WB)	0.49	1	0.07	0.42	1	0.06
J1: A3(M) Off- slip (NB)	0.62	2	0.10	0.84	6	0.22
J1: Purbrook Way (EB)	0.92	11	0.38	0.72	3	0.13
J2: Purbrook Way (Westbound)	0.82	5	0.19	0.65	2	0.09
J2: A3(M) On-slip	-	-	-	-	-	-
J2: Purbrook Way (Eastbound)	0.95	16	0.44	0.85	6	0.17
J2: B&Q Access	0.82	3	1.82	0.74	3	0.81

Table 30: A3(M) Roundabouts – Improved Configuration

9.23 **Table 30** demonstrates that the improvement works would have a substantial impact on the overall capacity of the roundabout. The proposed improvement scheme provides a sufficient benefit to accommodate the proposed development with queue lengths all equal to or below the '2029 baseline' scenario results. It has therefore been demonstrated that a wider improvement scheme in relation to this development would be both unjust and unreasonable.

10. SUMMARY AND CONCLUSIONS

- 10.1 This Transport Assessment has been prepared by Paul Basham Associates on behalf of Persimmon Homes to support a hybrid planning application for a residential development comprising up to 780 dwellings at College Road, Campdown. Phase 1 of the site is for 130 dwellings and is considered as a full application with the remainder of the site coming forward as an outline application.
- 10.2 The proposed site use is currently greenfield land and is located approximately 3.5km south of Waterlooville Town Centre and c.4km west of Havant. The site is located within walking distance of a number of facilities and services, with the nearest located c.1km west of the site via Crookhorn Lane.
- 10.3 The site has previously been identified in the Strategic Housing Land Availability Assessment and more recently identified as a draft allocation in Havant Borough Council's Local Plan as suitable for development.
- 10.4 College Road is a single carriageway road, approximately 7m in width and connects to Portsdown Hill Road (as Crookhorn Lane) to the south and Purbrook Way to the north. College Road is subject to a 40mph speed limit across the site frontage, before becoming a 30mph limit approximately 100m north of the proposed site access.
- 10.5 Whilst there have been a number of incidents recorded within the vicinity of the site, only 9 have occurred along College Road, of which 8 were classed as 'slight' in nature and 1 'serious'. The PIA data indicates that the majority of incidents occur at the junctions of College Road/Crookhorn Lane; College Road/Purbrook Way, and Crookhorn Lane/Portsdown Hill Road, as opposed to College Road itself.
- 10.6 The proposed development comprises up to 780 dwellings. The site will be served via a single vehicular access onto College Road via a signalised junction. The access comprises a 7m wide spine road, which will narrow into the site. A right turn lane is also provided to enable northbound traffic along College Road to access the site.
- 10.7 Car parking has been provided in accordance with Havant Borough Council's residential parking standards. For Phase 1, the development is to provide 248 car parking spaces for the residential aspect of the development with an additional 24 visitor parking spaces spread evenly throughout the site.

- 10.8 Trip rates for the site have been previously agreed with HCC at the pre-application stage. The resultant assessment indicates that the development would generate 422 vehicle trips in the AM peak period, 465 vehicle trips in the PM peak period and 3,927 vehicle trips across a 12 hour period. As the existing site is greenfield with no trip generation, the proposal's generated trips would all be additional to the local road network.
- 10.9 The trips associated with the scheme have been distributed across the local road network on the basis of traffic distribution from 2011 'Location of Usual Residence and Place of Work' Census data, and individual turning proportions from independent traffic surveys. Future traffic conditions have been established by applying a growth factor calculated by TEMPRO to the traffic survey results to provide a 10 year future year scenario.
- 10.10 A detailed capacity assessment has been undertaken at a number of local junctions to assess their suitability for accommodating the proposed development. Whilst a number of junctions are either approaching or over capacity, the development itself does not cause any junction other than the College Road/Purbrook Way junction to operate over capacity if it is not already doing so in either the 2019 or 2029 baseline scenarios.
- 10.11 A number of mitigation measures have been explored for junctions where they operate over capacity. Through the mitigation measures proposed, each junction has been demonstrated to operate within capacity or in line with the baseline scenarios, and therefore the impact of the development can be mitigated against.
- 10.12 This Transport Assessment has demonstrated that the proposed development will not have a severe impact on the operation, capacity or safety of the local road network given that no junction aside from the College Road/Purbrook Way junction would operate over capacity that does not already do so in the existing year or future year scenarios; and that the College Road/Purbrook Way junction has been further mitigated to improve its capacity. We therefore encourage HCC highway officers to look favourably upon this development in relation to highways.