OPTIMA
Intelligent Highways Solutions

Land South of Halifax Road, Penistone
Proposed Residential Development
Transport Assessment

March 2020 (Final Issue)

Prepared on behalf of

Barratt Homes and David Wilson Homes Yorkshire West and Yorkshire Land Limited

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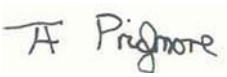
Signature				
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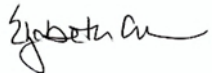
Signature				

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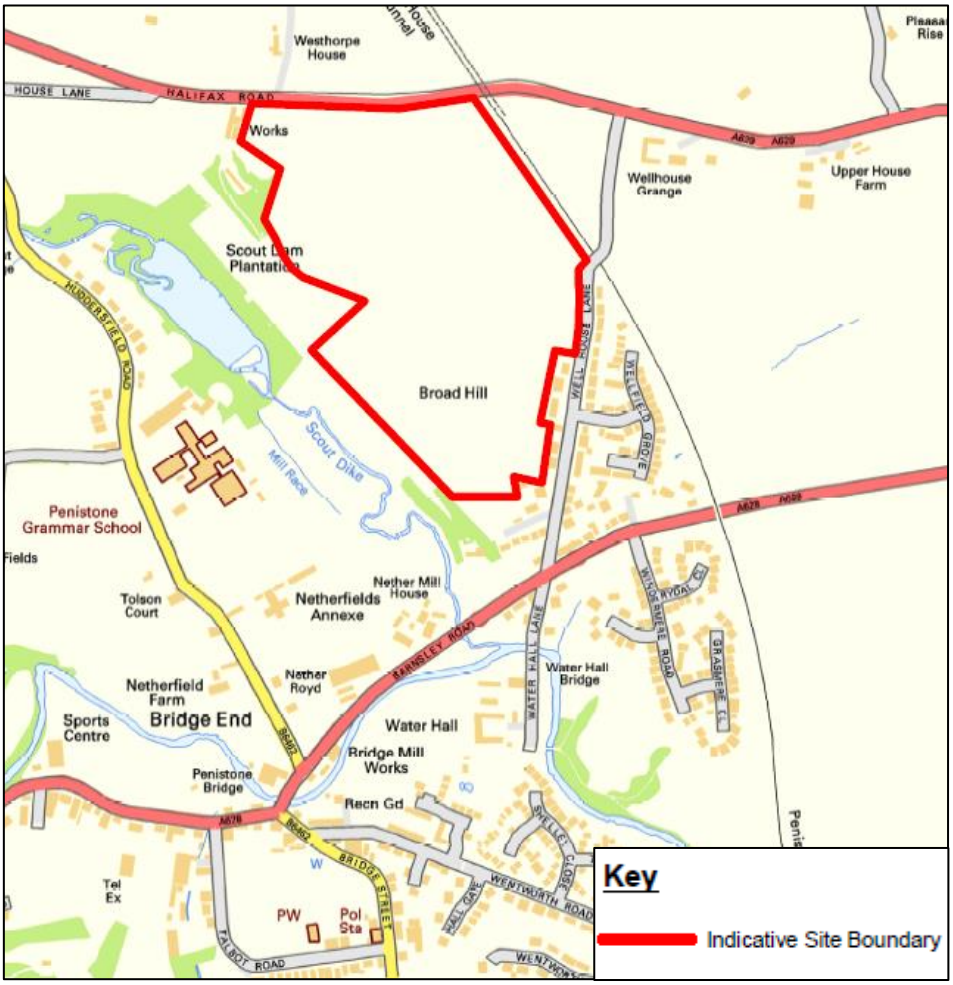
1. Introduction

1.1 INTRODUCTION

1.1.1 Optima Highways and Transportation Consultancy Ltd (Optima) has been appointed by Barratt and David Wilson Homes Yorkshire West and Yorkshire Land Limited to prepare a Transport Assessment (TA) that considers the highways and transportation matters associated with a proposed residential development on land to the south of Halifax Road in Penistone.

1.1.2 The site location in its local context is shown in Figure 2 (Figure 1 shows the location of the site in a wider context) with an extract from Figure 2 shown in Image 1.1.

Image 1.1 Site Location – Local Context



1.1.3 In Barnsley's Local Plan as adopted on 3rd January 2019, the Site is part of a slightly larger housing allocation; HS75 - Land south of Halifax Road, Penistone. The Local Plan allocation considers that the overall site has an indicative capacity of 414 dwellings.

1.2 SCHEME PROPOSAL AND SCOPE OF REPORT

1.2.1 This TA has been prepared to accompany a full planning application for the construction of some 459 dwellings including access, landscaping and areas of public open space (POS).

1.2.2 A Technical Note to cover the scoping of the TA was prepared in October 2018 and provided to officers at BMBC for comment. AECOM had been appointed by BMBC to undertake a review of

the Technical Note and a copy of both Optima's Technical Note and the AECOM response are contained at Appendix A.

1.2.3 This TA has been prepared in accordance with the Department for Communities and Local Government (DCLG) 'National Planning Practice Guidance' published in 2014 which supersedes the Department for Transport (DfT) and DCLG's 'Guidance on Transport Assessment' (GTA) document. Cognisance has also been taken of the National Planning Policy Framework (NPPF), as well as the BMBC Local Plan.

1.2.4 This TA should be read in conjunction with the Residential Travel Plan (RTP) also prepared by Optima to accompany the planning application. The RTP gives a detailed description of the measures that will be implemented to achieve modal shift away from single occupancy car use when compared with initial modal split assumed within this Transport Assessment.

1.2.5 This report sets out the transport impacts relating to the development proposals and identifies what measures may be required to accommodate these impacts. The TA considers the sustainability and accessibility of the site, reviewing the provision for, and quality of, facilities and connections to and from the surrounding areas. The document structure is as follows:

- Section 2 - contains an overview of national and local Transport Policy relevant to the Site;
- Section 3 - describes the Site and the existing transport conditions including a review of collision data for the local highway network;
- Section 4 - defines the development proposals including the access strategy and considers on-site parking and connectivity for non-car modes;
- Section 5 - describes the accessibility of the Site by non-car modes including accessibility to local facilities / services;
- Section 6 - sets out the trip generation and distribution methodologies applied in the assessment of the highway network;
- Section 7 - describes the build-up of traffic flow information for the base and design years and provides a materiality assessment of the highway network;
- Section 8 - provides a commentary of the junction assessments that have been undertaken to determine the impact of the development; and
- Section 9 - summarises and concludes the Transport Assessment.

2. Planning Policy Context

2.1 INTRODUCTION

2.1.1 This section of the Transport Assessment sets out planning policy context against which the proposed development is to be considered insofar as it relates to transportation and highway matters. It sets out the relevant statements of planning policy within the statutory development plan and the National Planning Policy Framework (NPPF) that relate to the scheme. The Government also publishes National Planning Practice Guidance (NPPG) to explain how NPPF policy should be implemented.

2.1.2 S38(6) of the Planning and Compulsory Purchase Act 2014 states that *"If regard is to be has the development plan for the purpose of any determination to be made under the planning Acts the determination must be made in accordance with the plan unless material considerations indicate otherwise."* Therefore, the development plan is the starting point for the determination of planning applications.

2.1.3 The proposed development lies within the administrative boundary of Barnsley Metropolitan Borough Council (BMBC). BMBC is a Unitary Authority and consequently has responsibility for highways and transportation matters within its administrative boundary. Barnsley's Local Plan is the statutory development plan.

2.2 LOCAL POLICY

Barnsley Local Plan

2.2.1 Following public consultation and examination by an Independent Planning Inspector, Barnsley's Local Plan was adopted by Full Council on 3rd January 2019.

2.2.2 The Local Plan identifies Penistone as being a 'Principal Town' and as a long established Pennine rural market town which is an important shopping and service centre serving a large rural hinterland in the west of the borough. The Local Plan states that the Council wants Penistone to be the main local focus for development in the borough's rural west.

2.2.3 Policy LG2 'The Location of Growth' states that, after Urban Barnsley, priority will be given to development in Principal Towns followed by villages.

2.2.4 Penistone is identified to accommodate around 5% of the overall supply of housing for the Borough and the Site is identified as proposed housing allocation Site HS75 Land south of Halifax Road, Penistone. The policy description states that amongst other matters, the development will be expected to *"Provide appropriate off site road safety enhancements"*.

2.2.5 Policy T3 'New Development and Sustainable Travel' sets out the expectations of new development in relation to these matters. This policy sets out that new development should be located and designed to reduce the need to travel, be accessible to public transport and meet the needs of pedestrians and cyclists. Parking is to be provided to at least the minimum levels for cycles, motorbikes, scooters, mopeds and disabled people as set out in the relevant Supplementary Planning Document and Transport Assessments / Statements and Travel Plans are to be provided.

2.2.6 The Local Plan sets out detailed requirements for both Transport Assessments and Travel Plans and notes that Active Traffic Management and Integrated Demand Management types of intervention are preferable to capacity improvements.

2.2.7 Policy T4 'New Development and Transport Safety' is specifically concerned with development being "*expected to be designed and built to provide all transport users within and surrounding the development with safe, secure and convenient access and movement*."

Supplementary Planning Documents and Planning Advice Notes

2.2.8 Following the adoption of the Barnsley Local Plan, BMBC has also adopted several Supplementary Planning Documents (SPD) and Planning Advice Notes (PAN) of which the following, all adopted in November 2019, are concerned with highway and transport-related topics:

- Sustainable Travel SPD – seeks contributions for sustainable and active travel. This SPD also sets out the number of electric vehicle charging points to be provided by developments as a minimum;
- Section 278 Agreements SPD – sets out the process of Section 278 agreements which relate to works within the highway;
- Parking SPD – gives guidance on parking standards; and
- Section 38 Agreements PAN – sets out the process of Section 38 agreements which relate to adoption of highway.

Sheffield City Region Transport Strategy (2011-2026)

2.2.9 The Sheffield City Region Transport Strategy (2011-2026) (SCRTS) is part of the Third Local Transport Plan for South Yorkshire, which includes the districts of Barnsley, Doncaster, Rotherham and Sheffield. It is complemented by an implementation plan which explains how the strategic priorities identified in the SCRTS will be delivered. Due to its strong economic links to West Yorkshire, Barnsley also forms part of the Leeds City Region and is therefore also covered by the Leeds City Region Transport Strategy although as one of the four South Yorkshire districts, Barnsley's transport priorities are fully addressed in the SCRTS.

2.2.10 The SCRTS has four goals for the transport system which are underpinned by a set of 26 policies:

- To support the economic growth of the SCR;
- To enhance social inclusion and health;
- To reduce emissions from vehicles; and
- To make transport increasingly safe and secure.

2.2.11 The SCRTS also sets out the desired outcomes of the strategy following the same themes identified in the four goals. A development according with Policies T3 and T4 of the Barnsley Local Plan will play its part in contributing to the desired outcomes of the SCRTS across all four themes.

South Yorkshire Residential Design Guide (2011)

2.2.12 The South Yorkshire Residential Design Guide (SYRDG) was published in January 2011 and is for residential developers and their design professional, consultants and agents in formulating designs and making applications for planning permission for residential development in South Yorkshire. It is used by the four South Yorkshire local authorities, including BMBC, to support their assessment of proposals and it incorporates both their planning and highway responsibilities.

2.2.13 The Residential Design Guide covers all aspects of design for residential development including provision for cyclists, pedestrians and users of public transport as well as street / junction design and parking provision.

2.2.14 At Section N1.2 the SYRDG covers Accessibility and tables walking distances for residential areas in different types of settlement to local services, the nearest bus/tram stop and primary health/education. In the context of the table at Section N1.2, it is considered that Penistone is a central area (smaller town) and therefore the residential area should be a 20 minute walk to local services, a 5-10 minute walk to a bus/tram stop depending on destination and a 20 minute walk / 30 minute journey to primary health/education.

2.3 NATIONAL POLICY

National Planning Policy Framework

2.3.1 The National Planning Policy Framework was originally published in March 2012 and this has now been replaced by the July 2018 version. Paragraph 1 of NPPF states that *"The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced."*

2.3.2 The new NPPF replaced the old NPPF immediately on publication, with one exception in relation to local plans where the old NPPF continues to apply to the examination of local plans submitted on or before 24th January 2019. The old NPPF is no longer relevant to the determination of planning applications and therefore it is the new NPPF that is the applicable planning policy for this planning application.

2.3.3 Section 9 of NPPF (paras. 102 to 111) is concerned with 'Promoting sustainable development'. Para. 102 states that:

> *"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 can be addressed;*
>
> *b) opportunities to promote walking, cycling and public transport use are identified and pursued;*
>
> *c) 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*
>
> *d) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places."*

2.3.4 Para. 103 notes that the planning system should actively manage patterns of growth in support of these objectives and 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. The NPPF recognises that opportunities to maximise transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-taking.

2.3.5 Paras. 108 to 111 are concerned with 'Considering development proposals'. Para. 108 states that:

"In assessing sites that may be allocated for development on plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users; and

c) any significant impacts from the development on the transport network (in terms of capacity and congestion) or on highway safety, can be cost effectively mitigated to an acceptable degree."

2.3.6 Para. 109 concludes that *"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."*

2.3.7 At para. 110, NPPF provides details of what is expected from development proposals in terms of transport provision stating that:

"Within this context, applications for development should:

a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for efficient delivery of good, and access by service and emergency vehicles; and

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."

2.3.8 Finally, in this section of the NPPF it is stated that *"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."*

National Planning Policy Guidance

2.3.9 On 6th March 2014 the Department for Communities and Local Government launched its planning practice guidance web-based resource. The Ministry of Housing, Communities & Local Government continues to update this resource and will continue to do so, where necessary, to reflect changes to NPPF. Transportation and highways matters are addressed under the heading of 'Travel Plans, Transport Assessments and Statements', 6th March 2014 and 'Design', 6th March 2014.

Travel Plans, Transport Assessments and Statements

2.3.10 The NPPG explains that Travel Plans (TP) and Transport Assessments (TA) are ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development and that they are required for developments which generate significant amounts of traffic movements (Paragraph: 002 Reference ID: 42-002-20140306).

2.3.11 It goes on to advise that a TA may propose mitigation measures where these are necessary to avoid unacceptable or "severe" impacts. Travel Plans are identified as playing an effective role in taking forward those mitigation measures which relate to on-going occupation and operation of the development (Paragraph: 004 Reference ID: 42-005-21040306).

2.3.12 The guidance goes on to state (Paragraph: 006 Reference ID: 42-006-20140306) that TAs and TPs can positively contribute to:

- encouraging sustainable travel;
- lessening traffic generation and its detrimental impacts;
- reducing carbon emissions and climate impacts;
- creating accessible, connected, inclusive communities;
- improving health outcomes and quality of life;
- improving road safety; and
- reducing the need for new development to increase existing road capacity or provide new roads.

2.3.13 With regard to TPs, the guidance advises that these should identify the specific required outcomes, targets and measures, and set out clear future monitoring and management arrangements all of which should be proportionate. TPs should also consider what additional measures may be required to offset unacceptable impacts if targets are not met.

2.3.14 It is necessary for TPs to set out explicit outcomes rather than just identify processes to be followed. A TP should also address all journeys resulting from a proposed development by anyone who may need to visit or stay, and it should seek to fit in with wider strategies for transport in the area (Paragraph: 011 Reference ID: 42-011-20140306).

2.3.15 An important part of the overall strategy for the proposed development is the implementation, maintenance and monitoring of a Residential Travel Plan. The Residential Travel Plan in conjunction with the Transport Assessment are geared towards encouraging sustainable travel.

Design

2.3.16 In Paragraph: 042 Reference ID: 26-042-20140306, the NPPG notes that *"Successful streets are those where traffic and other activities have been integrated successfully, and where buildings and spaces, and the needs of people, not just their vehicles, shape the area."*

2.3.17 The NPPG also notes that *"The likelihood of people choosing to walk somewhere is influenced by not only distance but also by the quality of the walking experience. When considering pedestrians plan for wheelchair users and people with sensory or cognitive impairments. Legible design, which makes it easier for people to work out where they are and where they are going, is especially helpful for disabled people."*

2.3.18 The design of the proposed development very much responds to this part of the NPPG in that it aims to address the needs of people and to encourage all users of the development to use sustainable modes for travel both within and to and from the development.

3. The Site and Existing Highway Network

3.1 EXISTING SITE

3.1.1 The Site is located immediately to the south of A629 Halifax Road on the northern side of Penistone. Its location relative to the local highway network is shown in Figure 2 and an extract is shown in Image 1.1, Figure 1 shows its location in a more strategic setting.

3.1.2 The Site has an overall area of approximately 14.8 hectares (36.6 acres) and is given over to agricultural uses. The Site is bound to the north by A629 Halifax Road, to the east partly by the Penistone Line (the rail line between Huddersfield, Penistone, Barnsley and Sheffield), partly by Well House Lane and partly by the rear of existing properties that front on to Well House Lane, with its south west boundary being denoted by existing field boundaries.

3.1.3 There are two existing field access points into the Site from A629 Halifax Road and an existing field access from Well House Lane along the part of the frontage that is directly bound by the road. There is also a field access into the site from Well House Lane further to the south adjacent No. 15.

3.2 EXISTING LOCAL HIGHWAY NETWORK

Vehicular Network

3.2.1 The A629 is a key route between Huddersfield to the north west and Sheffield, via A61, to the south east. In the vicinity of the Site frontage, A629 Halifax Road is a wide single carriageway road, marked as two lanes and a hatched ghost island central reserve. There is a footway to the northern side of Halifax Road separated from the carriageway by a grass verge. There is no footway along the Site frontage. The road is subject to the National Speed Limit of 60mph for a single carriageway road. Currently weekday traffic flows on A629 Halifax Road in the vicinity of the Site frontage are typically:

- AM Peak Hour (two-way) – 1018 vehicles; and
- PM Peak Hour (two-way) – 778 vehicles.

3.2.2 Some 1.3km to the east of the Site frontage A629 Halifax Road meets A628 Barnsley Road at a four arm roundabout, known as Hoylandswaine Roundabout. The A628 runs in a generally west to east direction from A57 at Hollingworth, across the Woodhead Pass, skirting around the northern side of Penistone to Junction 37 of the M1 Motorway. To the east of Junction 37, the A628 provides a key radial route into the centre of Barnsley and then continues in a north-easterly direction through Cudworth and Ackworth into Pontefract. Current weekday traffic flows in the vicinity of the junction of A628 Barnsley Road and Well House Lane are typically:

- AM Peak Hour (two-way) – 1140 vehicles; and
- PM Peak Hour (two-way) – 1025 vehicles.

3.2.3 More local to the Site, Well House Lane provides a north to south link between A629 Halifax Road and A628 Barnsley Road, meeting each at a priority junction both with ghost island right turn holding lane. Well House Lane is a single carriageway road and, in the vicinity of the Site frontage, has a carriageway width of some 5.5m and a footway to its eastern side of some 2.7m in width. Along the Site frontage to Well House Lane there is currently a grassed verge of some 0.9m in width. Currently weekday traffic flows on Well House Lane in the vicinity of the Site frontage are typically:

- AM Peak Hour (two-way) – 202 vehicles; and
- PM Peak Hour (two-way) – 181 vehicles.

3.2.4 Some 200m south of its junction with Halifax Road, Well House Lane crosses the railway and, in order to reduce the skew and length of span of the bridge, the horizontal alignment of Well House Lane follows an 'S' bend. The speed limit on the southern end of Well House Lane is 30 mph and this changes to 60 mph part way along the site frontage. Street lighting is provided within the 30 mph zone. Well House Lane is also subject to a 7.5T weight limit restriction, except for access.

3.2.5 To the west of the Site, B6462 Huddersfield Road provides another generally north to south link between A629 Halifax Road and A628 Barnsley Road, again meeting each at a priority junction both with ghost island right turn holding lane.

3.2.6 Immediately to the south west of the junction of A628 Barnsley Road and B6462 Huddersfield Road, B6462 continues to the south into the centre of Penistone as Bridge Street from a traffic signal controlled junction with A628. At this junction A628 changes from Barnsley Road to Thurlstone Road as it continues in a westerly direction. B6462 Bridge Street leads into B6462 St Mary's Street at the four arm roundabout with Market Lane and Stottercliffe Road. Some 100m to the south of the roundabout, B6462 continues to the left as Shrewsbury Road and then Sheffield Road out to Oxspring before meeting A629 at Thurgoland.

Pedestrian and Cycle Network

3.2.7 There is a continuous footway on the eastern side of Well House Lane from the railway bridge south to the junction with A628 Barnsley Road. The footway on the west side of Well House Lane starts to the south of the Site frontage and this will be extended along the frontage to connect with the pedestrian infrastructure within the development. At the southern end of Well House Lane pedestrians and cyclists can cross A628 Barnsley Road and continue in a southerly direction down Water Hall Lane into Penistone Town Centre.

3.2.8 This route which is designated as a Public Bridleway (Footpath Number 75) leads through Water Royd Park and on to Wentworth Road before following a route on to B6462 Bridge Street.

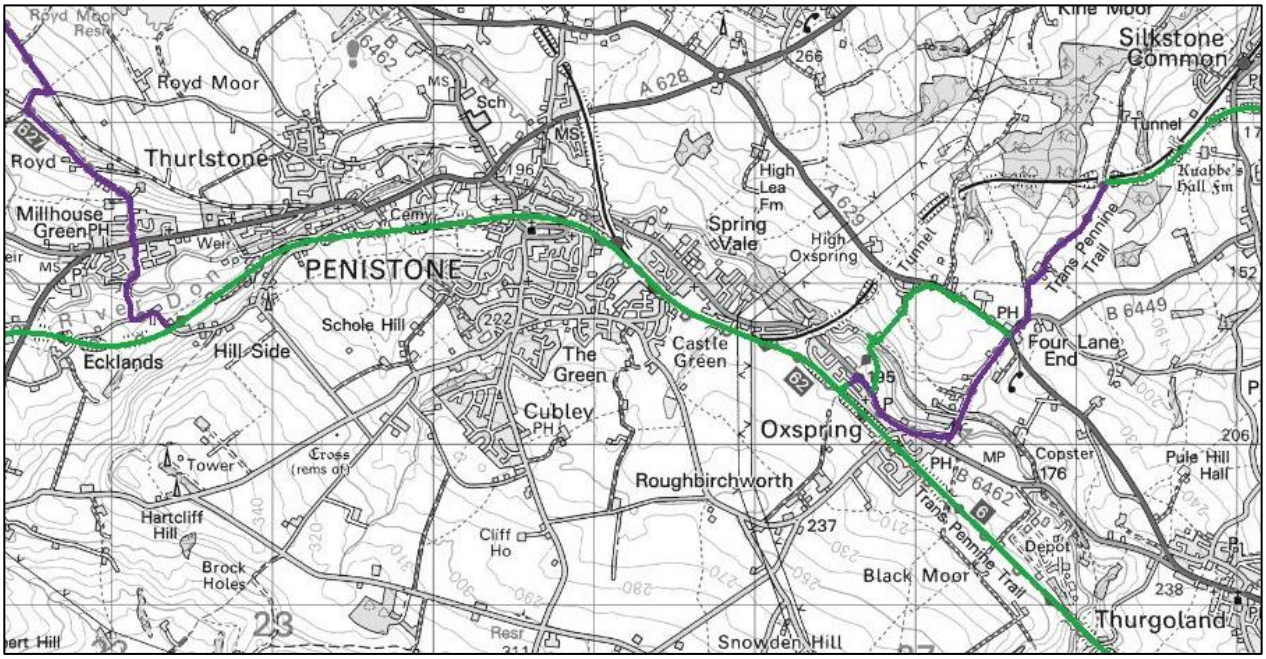
3.2.9 There are also continuous footways on both sides of A628 Barnsley Road leading B6462 Huddersfield Road and the traffic signal controlled junction with B6462 Bridge Street. There is a controlled pedestrian crossing facility on the A628 Barnsley Road arm of the junction. A footway continues up the western side of B6462 Huddersfield Road to Penistone Grammar School.

3.2.10 As well as on-road routes for cycles, Penistone lies on the National Cycle Network Route 62. National Route 62 connects Fleetwood in the Fylde region of Lancashire with Selby in North Yorkshire. It forms the west and central sections of the Trans Pennine Trail which is a long-distance path running coast to coast across northern England. To the west of Penistone is the on-road Route 627 which starts in Kirkburton and goes through Shepley and Millhouse Green before connecting to the Trans Pennine Trail off Shore Hall Lane.

3.2.11 This section of the Trans Pennine Trail follows the route of a disused railway and, to the east of Penistone, in Oxspring the route splits. One spur of the route continues to follow the disused railway line to the south towards Sheffield and Rotherham and another spur continues to the north east towards Barnsley before heading north to Wakefield and Leeds.

3.2.12 An extract from BMBC's cycle route network map is shown below in Image 3.1 with traffic free routes shown in green and on road routes shown in purple.

Image 3.1 Extract from BMBC's Cycle Route Network Map



3.3 EXISTING DATA

Junction Turning Counts

3.3.1 Fully classified turning count surveys have been obtained for a number of junctions on the local highway network. The surveys are scheduled in Table 2.1 and referenced on Figure 3.

Table 3.1 Fully Classified Junction Count Surveys

Ref	Location	Date Undertaken	Assessment Periods
1	A629 Halifax Road / Well House Lane	17th October 2018	07:00-10:00 and 15:00-19:00
2	A629 Halifax Road / A628 Barnsley Road / A629 High Lee Lane / A628 Barnsley Road	17th October 2018	07:00-10:00 and 15:00-19:00
3	A628 Barnsley Road / Well House Lane / Water Hall Lane	17th October 2018	07:00-10:00 and 15:00-19:00
4	A628 Barnsley Road / B6462 Huddersfield Road	17th October 2018	07:00-10:00 and 15:00-19:00
5	A628 Thurlstone Road / A628 Barnsley Road / B6462 Bridge Street	17th October 2018	07:00-10:00 and 15:00-19:00

3.3.2 The results of the traffic surveys identify the following existing weekday peak hours:

- Weekday AM Peak Hour: 07:30 – 08:30; and
- Weekday PM Peak Hour: 17:00 – 18:00

Speed Surveys

3.3.3 Radar gun speed surveys have been undertaken on A629 Halifax Road and Well House Lane in accordance with DMRB TA 22/81 'Vehicle Speed measurement on All Purpose Roads' and a copy of the data is contained at Appendix B.

3.3.4 The surveys were undertaken on Well House Lane on Wednesday 14th November 2018 and on A629 Halifax Road on Friday 16th November 2018 in locations suitable to obtain speed data to inform the design of the access junctions.

3.3.5 The 85th percentile wet weather values that have been calculated from the results of the speed surveys are as follows:

- Well House Lane (Northbound) – 37 mph;
- Well House Lane (Southbound) – 31 mph;
- A629 Halifax Road (Westbound) – 52 mph; and
- A629 Halifax Road (Eastbound) – 54 mph.

Personal Injury Collision Data

3.3.6 Personal injury collision data has been obtained for the highway network in the vicinity of the Site for the available five year period between 1st January 2013 and 31st December 2017. The study area is identified within the accident report obtained from BMBC, as contained at Appendix C, and includes A629 Halifax Road from its junction with B6462 Huddersfield Road to its junction with A628 Barnsley Road, A628 Barnsley Road from its junction with A29 Halifax Road to its junction with B6462 Bridge Street, B6462 Bridge Street south to its junction with St Mary's Street and Market Lane, Well House Lane and B5462 Huddersfield Road.

3.3.7 During the five year period there has been a total of 21 personal injury collisions across the study area – 18 of which were classified as slight in nature and 3 classified as serious.

A629 Halifax Road Corridor

3.3.8 Nine of the collisions occurred on the A629 Halifax Road corridor including its junctions with B6462 Huddersfield Road and B628 Barnsley Road (Hoylandswaine Roundabout), 1 of which was classified as serious in severity with the remaining 8 being classified as slight.

3.3.9 The collision that was classified as serious in severity involved a pedestrian running into the carriageway and into the path of a vehicle, the accident reports suggests that it may have been deliberate. Of the other 8 collisions, 2 occurred at Hoylandswaine Roundabout and both appear to have been caused by a vehicle entering the roundabout colliding with another vehicle already on the roundabout.

3.3.10 2 collisions occurred at the junction of A629 Halifax Road and Well House Lane, one involving a vehicle emerging from the junction and the other involving a vehicle turning right into the junction colliding with another vehicle that was attempting to overtake the turning vehicle.

A628 Barnsley Road Corridor

3.3.11 Eight of the collisions occurred on A628 Barnsley Road corridor including its junction with A628 Thurlstone Road / B6462 Bridge Street, 1 of which was classified as serious in severity with the remaining 7 being classified as slight.

3.3.12 The serious collision occurred at the junction of A628 Barnsley Road / B6462 Bridge Street / A628 Thurlstone Road which is traffic signal controlled. The collision was not as a result of the operation of the junction but involved a motor cycle colliding with a vehicle that was reversing into the parking area at The Bridge Public House.

3.3.13 2 of the collisions involved pedestrians, one of which is reported as being intoxicated. A further 2 collisions occurred at the railway bridge where high vehicles are required to move over into the centre of the road which then results in vehicles travelling in the other direction to give way. Both collisions at the railway bridge were a result of a vehicle running into the rear of a stationary vehicle waiting to pass under the bridge.

B6464 Bridge Street / St Mary's Street

3.3.14 Two collisions occurred in the vicinity of the roundabout at the junction of B6462 Bridge Street / St Mary's Street / Market Lane / Slottercliffe Road both of which involved pedestrians and one of which was classified as serious in severity.

B6462 Huddersfield Road

3.3.15 The remaining two collisions occurred on B6462 Huddersfield Road. Both collisions were classified bas slight in severity, one involved a pedestrian stepping out from between parked cars in to the path of a vehicle and the other was a result of a driver possibly blacking out before colliding with a parked car.

Well House Lane

3.3.16 There have been no personal injury collisions reported on Well House Lane during the 5 year period under consideration.

Crashmap Update

3.3.17 As the personal injury collision data considered above pre-dates the end of 2017, the Crashmap website has been interrogated in order to ascertain whether there have been any further collisions during 2018 (2019 data is not currently available).

3.3.18 There has been no further personal injury collisions during 2018 within the original study area under consideration.

Summary

3.3.19 Having considered the personal injury collision data in detail it is considered that there are no trends in the data or locations that could be considered as 'blackspots' and therefore there is no evidence to suggest that the additional traffic from the proposed development will exacerbate the current situation.

3.4 EXISTING PUBLIC TRANSPORT FACILITIES

Bus Services

3.4.1 There is a bus stop on both sides of A628 Barnsley Road close to the junction with Well House Lane. Both stops are equipped with a shelter, seating and timetable information. There is a pedestrian refuge in the middle of Barnsley Road which allows safer crossing to and from the bus stop on the southern side of the road. These bus stops are used by Service 20 Barnsley Centre - Cubley.

3.4.2 Whilst these are not evident on the ground, up-to-date Bus Service Timetable information for Services 23, 23a, 24, 24a shows that there are bus stops on Well House Lane which are used by Service 24 Barnsley Centre - Ingbirchworth.

3.4.3 Penistone Market Place is the interchange location for bus travel in and around Penistone and all services use the stop in Market Place with some using the nearby stop outside Penistone Church on Shrewsbury Road.

3.4.4 An extract from Barnsley Bus Partnership's Barnsley Bus Map showing the bus services in Penistone is shown in Image 3.2 below with details of the services provided in Table 3.2.

Image 3.2 Penistone Bus Services

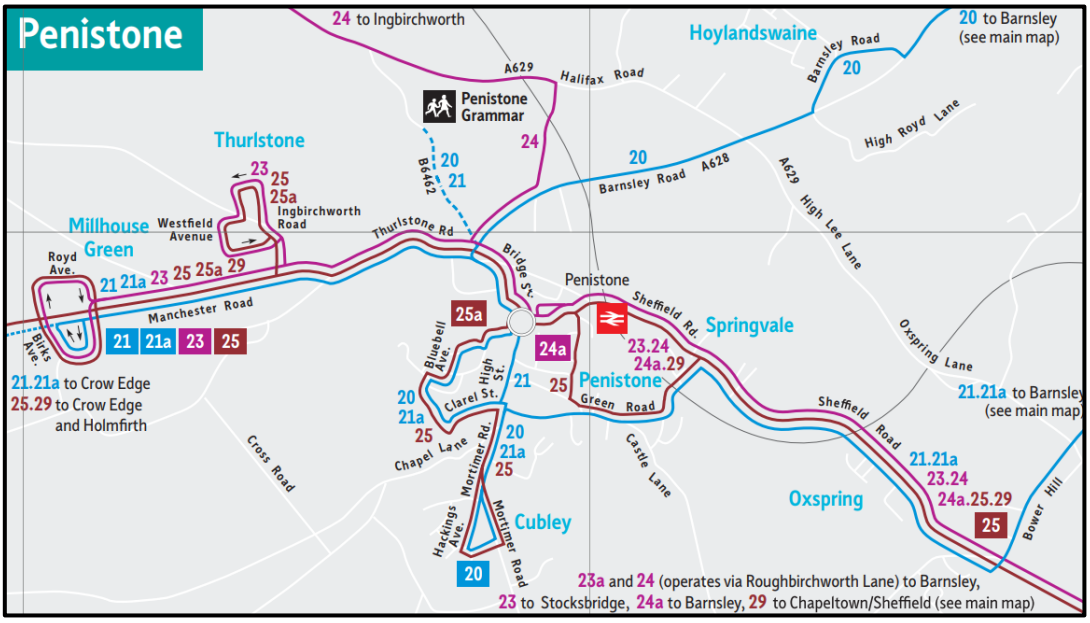


Table 3.2 Summary of Bus Services in Penistone

Service	Route	Days of Operation	Approx. Frequency Each direction	Time of Operation
20	Barnsley Interchange - Pogmoor - Dodworth - Silkstone - Hoylandswaine - Penistone - Cubley	Mon - Fri	1 per hour	07:45-18:30
		Sat	1 per hour	08:50-18:00
		Sun	No Service	-
21 / 21a	Barnsley Interchange - Pogmoor - Dodworth - Silkstone - Silkstone Common - Oxspring - Spring Vane - Penistone - Thurlstone - Millhouse Green - Hazlehead - Crow Edge	Mon - Fri	1 per hour	06:30-22:14
		Sat	1 per hour	07:32-22:14
		Sun	1 per hour	09:57-22:14
23	Millhouse Green - Thurlstone - Penistone - Spring Vane - Oxspring - Thurgoland - Wortley - Deepcar - Stocksbridge	Mon - Fri	1 every 2 hours	09:02-15:46
		Sat	1 every 2 hours	09:02-15:46
		Sun	No Service	-
24/24a	Barnsley Interchange - Kingstone - Gilroyd - Stainborough - Hood Green - Thurgoland - Crane Moor - Thurgoland - Green Moor - Oxspring - Spring Vale - Penistone - Ingbirchworth	Mon - Fri	1 every 2 hours	06:20-22:00
		Sat	1 every 2 hours	07:09-22:00
		Sun	1 every 2 hours	09:00-22:00

29	Sheffield - Burngreave - Chapeltown - High Green - Wortley - Thurgoland - Penistone - Millhouse Green - Dunford Bridge - Holmfirth	Mon - Fri	1 every 3 hours	07:10-23:07
		Sat	1 every 3 hours	07:15-23:07
		Sun	1 every 2 hours (Chapeltown-Penistone)	08:57-23:07

Rail Services

3.4.5 Penistone Railway Station is located approximately a 1.2 km straight line distance to the south east of the Site. Penistone is on the Northern Huddersfield to Sheffield (Penistone Line) which provides services between Penistone and Huddersfield, Barnsley, Meadowhall and Sheffield. Between Penistone and Huddersfield the local stations of Denby Dale, Shepley, Stocksmoor, Brockholes, Honley, Berry Brow and Lockwood are served.

3.4.6 The Penistone Line provides 1 train per hour in each direction, Monday to Saturday (06:20-23:26) and 1 train per hour in each direction on Sunday (09:41-20:23).

3.4.7 The station has cycle storage for 16 bicycles which is covered by CCTV and a free car park for 15 vehicles.

4. Development Proposals and Access Arrangements

4.1 PROPOSED DEVELOPMENT

4.1.1 The scheme proposals are shown on the STEN Architecture drawing 2001.01 rev B, a copy of which is contained at Appendix D. The proposals are for:

- Up to 459 residential units comprising a mix of terraced, semi-detached and detached properties; and
- Associated access and parking; and landscaping including areas of Public Open Space (POS).

4.2 ACCESS ARRANGEMENTS

4.2.1 Two points of vehicular access will be provided into the site; a priority junction with ghost island right turn holding lane will be the means of access from A629 Halifax Road and a simple priority junction will provide access from Well House Lane. The layout for each junction is shown in Optima drawing nos. 20005-GA-01 and 20005-GA-02 respectively as contained at Appendix E and F.

4.2.2 The junction on A629 Halifax Road has been designed generally in accordance with Design Manual for Roads and Bridges (DMRB) CD 123 'Geometric design of at-grade priority and signal-controlled junctions'. The length of the visibility splays provided out of each junction has been informed by the radar speed surveys carried out on 14th and 16th November 2018.

4.2.3 There will be a separate pedestrian / cycle access out on to Well House Lane at the south east corner of the development at the location of the existing field access adjacent No. 15.

4.3 INTERNAL LAYOUT AND SERVICING

4.3.1 The proposed development will be served by a network of internal roads of varying hierarchy. There will be a primary route through the development linking Halifax Road and Well House Lane and lower order streets and private drives to serve five dwellings and under.

4.3.2 Turning heads are provided at the ends of any adopted culs-de-sac to allow adequate servicing.

4.4 PARKING PROVISION

4.4.1 BMBC has produced a Supplementary Planning Document (SPD) on 'Parking' which was adopted in November 2019. to support its emerging Local Plan. Table 1 of the Parking SPD sets out parking standards for broad categories of development and for C3 Dwelling Houses Borough wide (excluding Barnsley Urban) the maximum number of spaces allowed are 1 space for dwellings with 1 or 2 bedrooms and 2 spaces for dwellings with 3 or more bedrooms.

4.4.2 Table 1 of the Parking SPD also requires 1 visitor space per 4 dwellings subject to layout with flexibility for visitor parking being considered on a site by site basis.

4.4.3 The Parking SPD refers to the Sustainable Travel SPD in relation to the requirement for electric vehicle charging points (EVCPs) and the requirement for residential development is 1 charging point per dwelling with dedicated parking or 1 charging point per 10 spaces where parking is unallocated.

4.4.4 The SPD also refers to the South Yorkshire Residential Design Guide (SYRDG) for advice on the design of residential car parking and garages and states that developments will be expected to

meet the standards for parking design set out in the SYRDG considering cycle, motorcycle and car parking as an integral part of the design of residential development.

5. Site Accessibility and Measures to Influence Travel Behaviour

5.1 ACCESSIBILITY ON FOOT

5.1.1 The measures proposed which will positively influence trips on foot by proposed residents include:

- Boundary connections with the existing highway network on both the northern frontage on to A629 Halifax Road and at two locations on the eastern frontage on to Well House Lane. This will also provide a through route for existing pedestrians wanting to walk between A629 Halifax Road and Penistone;
- Internal links and pedestrian routes to create the shortest possible distances to the boundary connections; and
- Travel Plan initiatives for residents.

5.1.2 The residential design guide 'Manual for Streets' (MfS) advises that *"walkable neighbourhoods are typically characterised by having a range of facilities within ten minutes (up to about 800m) walking distance of residential areas…"* (ref para 4.4.1). However, this is not regarded as an upper limit in MfS and reference is also made to walking offering *"the greatest potential to replace short car trips, particularly those under 2km"*. The acceptability of walking trips up to 2km (an approximate 25 minutes' walk time) is also supported in the CIHT document 'Providing for Journeys on Foot', 2000.

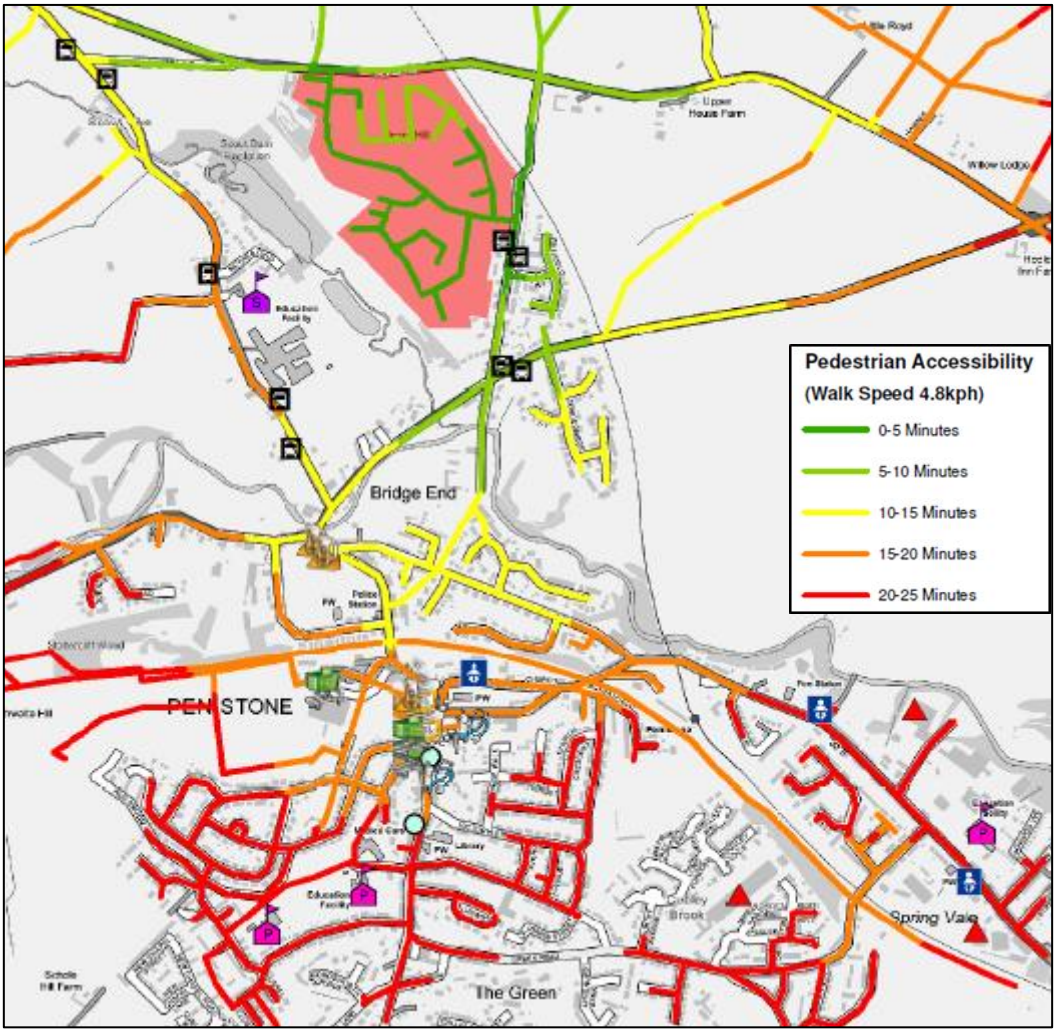
5.1.3 The Department for Education (DfE) statutory guidance document, 'Home to School Travel and Transport', July 2014, defines an even greater maximum walking distance to schools of 2 miles (3.2km) and 3 miles (4.8km) for children under and over 8 years respectively.

5.1.4 Using GIS Network Analysis software, typical walk times (up to 25 minutes which equates to a distance of 2km) from the centre of the Site are shown on Figure 4 with an extract provided in Image 5.1 below. This figure and the extract demonstrate that the Site is within an easy walking distance of the following:

- Saint John the Baptist Primary School and Saint John the Baptist Church of England (VC) Infant School along with Spring Vale Primary School, within a 20-25 minute walk;
- Penistone Grammar School, within a 15-20 minute walk;
- The local shops and services including NatWest Bank, a Post Office, Tesco, The co-operative Food and a Spa, within a 15-20 minute walk; and
- Local medical facilities including Penistone Group Practice, a Dental Practice, several pharmacies and Auckland Opticians, within a 5-15 minute walk.

5.1.5 There is a good selection of takeaways, restaurants, public houses and cafes no more than 15 minutes' walk and local employment opportunities in Penistone Town Centre and at Springvale are within a 20 minute walk.

Image 5.1 Extract of Pedestrian Accessibility Plan



5.1.6 It is therefore concluded that the proposed residential development will be provided with good accessibility on foot to a wide range of services and facilities in accordance with national MfS, CIHT and DfE guidance.

5.1.7 The SYRDG also contains guidelines for accessibility and, in this regard, it is considered that Penistone is a central area (smaller town). The residential area should therefore be a 20 minute walk to local services, a 5-10 minute walk to a bus/tram stop and a 20 minute walk/30 minute journey to primary health/education. It has been demonstrated that the proposed development will meet these local accessibility criteria.

5.2 ACCESSIBILITY BY CYCLE

5.2.1 The measures proposed which will positively influence trips on foot by proposed residents include:

- Boundary connections with the existing highway network on both the northern frontage on to A629 Halifax Road and at two locations on the eastern frontage on to Well House Lane. This will also provide a through route for existing cyclists wanting to cycle between A629 Halifax Road and Penistone;

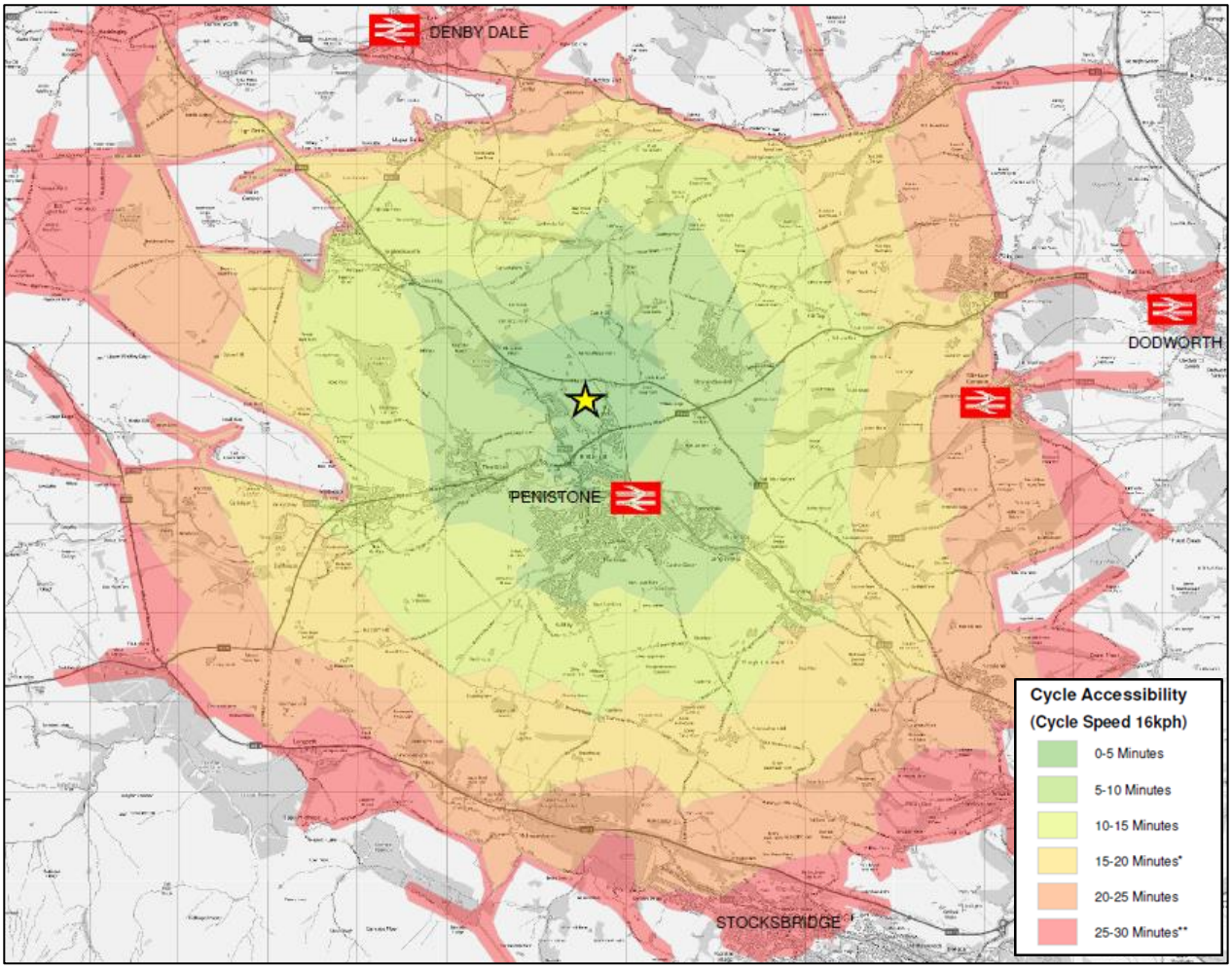
- Internal links and routes to create the shortest possible distances to the boundary connections; and
- Travel Plan initiatives for residents.

5.2.2 An acceptable and comfortable distance for general cycling trips is considered to be up to 5 kilometres as referred to in DfT's Local Transport Note 2/08. However, the same guidance also refers to commuting cycle trips of up to 8km. From the Site, an 8km catchment area encompasses all of Penistone, Denby Dale and parts of Stocksbridge and Dodworth which opens up a wider variety of employment opportunities for residents.

5.2.3 Using GIS Network Analyst software typical cycle times (up to 30 minutes which broadly equates to a distance of 8km) from the Site are shown in Figure 5 and an extract is provided in Image 5.2. Figure 5 illustrates that:

- The majority of Penistone including the wide variety of shops and services is within a 10 minute cycle ride; and
- The Railway Station at Penistone where cycle parking is provided is just over a 5 minute cycle ride.

Image 5.2 Extract of Cycle Accessibility Plan



5.2.4 It is concluded that the Site will be provided with good accessibility by cycle to a wide range of local services, facilities and employment opportunities, many of which are within a very short cycling distance.

5.3 ACCESSIBILITY BY BUS

5.3.1 The measures proposed which will positively influence trips by bus for proposed residents include:

- Boundary connections with the existing highway network on both the northern frontage on to A629 Halifax Road and at two locations on the eastern frontage on to Well House Lane. This will allow access to existing bus stops on Well House Lane and A628 Barnsley Road;
- Internal links and routes to create the shortest possible distances to the boundary connections and therefore the bus stops;
- The provision of on-site highway infrastructure that is capable of accommodating bus service provision within the development; and
- Travel Plan initiatives for residents.

5.3.2 The most frequent bus services are accessed from the stops on A628 Barnsley Road where there is one bus an hour to Barnsley Town Centre and return. The bus stops in Market Place and Shrewsbury Road which provide additional services are approximately 15 minutes' walking distance from the proposed development.

5.3.3 It is concluded that the Site will be provided with reasonable accessibility by bus to key local destinations which offer a wide range of services, facilities and employment opportunities.

5.4 ACCESSIBILITY BY RAIL

5.4.1 Penistone Railway Station provides regular, hourly connections to several key destinations within the local region including Huddersfield (30 minute journey time), Barnsley (16 minute journey time) and Sheffield (45 minute journey time). From Huddersfield it is possible to interchange on to trains to Leeds and Manchester. From Sheffield it is possible to interchange on to trains to Leeds, Birmingham and London.

5.4.2 The railway station can be accessed by:

- Walking – within a 15-20 minute journey time;
- Cycle – within a 5-10 minute journey time; and
- By car – typical 5 minute journey time (plus any walking time between car park and platforms)

5.4.3 It is therefore concluded that the Site will be provided with reasonable accessibility by rail to principal local and regional destinations which offer a vast range of services, facilities and employment opportunities.

5.5 RESIDENTIAL TRAVEL PLAN

5.5.1 A Residential Travel Plan has been prepared to accompany this Transport Assessment. This demonstrates the connectivity between the Site and surrounding amenities, highlighting the opportunities for future residents to access these by means other than the car. It also sets out the

ways in which the applicant will facilitate and encourage trips by sustainable modes of travel, by implementing a series of measures including (but not limited to):

- The appointment of a Travel Plan Coordinator to ensure the Travel Plan is delivered to full effect;
- A development-specific travel information website, offering a one-stop shop for residents to easily access information to enable them to make informed decisions about how they travel;
- A travel information guide that will be displayed in the sales office to sell the accessibility of the development to potential future residents, this guide will also be provided to all new occupiers;
- Personalised journey planning; and
- Ongoing communication with residents regarding local travel options via an annual newsletter.

5.5.2 The Travel Plan also includes targets, which reflect the trip generation within this Transport Assessment; monitoring will be undertaken on an annual basis, following first occupation and the results of this process reported to the Council.

5.6 SUMMARY

5.6.1 In summary it is concluded that the Site will be provided with good accessibility for pedestrians, cyclists and by public transport to a wide range of local services, facilities and employment facilities. This will be reinforced by the implementation, management and monitoring of a Residential Travel Plan at the development.

5.6.2 As such the Site is in a sustainable location and is compliant with NPPF which requires that *"appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location"* and *"safe and suitable access to the site can be achieved for all users"* (para 108) and states that *"applications for development should ….. give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus and other public transport services. And appropriate facilities that encourage public transport use"* (para 110).

6. Trip Generation and Distribution

6.1 VEHICULAR TRIP GENERATION

6.1.1 In order to obtain a suitable vehicular trip rate for the proposed development, the TRICS 7.5.3 on-line database has been interrogated using the following parameters:

- Land use: 03 – Residential, Category: A Houses Privately Owned;
- Calculation options: Vehicular trip rates selected;
- Regions: Greater London and Irish sites excluded;
- Number of dwellings: 50 to 600 units;
- Date range: 01/01/10 to 19/04/18;
- Survey days: Monday – Friday; and
- Location type: Suburban and Edge of Town.

6.1.2 The full TRICS output is contained at Appendix G with the 85th percentile weekday AM and PM peak hour trip rates and resultant generated traffic for 459 dwellings shown tabulated below in Table 6.1. 85th percentile trip rates have been calculated to ensure a robust assessment of the likely impact of the development traffic on the operation of the local highway network.

Table 6.1 85th Percentile Trip Rates and Resultant Traffic Generation

Time Period	Vehicular Trip Rates (per dwelling)			Traffic Generation (459 Dwellings)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak 08:00-09:00	0.240	0.385	0.625	110	177	287
PM Peak 17:00-18:00	0.444	0.149	0.593	204	68	272

6.2 MULTI-MODAL TRIP GENERATION

6.2.1 In order to establish the base-line trip generation by mode for the proposed development the 2011 Census data has been interrogated for the residential areas surrounding the Site which are considered to best represent the likely future base-line travel characteristics for the Site.

6.2.2 The Site is within 2011 Barnsley 016 Super Output Area - Mid Layer, however this is a predominantly rural area and therefore Barnsley 024 has been selected as this covers Penistone and its main residential areas.

6.2.3 Image 6.1 shows the extents of Barnsley 024 2011 Super Output Area - Mid Layer and the mode splits taken from QS701EW - Method of travel to work data for this area are shown in Table 6.2.

Image 6.1 Barnsley 024 Super Output Area - Mid Layer

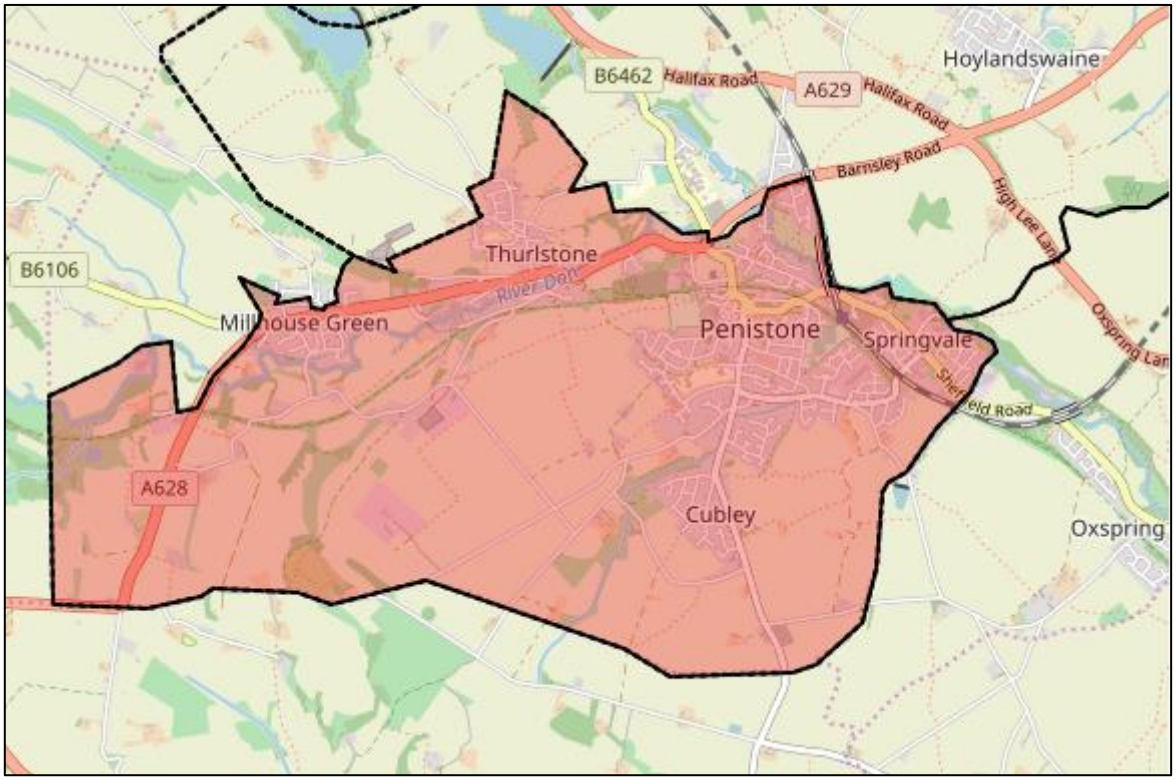


Table 6.2 Residential Census Mode Split (Barnsley 024 Super Output Area - Mid Layer)

Method of Travel to Work	Total Residents in SOAML	Percentage
Work Mainly at or From Home	228	4.6%
Underground, Metro, Light Rail or Tram	9	0.2%
Train	117	2.4%
Bus, Minibus or Coach	114	2.3%
Taxi	7	0.1%
Motorcycle, Scooter or Moped	34	0.7%
Driving a Car or Van	3571	72.8%
Passenger in a Car or Van	258	5.3%
Bicycle	37	0.8%
On Foot	509	10.4%
Other	22	0.4%
Total	4118	100%

6.2.4 From the total vehicular trip generation from the TRICS data and the Census modal split for existing residents, it is possible to calculate the anticipated number of trips by mode for each of the weekday peak hours. The resulting predicted number of weekday AM and PM peak hour development trips by mode are shown in Tables 6.3 and 6.4 respectively.

Table 6.3 Proposed Weekday AM Multi Modal Trip Generation

	AM Peak Hour Trip Generation by Mode		
Trip Type	**Arrivals**	**Departures**	**Total**
Homeworking	7	11	18
Tram	0	0	0
Train	4	6	10
Bus	3	6	9
Taxi	0	0	0
Motorcycle	1	2	3
Vehicle Driver	110	177	287
Vehicle Passenger	8	13	21
Cyclist	1	2	3
Pedestrian	16	25	41
Other	1	1	2
Total	151	243	394

Table 6.4 Proposed Weekday PM Multi Modal Trip Generation

	PM Peak Hour Trip Generation by Mode		
Trip Type	**Arrivals**	**Departures**	**Total**
Homeworking	13	4	17
Tram	0	0	0
Train	7	2	9
Bus	6	2	8
Taxi	0	0	0
Motorcycle	2	1	3
Vehicle Driver	204	68	272
Vehicle Passenger	15	5	20
Cyclist	2	1	3
Pedestrian	29	10	39
Other	1	0	1
Total	280	93	373

6.3 RESIDENTIAL TRIP DISTRIBUTION AND ASSIGNMENT

6.3.1 Having established the weekday AM and PM peak hour vehicular trip generation for the proposed development, as shown in Table 6.1, a distribution exercise has been completed to predict the assignment of these trips on to the local highway network. The latest 2011 Census data for the Barnsley 024 Super Output Area - Mid Layer has been interrogated to obtain the places of work of residents by Super Output Area - Mid Layer.

6.3.2 Once the destinations for the trips has been ascertained, an assessment has been made based on journey time of the likely routes that will be taken and, from this, the trips have been assigned to the local highway network. The spreadsheet at Appendix H provides details of the trip distribution exercise and Figure 120 shows the route assignment on percentage terms.

6.3.3 The weekday AM and PM peak hour traffic flows from the proposed development are then shown in Figures 121 and 122 respectively.

7. Traffic Flows and Materiality Assessment

7.1 EXISTING PEAK HOUR TRAFFIC FLOWS

7.1.1 The October 2018 traffic surveys identified the following existing weekday peak hour periods:

- Weekday AM Peak Hour: 07:30 – 08:30; and
- Weekday PM Peak Hour: 17:00 – 18:00.

7.1.2 The traffic count flows for these periods at the junctions within the study area are shown in Figures 100 and 101 respectively.

7.2 BASE TRAFFIC FLOWS

Committed Development Flows

7.2.1 BMBC's Planning Portal has been interrogated to ascertain whether there are any significant development proposals in the area which are committed but the generated traffic flows will not have been included within the October 2018 traffic surveys.

7.2.2 A map-based search has revealed that there are no recent planning applications or planning permissions for any significant development proposals in the local area and therefore no additional traffic has been taken account of in this regard.

Future Assessment Year and Traffic Growth

7.2.3 Traffic growth is predicted based on a combination of proposed future development, car ownership and changing attitudes in the way people use and have access to their vehicles. To reflect the likely growth in existing traffic at the full Opening Year for the proposed development, TEMPro growth factors have been obtained to be applied to the 2018 existing peak hour flows.

7.2.4 A Design Year of 2030 has been assumed to represent the full Opening Year of the proposed development based on a construction period of some 10 years (50 dwellings per annum), starting in 2020.

7.2.5 Traffic growth rates, between 2018 and 2030, have been obtained from TEMPro v7.2 for the Barnsley 024 Super Output Area - Mid Layer. As the local traffic growth rates are based on the likely development that will take place in the area, there would be an element of double counting if the full growth rates were applied to the existing traffic flows and then the predicted traffic generation from the proposed development added. TEMPro allows a manual adjustment to be made to the growth rates to subtract the number of dwellings to be built at Halifax Road from the total number that has been assumed in the derivation of the growth rates.

7.2.6 The resulting values for the AM and PM peak hour growth between 2018 and 2030 are as follows with the TEMPro output provided at Appendix I:

- AM Peak TEMPro Traffic Growth Rate 2018-2030: 1.115; and
- PM Peak TEMPro Traffic Growth Rate 2018-2030: 1.109

7.2.7 The traffic growth rates have been applied to the 2018 AM and PM existing peak hour traffic flows to obtain 2030 Base AM and PM peak hour traffic flows and these are shown in Figures 110 and 111 respectively.

7.3 DESIGN TRAFFIC FLOWS

7.3.1 Adding the proposed development trips shown in Figures 121 and 122 for the AM and PM peak hours respectively to the 2030 Base Traffic Flows provides the 2030 Design Traffic Flows which are shown in Figures 130 and 131 for the AM and PM peak hours respectively.

7.3.2 It should be noted that the design year flows have been run on 460 units to allow for any changes in the level of development.

7.4 MATERIAL IMPACT

7.4.1 A materiality assessment of the following junctions has been undertaken in order to determine if further capacity modelling is required:

- A629 Halifax Road / A628 Barnsley Road Roundabout (Hoylandswaine Roundabout);
- A629 Halifax Road / Well House Lane priority junction;
- A629 Halifax Road / B6462 Huddersfield Road priority junction;
- A628 Barnsley Road / Well House Lane / Water Hall Lane staggered priority junctions;
- A628 Barnsley Road / B6462 Huddersfield Road priority junction; and
- A628 Thurlstone Road / A628 Barnsley Road / B6462 Bridge Street traffic signal controlled junction.

7.4.2 The previous national 'Guidance on Transport Assessment', March 2007, (now withdrawn) suggested that a development traffic generation of 30 two-way trips represented an appropriate threshold figure above which further assessment may be required but below which the impact could be considered as non-material. Whilst the Government's current NPPG does not specifically refer to 30 trips, this remains a threshold which is generally applied within the industry including by local authorities and Highways England.

7.4.3 Therefore, in terms of assessing the materiality of the impact at the junctions above, Table 7.1 summaries the areas of maximum impact of the development traffic at each of the junctions.

Table 7.1 Materiality Assessment at Local Junctions

Junction	Area of Maximum Impact	AM Peak	PM Peak
Hoylandswaine Roundabout	A629 Halifax Road entry flow	94	36
	A628 Barnsley Road entry flow	54	101
A629 Halifax Road / Well House Lane priority junction	A628 Halifax Road two-way flow	106	100
A629 Halifax Road / B6462 Huddersfield Road priority junction	A628 Halifax Road two-way flow	21	20
A628 Barnsley Road / Well House Lane / Water Hall Lane staggered priority junctions	Well House Lane turning movements	67	26
	Right turn into Well House Lane	20	38
A628 Barnsley Road / B6462 Huddersfield Road priority junction	A628 Barnsley Road two-way flow	55	52
A628 Thurlstone Road / A628 Barnsley Road / B6462 Bridge Street traffic signal controlled junction	A628 Barnsley Road entry flow	33	13
	B6462 Bridge Street entry flow	13	24

7.4.4 From Table 7.1 all the listed junctions, apart from the priority junction of A629 Halifax Road and B6462 Huddersfield Road, are subject to additional flows as a result of the proposed development of more than 30 vehicles on one or more arms in each of the peak hours and therefore capacity modelling assessments have been carried out for each as detailed in Section 8.

8. Operational Assessment of Highway Network

8.1 INTRODUCTION

8.1.1 This section of the Transport Assessment sets out the results of the individual junction capacity assessments that have been undertaken to determine the impact of the development proposals on key junctions on the local highway network.

8.1.2 This section also contains the capacity assessment of the two development access junctions to demonstrate that the forms of junction that are proposed are adequate and appropriate to serve the quantum of development proposed.

8.1.3 The output for all junction capacity assessment is contained at Appendix J with the results summarised in the tables below.

8.2 EXISTING JUNCTION ASSESSMENTS

A629 Halifax Road / Well House Lane Priority Junction

8.2.1 This priority junction has been modelled using the PICADY 9 Priority Intersection module in the TRL software, Junctions 9. Three and four-arm unsignalised give-way intersections are modelled using well-established TRL/Kimber capacity relationships, which take into account key geometries such as road widths, visibility and the space available for traffic making an offside turn. This empirical framework intrinsically links priority junction geometry to driver behaviour and in turn to predicted capacities, queues and delays.

8.2.2 The existing layout of the junction is shown in Figure 7 and the junction has initially been modelled for the 2018 existing weekday AM and PM peak hours. The results of the modelling are summarised in Table 8.1.

Table 8.1 A629 Halifax Road / Well House Lane – 2018 Existing PICADY Results

Movement	AM Peak Hour			PM Peak Hour		
	RFC	Mean Queue	Recorded Queue	RFC	Mean Queue	Recorded Queue
Left turn – Well House Lane to A629 Halifax Road (B-C)	0.06	0.1	0.4	0.20	0.0	0.7
Right turn – Well House Lane to A629 Halifax Road (B-A)	0.47	1.0	0.4	0.21	0.3	0.7
Right turn – A629 Halifax Road to Well House Lane (C-AB)	0.03	0.0	5.7	0.20	0.0	4.3

8.2.3 A Ratio of Flow to Capacity (RFC) value below 0.85 indicates that a junction or arm is operating within spare capacity. An RFC value between 0.85 and 1.00 indicates that there may be occasions during the period modelled when queues will develop, and delays will occur. An RFC value greater than 1.00 indicates that the junction or arm is operating beyond its theoretical capacity.

8.2.4 The junction has then been modelled for the AM and PM 2030 Base and Design scenarios and the results are summarised in Tables 8.2 and 8.3.

Table 8.2 A629 Halifax Road / Well House Lane – 2030 Base PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Left turn – Well House Lane to A629 Halifax Road (B-C)	0.07	0.1	0.02	0.0
Right turn – Well House Lane to A629 Halifax Road (B-A)	0.57	1.4	0.31	0.4
Right turn – A629 Halifax Road to Well House Lane (C-AB)	0.04	0.0	0.03	0.0

Table 8.3 A629 Halifax Road / Well House Lane – 2030 Design PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Left turn – Well House Lane to A629 Halifax Road (B-C)	0.08	0.1	0.0	0.03
Right turn – Well House Lane to A629 Halifax Road (B-A)	0.58	1.5	0.5	0.31
Right turn – A629 Halifax Road to Well House Lane (C-AB)	0.04	0.0	0.0	0.02

8.2.5 The results in Table 8.1 demonstrate that the junction currently operates with significant spare capacity and minimal queues and delay. Even with the addition of general traffic growth to a Design Year of 2030, which represents the full Opening Year for the proposed development, and the traffic predicted to be generated by the development, the junction will continue to operate with significant spare capacity with RFC values well below 0.85, minimal queuing and delay.

8.2.6 No mitigation is therefore required at the existing A629 Halifax Road / Well House Lane priority junction.

A628 Barnsley Road / Well House Lane / Water Hall Lane Priority Staggered Cross Road Junction

8.2.7 This priority staggered cross road junction has also been modelled using the PICADY 9 Priority Intersection module in the TRL software, Junctions 9. The existing layout of the junction is shown in Figure 8 and the junction has initially been modelled for the 2018 existing weekday AM and PM peak hours. The results of the modelling are summarised in Table 8.4.

Table 8.4 A629 Halifax Road / Well House Lane / Water Hall Lane – 2018 Existing PICADY Results

Movement	AM Peak Hour			PM Peak Hour		
	RFC	Mean Queue	Recorded Queue	RFC	Mean Queue	Recorded Queue
Water Hall Lane (B-ACD)	0.03	0.0	0.0	0.00	0.0	0.7
A628 Barnsley Road (E) (A-BCD)	0.01	0.0	0.3	0.01	0.0	0.0
Well House Lane (D-ABC)	0.35	0.5	2.7	0.35	0.6	4.7
A628 Barnsley Road (W) (C-ABD)	0.00	0.0	0.3	0.00	0.0	0.3

8.2.8 The junction has then been modelled for the AM and PM 2030 Base and Design scenarios and the results are summarised in Tables 8.5 and 8.6.

Table 8.5 A629 Halifax Road / Well House Lane / Water Hall Lane – 2030 Base PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Water Hall Lane (B-ACD)	0.05	0.1	0.00	0.0
A628 Barnsley Road (E) (A-BCD)	0.01	0.0	0.01	0.0
Well House Lane (D-ABC)	0.36	0.6	0.42	0.8
A628 Barnsley Road (W) (C-ABD)	0.00	0.0	0.00	0.0

Table 8.6 A629 Halifax Road / Well House Lane / Water Hall Lane – 2030 Design PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Water Hall Lane (B-ACD)	0.04	0.0	0.00	0.0
A628 Barnsley Road (E) (A-BCD)	0.06	0.1	0.08	0.1
Well House Lane (D-ABC)	0.66	2.0	0.55	1.3
A628 Barnsley Road (W) (C-ABD)	0.00	0.0	0.00	0.0

8.2.9 The results in Table 8.4 demonstrate that the junction currently operates with significant spare capacity and minimal queues and delay. Even with the addition of general traffic growth to a Design Year of 2030, which represents the full Opening Year for the proposed development, and the traffic predicted to be generated by the development, the junction will continue to operate with significant spare capacity with RFC values well below 0.85, minimal queuing and delay.

8.2.10 No mitigation is therefore required at the existing A629 Halifax Road / Well House Lane / Water Hall Lane priority staggered cross road junction.

A628 Barnsley Road / B6462 Huddersfield Road Priority Junction

8.2.11 This priority junction has also been modelled using the PICADY 9 Priority Intersection module in the TRL software, Junctions 9. The layout of the junction is shown in Figure 9 and it can be seen that the left turning traffic from A628 Barnsley Road into B6462 Huddersfield Road gives way to traffic that has turned right into the junction from Barnsley Road. The junction has therefore been modelled in two parts to reflect this. The junction has initially been modelled for the 2018 existing weekday AM and PM peak hours and the results of the modelling are summarised in Table 8.7.

Table 8.7 A628 Barnsley Road / B6462 Huddersfield Road – 2018 Existing PICADY Results

Movement	AM Peak Hour			PM Peak Hour		
	RFC	Mean Queue	Recorded Queue	RFC	Mean Queue	Recorded Queue
Left turn – B6462 Huddersfield Road to A628 Barnsley Road (B-C)	0.16	0.2	1.3	0.08	0.1	0.7
Right turn – B6462 Huddersfield Road to A628 Barnsley Road (B-A)	0.47	1.0	9.7	0.52	1.2	9.7
Right turn – A628 Barnsley Road to B6462 Huddersfield Road (C-AB)	0.20	0.3	3.0	0.02	0.0	0.3

8.2.12 The junction has then been modelled for the AM and PM 2030 Base and Design scenarios and the results are summarised in Tables 8.8 and 8.9.

Table 8.8 A628 Barnsley Road / B6462 Huddersfield Road – 2030 Base PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Left turn – B6462 Huddersfield Road to A628 Barnsley Road (B-C)	0.22	0.3	0.11	0.1
Right turn – B6462 Huddersfield Road to A628 Barnsley Road (B-A)	0.60	1.6	0.62	1.7
Right turn – A628 Barnsley Road to B6462 Huddersfield Road (C-AB)	0.23	0.3	0.02	0.0

Table 8.9 A628 Barnsley Road / B6462 Huddersfield Road – 2030 Design PICADY Results

Movement	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
Left turn – B6462 Huddersfield Road to A628 Barnsley Road (B-C)	0.21	0.3	0.10	0.1
Right turn – B6462 Huddersfield Road to A628 Barnsley Road (B-A)	0.58	1.4	0.63	1.8
Right turn – A628 Barnsley Road to B6462 Huddersfield Road (C-AB)	0.22	0.3	0.02	0.0

8.2.13 The results in Table 8.7 demonstrate that the junction currently operates with spare capacity and minimal queues and delay. Even with the addition of general traffic growth to a Design Year of 2030, which represents the full Opening Year for the proposed development, and the traffic predicted to be generated by the development, the junction will continue to operate with spare capacity with RFC values well below 0.85, minimal queuing and delay.

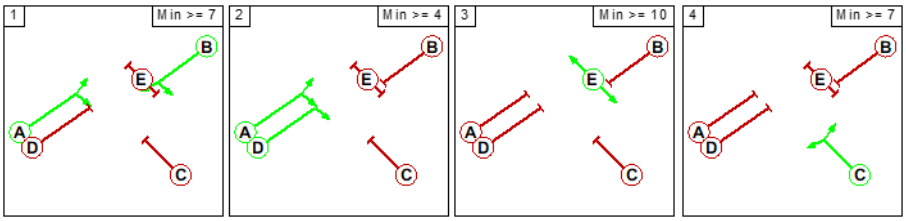
8.2.14 No mitigation is therefore required at the existing A628 Barnsley Road / B6462 Huddersfield Road priority junction.

A628 Barnsley Road / B6462 Bridge Street / A628 Thurlstone Road Traffic Signal Controlled Junction

8.2.15 The existing layout of this traffic signal controlled junction is shown in Figure 10 and it has been modelled using LinSig v3.2 software. The junction model has been calibrated using on site observations, recorded saturation flows, BMBC signal data and recorded queue information.

8.2.16 The junction operates on MOVA control with stages demand dependent (as such all models have been optimised). The average cycle length is typically 120 seconds including the pedestrian crossing phase. The signal stages are shown in Image 8.1.

Image 8.1 A628 / B6462 Bridge Street - Signal Stage Diagrams



8.2.17 The junction has been modelled for the 2018 existing weekday AM and PM peak hours and the results are summarised in Table 8.10.

Table 8.10 A628 / B6462 Traffic Signal Controlled Junction – 2018 Existing LinSig Results

Lane	AM Peak Hour			PM Peak Hour		
	DoS (%)	MMQ	Obs Queue	DoS (%)	MMQ	Obs Queue
A628 Barnsley Road Left/Ahead	77.8	17	10	90.6	27	12
B6462 Bridge Street Right/Left	78.7	17	16	91.1	21	19
A628 Thurlstone Road Ahead/Right	64.3	13	13	71.2	6	10

8.2.18 A Degree of Saturation (DoS) value below 90% indicates that a signalised junction is operating within its desirable practical capacity. A DoS value between 90% and 100% indicates that there are likely to be occasions during the period modelled when queues will develop, and delays will occur. A DoS value greater than 100% indicates that the junction or arm operates beyond its theoretical capacity with an associated increase in queuing and delay within that specified time period.

8.2.19 It can be seen from the summary results contained in Table 8.10 that the junction operates within the desired practical capacity (90% DoS) on all approaches in the AM peak hour and is operating slightly above its desirable practical reserve capacity in the PM peak hour.

8.2.20 The majority of modelled queues are slightly higher than those recorded on site by an independent survey company and therefore the model is deemed to be providing a robust assessment of the existing situation.

8.2.21 The junction has then been modelled for the AM and PM 2030 Base and Design scenarios and the results are summarised in Tables 8.11 and 8.12.

Table 8.11 A628 / B6462 Traffic Signal Controlled Junction – 2030 Base LinSig Results

Lane	AM Peak Hour		PM Peak Hour	
	DoS (%)	MMQ	DoS (%)	MMQ
A628 Barnsley Road Left/Ahead	89.2	22	100.5	43
B6462 Bridge Street Right/Left	89.0	24	100.3	31
A628 Thurlstone Road Ahead/Right	73.2	16	95.2	12

Table 8.12 A628 / B6462 Traffic Signal Controlled Junction – 2030 Design LinSig Results

Lane	AM Peak Hour		PM Peak Hour	
	DoS (%)	MMQ	DoS (%)	MMQ
A628 Barnsley Road Left/Ahead	89.6	23	104.3	54
B6462 Bridge Street Right/Left	89.5	24	101.7	35
A628 Thurlstone Road Ahead/Right	71.4	16	95.2	13

8.2.22 The results summarised in Table 8.11 demonstrate that as a result of general traffic growth the junction will be slightly over capacity in the PM peak hour whilst still operating within practical reserve capacity in the AM peak hour. With the addition of the traffic predicted to be generated by the proposed development the situation will slightly worsen, as shown in Table 8.12.

8.2.23 Taking the worse case PM peak hour and examining the additional traffic at the junction in 2030 as a result of the proposed development (see Figure 122), there will be an additional 24 trips on the B6462 Bridge Street arm, 14 additional trips on the A628 Thurlstone Road arm and 13 on the A628 Barnsley Road arm. This is an increase of 4% on B6462 Bridge Street, 3% on A628 Thurlstone Road and 2% on A628 Barnsley Road.

8.2.24 This level of increase in traffic which will amount to one additional vehicle on each arm every 3 minutes or less will be imperceptible over and above the normal fluctuations in daily traffic flows and therefore cannot be classed as a material impact.

Hoylandswaine Roundabout

8.2.25 The roundabout has been modelled using the ARCADY 9 Roundabout module of the TRL software, Junctions 9. Roundabouts are modelled using the well-established TRL/Kimber capacity relationships which take into account key roundabout geometries such as entry width, approach width, flare length, conflict angle, inscribed circle diameter and entry radius. The empirical framework intrinsically links roundabout geometry to driver behaviour and in turn to predict capacities, queues and delays.

8.2.26 The existing layout of the junction is shown in Figure 11 and the junction has initially been modelled for the 2018 existing weekday AM and PM peak hours. The results of the modelling are summarised in Table 8.13.

Table 8.13 Hoylandswaine Roundabout – 2018 Existing ARCADY Results

Arm	AM Peak Hour			PM Peak Hour		
	RFC	Mean Queue	Recorded Queue	RFC	Mean Queue	Recorded Queue
A628 Barnsley Road (N)	0.42	0.8	4.0	0.56	1.4	4.3
A629 High Lee Lane	0.37	0.6	5.3	0.35	0.6	6.3
A628 Barnsley Road (S)	0.63	1.9	7.7	0.43	0.8	6.0
A629 Halifax Road	0.56	1.4	6.7	0.31	0.5	5.0

8.2.27 The roundabout has then been modelled for the AM and PM 2030 Base and Design scenarios and the results are summarised in Tables 8.14 and 8.15.

Table 8.14 Hoylandswaine Roundabout – 2030 Base ARCADY Results

Arm	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
A628 Barnsley Road (N)	0.48	1.0	0.63	1.8
A629 High Lee Lane	0.42	0.8	0.41	0.8
A628 Barnsley Road (S)	0.73	2.9	0.49	1.1
A629 Halifax Road	0.65	2.0	0.36	0.6

Table 8.15 Hoylandswaine Roundabout – 2030 Design ARCADY Results

Arm	AM Peak Hour		PM Peak Hour	
	RFC	Mean Q	RFC	Mean Q
A628 Barnsley Road (N)	0.53	1.2	0.71	2.7
A629 High Lee Lane	0.46	0.9	0.49	1.1
A628 Barnsley Road (S)	0.79	4.0	0.54	1.3
A629 Halifax Road	0.76	3.4	0.39	0.7

8.2.28 The results in Table 8.13 demonstrate that the roundabout currently operates with spare capacity and minimal queues and delay. Even with the addition of general traffic growth to a Design Year of 2030, which represents the full Opening Year for the proposed development, and the traffic predicted to be generated by the development, the roundabout will continue to operate with spare capacity with RFC values well below 0.85, minimal queuing and delay.

8.2.29 No mitigation is therefore required at the existing Hoylandswaine Roundabout.

8.3 PROPOSED ACCESS JUNCTION ASSESSMENTS

A628 Halifax Road Access

8.3.1 The layout of the proposed A628 Halifax Road Access junction is described in Section 4 and shown on the drawing in Appendix F.

8.3.2 The junction has been modelled using the PICADY module within the Junctions 9 software for the 'with development' 2030 Design scenario. The results for the AM and PM peak hour periods are summarised in Table 8.16.

Table 8.16 Proposed A628 Halifax Road Site Access Junction 2030 Design Scenario

Movement	AM		PM	
	RFC	Av Q (pcu)	RFC	Av Q (pcu)
B-C Left turn from Site Access on to A628 Halifax Road	0.03	0.0	0.01	0.0
B-A Right turn from Site Access on to A628 Halifax Road	0.27	0.4	0.09	0.1
C-AB Right turn from A628 Halifax Road into Site Access	0.02	0.0	0.03	0.0

8.3.3 A Ratio of Flow to Capacity value below 0.85 indicates that a junction or arm operates within its predicted capacity. An RFC value between 0.85 and 1.00 indicates that there may be occasions during the period modelled when queues will develop, and delays will occur. An RFC value greater than 1.00 indicates that the junction or arm operates beyond its theoretical capacity.

8.3.4 The results demonstrate that the proposed junction will operate comfortably within capacity during both the AM and PM peak hour periods in the 2030 Design scenario accommodating the traffic generated by 460 dwellings.

Well House Lane Access

8.3.5 The layout of the proposed Well House Lane Access junction is described in Section 4 and shown on the drawing in Appendix G.

8.3.6 The junction has been modelled using the PICADY module within the Junctions 9 software for the 'with development' 2030 Design scenario. The results for the AM and PM peak hour periods are summarised in Table 8.17.

Table 8.17 Proposed Well House Lane Site Access Junction 2030 Design Scenario

Movement	AM		PM	
	RFC	Av Q (pcu)	RFC	Av Q (pcu)
B-C Left turn from Site Access on to Well House Lane	0.06	0.1	0.02	0.0
B-A Right turn from Site Access on to Well House Lane	0.16	0.2	0.06	0.1
C-AB Right turn from Well House Lane into Site Access	0.04	0.1	0.08	0.1

8.3.7 The results demonstrate that the proposed junction will operate comfortably within capacity during both the AM and PM peak hour periods in the 2030 Design scenario accommodating the traffic generated by 460 dwellings.

9. Summary and Conclusions

9.1 SUMMARY

9.1.1 This Transport Assessment has been prepared by Optima Highways and Transportation Ltd to consider the highways and transportation matters associated with a proposed residential development on land to the south of Halifax Road in Penistone.

9.1.2 The TA has been prepared to accompany a full planning application for the construction of up to 459 dwellings including access, landscaping and areas of public open space (POS).

9.1.3 The general scope of the TA has been discussed and agreed in principle with BMBC during pre-application engagement.

9.1.4 The vehicular access into the proposed development will be via a priority junction on A629 Halifax Road with another simple priority junction on Well House Lane. Pedestrians and cyclists will be able to access the development from both Halifax Road and Well House Lane and, on Well House Lane, there will be an additional pedestrian/cycle access further to the south of the vehicular access.

9.1.5 Analysis has demonstrated that this form of junction is suitable to serve the level of development proposed and each will operate with significant spare capacity at the full Opening Year of 2030 and beyond. The junction on A629 Halifax Road has been designed in accordance with DMRB CD 123 'Geometric design of at-grade priority and signal-controlled junctions'.

9.1.6 This report has provided a commentary on the Site and its existing conditions. It has demonstrated that the Site is accessible by foot, cycle and public transport to numerous local facilities and employment opportunities. In accordance with the NPPF, this provides future residents with the choice to travel via alternatives modes of transport and minimise trips made by the private car. Furthermore, the additional use of these facilities by the residents at proposed development e.g. public transport and the local commerce, will assist in supporting and sustaining them.

9.1.7 A review of the personal injury collision data has been undertaken for the study area, which has shown that there are no specific accident concerns and it is considered that the proposed development will not materially exacerbate the existing highway safety situation.

9.1.8 Junction capacity assessments have been undertaken across the local highway network using industry standard software for a development Design Year of 2030. The capacity assessments have demonstrated that the majority of the junctions in the study area are operating well within capacity in the Base and Design scenarios and as such the impact of the development will be accommodated.

9.1.9 The junction of A628 / B6462 Bridge Street has been shown to be just over-capacity in the PM peak hour as a result of general traffic growth alone. The amount of additional traffic as a result of the proposed development is not considered to be material as it will be imperceptible over and above the usual daily fluctuations in peak hour traffic flows.

9.2 CONCLUSIONS

9.2.1 This Transport Assessment has demonstrated that safe and suitable access to the proposed development can be achieved for all users and that there will be no unacceptable impacts from the development on the transport network or on highway safety.

9.2.2 It is therefore concluded that there are no reasons on highways or transport grounds why the development proposals should not be granted planning permission.