Transportation Planning : Infrastructure Design

TRANSPORT ASSESSMENT

PROPOSED RESIDENTIAL DEVELOPMENT
WILTHORPE ROAD BARNSLEY

PERSIMMON HOMES (YORKSHIRE) LTD

APRIL 2014

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1.0 INTRODUCTION

1.1 This Transport Assessment has been prepared by SCP on behalf of Persimmon Homes West Yorkshire to consider the traffic and transport implications of an outline planning application for a residential development at Wilthorpe Road, Barnsley.

1.2 The proposed development comprises residential uses on a site of approximately 13 ha of land. The scheme includes for 312 units.

1.3 The scope for this Transport Assessment has been agreed with the local Highway Authority, Barnsley Metropolitan Borough Council (BMBC). It has been prepared to appraise BMBC Highways of the likely transport implications of the development on the local highway network and the accessibility of the site on foot, cycle and public transport.

1.4 A public consultation event was held in March 2014 in relation to this application.

1.5 This Transport Assessment concludes that there is no traffic or highways related reason why outline planning permission should not be granted.

2.0 THE SITE

2.1 The site currently is used as open farmland at present. It is located on the northern side of A635, some 1.5 miles to the north-west of Barnsley town centre. It is bounded by a railway line to the north and to the west by the Redbook Business Park. To the east, it is bounded by another area of housing and to the north east by Wilthorpe Junior School. A beck runs along part of the eastern boundary of the site and then runs across the site to a culvert under the railway line

2.2 The site has a frontage onto A635 which is some 75m in length. At present, the A635 is higher than the adjacent site levels and the site falls away to the north and the railway line. There is presently no access on A635 Wilthorpe Road from this frontage.

2.3 A location plan of the site is shown at **Appendix 1**.

3.0 THE LOCAL HIGHWAY NETWORK

3.1 The site fronts onto A635 Wilmore Road. A635 is some 7.3m wide with footways to both sides. A635 is subject to a 30 mph speed limit along the site frontage. This changes to a 40 mph speed limit just to the west of the site.

3.2 This section of A635 is designated as a clearway which prohibits vehicles from stopping on-street from 8am – 6pm and loading taking place during the peak periods. This allows traffic to flow more freely during peak periods but still allows for overnight and daytime parking during off-peak periods.

3.3 To the east of the site, A635 forms a traffic signalled controlled crossroads junction with Rowland Road and Wilthorpe Farm Road. The eastbound arm on A635 has a two lane approach whilst the others arms have one lane approaches. There is a lay-by on the leaving side of the western approach to the junction to provide car parking for the adjacent houses.

3.4 Wilthorpe Farm Road provides access to a residential estate which lies to the east of the site. There is a route from Wilthorpe Farm Road through the estate via Wilthorpe Avenue onto Greenfoot Lane which then provides access to Wilthorpe Junior School, a Children's Centre and a playground and joins A635 at a simple priority junction. A public right of way continues from the northern end of Greenfoot Lane and passes under the railway line.

3.5 To the west of the site, a cul de sac called the Crescent meets A635 at a simple priority junction. This serves a car parts and servicing unit, a veterinary practice, a local tennis club and some residential properties. Redbrook Business Park lies further to the west and has a separate access from A635 by way of a ghost island junction although the road network within the estate is private

3.6 On the opposite side of A635 and to the west of the site frontage, Innovation Way forms a priority junction access with A635 and serves a business park. There is also a community centre with its own access opposite the site

4.0 ACCESSIBILITY

Walking

4.1 The site is close to local services and is in a sustainable location. The local services in the vicinity of the site are shown on the plan at **Appendix 2**.

4.2 Based on the 800m distance of a 'walkable neighbourhood' referred to in MfS, the development will be accessible to a number of sizeable employment facilities, a school, a children centre, community centre , two convenience stores, a post office and Barnsley Hospital.

4.3 The CIHT publication 'Guidelines for Providing for Journeys on Foot' gives guidance regarding acceptable walking distances. Within the 2000m referred maximum for commuting/school/sight seeing, the development is also within walking distance of the northern part of the town centre.

4.1 As well as the employment opportunities close to the site, there is good access into Barnsley for employment, leisure and education related trips, as well as access to bus and rail connections at Barnsley Interchange.

Cycling

4.2 It is recognised that cycling can be part of a longer journey by public transport or can replace car trips for shorter journeys. The town centre and all its facilities are within reach by cycle. Access to Barnsley Interchange is also convenient from the site by cycle and provides links to rail and bus service across the region.

Public Transport

4.3 There are bus stops in the vicinity of the Crescent to the west of the site frontage on both sides of A635 which have shelters and timetable displays. These bus stops are within the recommended 400m walking distance from the centre of the site. There also other bus stops within the close vicinity of the site on A635 to the east of the site.

4.4 The site is well served by bus services as it is on a radial route into Barnsley town centre. The 93 runs from Woolley whilst the 93A also runs from Mapplewell and Kexbrough. Both services serve Barnsley Hospital. These services run every 20 minutes from 06.20-22.54 Monday – Friday. They also operate from 07.20-22.22 on Saturday and 10.25-22.54 on a Sunday on an hourly frequency.

4.5 The 95 runs from Kexbrough and the 95A runs from Woolley. Whilst these service do not pass the site directly, they are accessible on foot from the site and offers the option of a different route into the town centre via Gawber.

4.6 Other services include the 96 which runs between Wakefield and Barnsley and the 97 which runs from Ingbirchworth via Denby Dale, Skelmanthorpe and High Hoyland into Barnsley. Both of these run on an hourly basis on Monday-Saturday with a reduced service on Saturday and Sunday.

4.7 The details of bus timetables and routes are attached at **Appendix 3**.

4.8 The site is therefore well served by a frequent and convenient bus service.

5.0 THE EXISTING OPERATION OF THE HIGHWAY NETWORK

5.1 Traffic surveys were undertaken in the morning and evening peak hours on Thursday 23rd January 2014 at the A635/Rowland Road/Wilthorpe Farm Road junction and A635/Innovation Way junction. The results are included at **Appendix 4**.

5.2 Personal Injury Accidents

5.3 The latest 5 year period for which accident data is readily available is from the beginning of 2008 until the end of 2012. During this period, on the length of A635 between the Crescent and the Wilthorpe Farm Road signals there have been 6 accidents, of which one was fatal, 2 two were serious and 3 were slight. This frequency is no greater than would normally be expected for an 'A' class route carrying the volume of traffic which A635 carries. It is therefore reasonable to assume that the adjacent highway network is operating safely at present.

6.0 THE PROPOSED DEVELOPMENT

6.1 A plan showing the proposed layout is included at **Appendix 5**.

6.2 The residential element will consist of 312 units. The content of the scheme will be subject to a reserved matters application in due course but is envisaged that it will principally comprise detached and semi-detached houses, terraced housing and apartment blocks of 2 or 2.5 storeys.

6.3 The scheme also provides public open space along the northern side of the site, along the line of the beck and adjacent to A635. A multi-use games area (MUGA) is also proposed in the north east corner of the site with a footpath link to the end of Greenfoot Lane where it is closed to vehicular traffic.

6.4 A Travel Plan accompanies the planning application and can be read in conjunction with this Transport Assessment.

Site Access

6.5 It is proposed to serve the development by a ghost island junction on A635. This will involve some widening to the carriageway which can be achieved using land along the site frontage. A plan showing the access layout and visibility splays is included at **Appendix 5**.

6.6 The access road into the development will be 5.5m wide with kerb radii of 6m.

6.7 The through lanes to the junction are proposed to be 3.65m in width at the request of BMDBC Highways in order to provide sufficient room for cyclists. The right turn lane will be 3.5m in width which accords with DMRB requirements at para 7.20 of TD42/95.

6.8 The proposed junction and the visibility splays themselves are all within the 30 mph speed limit. Also, the site access is located close to the Wilthorpe Farm Road signals which will serve to keep traffic speeds down. It is therefore considered that traffic speeds are likely to be no higher than 30 mph and hence Manual for Streets recommends that a visibility splay for a speed of 30 mph is 2.4m x 43m is required in both directions. The actual visibility splay to the left is 2.4m x 55m and that to the right is 2.4m x 73m, both of which exceed the requirements of MfS. The details of these visibilities are shown on the plan at **Appendix 6**.

7.0 TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

General

7.1 This chapter provides an estimate of the trips generated by the proposed land uses on the site, along with details of its distribution and assignment to the local highway network.

7.2 Whilst the development consists of 312 units, a figure of 330 units has been used for calculation purposes to give a robust, worst case assessment in this report.

Trip Generation – Proposed Development

7.3 To estimate the trip generating potential of the housing development, the TRICS 7.1.1 database has been interrogated for surveys of residential developments similar to that proposed. The selection criteria for the residential TRICS-based trip rates are as follows:

- Land use - Residential - Houses Privately Owned;
- England sites only;
- Multi Model Trip Rates;
- Weekday surveys; and
- Range – Housing - 52-372 units.

7.4 The multi-modal TRICS outputs for the residential elements are presented in **Appendix 6** and are summarised in Table 7.1.

Table 7.1 - Trip Rates (per unit) Associated with Residential Development

Mode	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Vehicles	0.161	0.403	0.390	0.236
Cyclists	0.005	0.017	0.017	0.012
Pedestrians	0.042	0.186	0.070	0.047
Public Transport	0.008	0.025	0.016	0.004

Source: TRICS 7.1.1

7.5 The numbers of multi-modal trips estimated to be generated by the proposed development of 330 dwellings is summarised in Table 7.2.

Table 7.2 – Estimated Trips Associated with Residential Development (330 dwellings)

Mode	Weekday AM Peak (08:00 to 09:00)		Weekday PM Peak Hour (17:00 to 18:00)	
	Arrivals	Departures	Arrivals	Departures
Vehicles	53	133	129	78
Cyclists	2	6	6	4
Pedestrians	14	61	23	16
Public Transport	3	8	5	1

7.6 The proposed development is therefore anticipated to generate 186 trips on the local highway network in the morning peak and 207 trips in the evening peak. This equates around 3 vehicles per minute on average during the morning and evening peaks..

Trip Distribution

7.7 The trip distribution methodology for the proposed development traffic is based on the existing traffic flows and is set out in Table 7.3 below.

Table 7.3 – Trip Distribution

'IN' movements	'OUT' movements
60% in from Wilthorpe Road (east)	60% out to Wilthorpe Road (east)
40% in from Wilthorpe Road (west)	40% out to Wilthorpe Road (west)

7.8 The trip distribution and the assignment of development traffic for the AM and PM peak hours is shown on the diagrams at **Appendix 7**.

8.0 HIGHWAY IMPACT

Introduction

8.1 This chapter describes the impact of the additional trips generated by the proposed development on the operation of the local highway network.

Background Traffic Flows and Growth

8.2 As stated previously, a traffic survey was undertaken at Wilthorpe Road / Innovation Way priority junction, to the west of the development site as well as Wilthorpe Road / Wilthorpe Avenue / Rowland Road signalised junction to the east of the site. The peak hours have been confirmed as 08:00 to 09:00 hours and 16:30 to 17:30.

8.3 In accordance with the advice in the DfT's *"Guidance on Transport Assessment"* document, a future assessment year of 2019 has been assessed which is equal to the year of application plus 5 years.

8.4 In order to quantify the level of background traffic growth that could occur on the local network between the 2014 survey data and the 2019 future assessment year, National Traffic Model (NTM) growth factors, modified by TEMPRO local growth factors for the Barnsley area, have been used.

8.5 The resulting traffic growth factors between 2014 and 2019 are 1.0575 in the morning peak period and 1.0593 in the evening peak period.

8.6 The 'without development' traffic flows in 2019 are illustrated at **Appendix 8**.

8.7 The 'with development' traffic flows are the sum of the 2019 'without development' traffic flows and the assigned development traffic flows, which are illustrated in **Appendix 9**.

Junction Capacity Tests

Site Access / Wilthorpe Road

8.8 An assessment of the proposed site access with Wilthorpe Road has been carried out using Junctions 8 (PICADY) software which includes for the modelling of the introduction of a right turn ghost island for vehicles turning into the development site from the east.

8.9 With the Junctions 8 models, the results generated provide a Ratio to Flow capacity (RFC) along with an estimate of the likely traffic queues. RFC values between 0.00 and 0.85 are generally accepted as representing stable and acceptable operating conditions. Values between 0.85 and 1.00 represent variable operation with the possibility of queues building up at the junction during the period under consideration and increases in vehicular delay through the junction. RFC values predicted in excess of 1.00 represents overloaded conditions i.e. congestion.

8.10 A detailed output from the PICADY assessment for the scenario of 2019 'with development' flows for the junction is provided at **Appendix 10**, whilst Table 8.1 provides a summary of the results.

Table 8.1 – Proposed Site Access / Wilthorpe Road – 2019 'With Development' Results

Junction / Movement	AM		PM	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access	0.51	1.0	0.34	0.5
Wilthorpe Road S (Right Turn)	0.08	0.1	0.18	0.2

Note: RFC = Ratio of Flow to Capacity – normal design max. RFC = 0.850

8.11 The predicted maximum RFC values, for the AM and PM peak periods, are significantly below the 0.85 threshold typically accepted as being representative of a junction at its practical capacity threshold. Queue lengths of one vehicle in length are acceptable. Therefore the proposed site access is forecast to easily accommodate the development related traffic in the design year of 2019.

Innovation Way / Wilthorpe Road

8.12 In addition to evaluating the proposed site access for a future year of 2019, the junction of Innovation Way / Wilthorpe Road has also been assessed for 2019 'with development' flows using PICADY software within the Junctions 8 programme.

8.13 A detailed output from the PICADY assessment for the scenario of 2019 'with development' flows for the junction is provided at **Appendix 11**, whilst Table 8.2 provides a summary of the results.

Table 8.2 – Innovation Way / Wilthorpe Road – 2019 'With Development' Results

Junction / Movement	AM		PM	
	RFC	Queue (PCU)	RFC	Queue (PCU)

Innovation Way	0.13	0.2	0.38	0.6
Wilthorpe Road N (Right Turn)	0.07	0.1	0.02	0.0

Note: RFC = Ratio of Flow to Capacity – normal design max. RFC = 0.850

8.14 The above results clearly show that the Innovation Way / Wilthorpe Road priority junction will also operate well within capacity in the future assessment year of 2019 with the proposed development in place, with minimal queuing and delay.

Wilthorpe Farm Road / A635 / Rowland Road

8.15 The signalised junction of Wilthorpe Farm Road, A635 and Rowland Road has been assessed using LinSig software.

8.16 The outputs for 2019 Base plus Development traffic scenarios are included in full at **Appendix 12**. The results are summarised in the Table 8.3.

Table 8.3: 2019 Base plus Development

Link Ref	Link Description	AM Peak		PM Peak	
		DOS (%)	Queue	DOS (%)	Queue
1/1	Wilthorpe Road (E) - Left Ahead Right	47.1	7	66.9	14
2/1	Rowland Road - Right Left Ahead	64.4	5	67.1	6
3/1	Wilthorpe Road (W) - Ahead Right Left	68.4	13	67.9	14
4/1	Wilthorpe Avenue - Left Ahead Right	41.5	3	13.4	1
Cycle Time (seconds)		90		90	
PRC Over All Lanes (%)		31.6		32.6	
Total Delay Over All Lanes (PCUHr)		8.12		9.74	

DOS – Degree of Saturation; Queue – Mean Max Queue (Passenger Car Units (PCUs))

8.17 The results demonstrate that the junction will operate with significant spare capacity of the order of 32% in 2019 for both the AM and PM peak periods with the development related traffic and traffic growth taken into account.

Conclusion

8.18 Overall it has been demonstrated that the proposed site access would have sufficient capacity to accommodate the proposed development traffic with minimal levels of delay or queuing.

8.19 The off-site junctions in either direction along A635 have also been assessed for the design year of 2019 with the inclusion of the development

traffic and it has been demonstrated that they will continue to operate with significant spare capacity.

8.20 Therefore it is concluded that there are no highway capacity reasons why this development should not be permitted.

9.0 SUMMARY AND CONCLUSIONS

9.1 This Transport Assessment has considered the traffic and transport issues arising as a result of proposals for a residential development of some 312 houses at a site on the northern side of A635 Wilthorpe Road, Barnsley. The scheme also has benefits in terms of the public open space and multi-use games area which it will provide.

9.2 The site has the benefit of good access to local facilities and is served by a hourly bus service which is within walking distance of the site. It is therefore in a sustainable location and close to other existing residential development.

9.3 Access to the site will be by way of a ghost island priority junction on to A635. Visibility from this junction accords with the recommendations of Manual for Streets.

9.4 It has been demonstrated the site access, the Wilthorpe Farm Road/ Rowland Road junction to the east and the Innovation Way junction to the west will have ample capacity to accommodate the development generated traffic.

9.5 It is therefore concluded that there are no traffic or highways related reasons to withhold permission for the proposed development.