SCP

Transportation Planning : Infrastructure Design

Transport Assessment

Proposed Residential Development

Carrs Lane, Cudworth

Barratt Homes and David Wilson Homes

October 2015

Doc Ref: GWB/14923/TA/01

Prepared by:	T Harrigan
Checked by:	G W Bowman

Document Revision Control

Revision	Date	Status	Prepared By	Approved By
-	08/10/15	Final	TH	GWB

Riverside Studio
32 The Calls
Leeds
LS2 7EW

T: 0113 887 3323
F: 0161 832 5111

E: info@scptransport.co.uk
W: www. scptransport.co.uk

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of SCP being obtained. SCP accepts no responsibility or liability for the consequence of this document being used for a purpose other than the purposes for which it was commissioned. Any person using or relying on the document for such other purposes agrees and will by such use or reliance be taken to confirm his agreement to indemnify SCP for all loss or damage resulting there from. SCP accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned.

CONTENTS

1.0 INTRODUCTION 3
2.0 THE SITE AND THE LOCAL HIGHWAY NETWORK 4
3.0 ACCESSIBILITY 7
4.0 EXISTING OPERATION OF THE LOCAL HIGHWAY NETWORK 12
5.0 THE PROPOSED DEVELOPMENT 16
6.0 TRIP GENERATION 20
7.0 TRAFFIC IMPACT ASSESSMENT 22
8.0 SUMMARY AND CONCLUSIONS 27

Appendices

1 Site Location Plan
2 Local Highway Network
3 Local Facilities Plan
4 Public Rights of Way
5 5km Cycle Catchment and Local Cycle Routes
6 Public Transport Facilities
7 Traffic Flow Diagrams: Existing Peak Hour Traffic Flows
8 Junctions 9 Output Files: Newlands Avenue / Newton Avenue
9 Junctions 9 Output Files: Carrs lane / White Cross Road / Lunn Road
10 Junctions 9 Output Files: Barnsley Road / Manor Road
11 Junctions 9 Output Files: Manor Road / Newlands Avenue
12 Junctions 9 Output Files: Barnsley Road / St John's Road
13 Personal Injury Accidents
14 Proposed Site Layout
15 Site Access Visibility Splays (Carrs Lane)
16 Swept Path Assessment for Large Refuse Vehicle
17 TRICS Output Files (Existing Uses)
18 NOMIS Traffic Distribution Calculations
19 Traffic Flow Diagrams: Assigned Development Flows
20 Traffic Growth Calculations (TEMPRO)
21 Traffic Flow Diagrams: 2020 Growthed Traffic Flows
22 Traffic Flow Diagrams: Committed Development Traffic Flows
23 Traffic Flow Diagrams: 2020 Baseline Traffic Flows
24 Traffic Flow Diagrams: 2020 Baseline Plus Development Traffic Flows

1.0 INTRODUCTION

1.1 This Transport Assessment has been prepared by SCP on behalf of Barratt Homes to consider the traffic and transport implications of a planning application for a residential development at Carrs Lane, Cudworth near Barnsley.

1.2 The proposed development comprises of a residential scheme of some 278 units to be accessed by way of Newland Avenue and Carrs Lane.

1.3 The applicant has engaged with the local Highway Authority, Barnsley Metropolitan Borough Council (BMBC), through the pre-application process and has agreed the scope of this document with officers.

1.4 This Transport Assessment has been prepared to appraise the site in terms of the likely transport implications of the development on the local highway network and the accessibility of the site by sustainable modes including walking, cycling and by public transport.

1.5 It describes the local highway network and its operation and shows that it is operating safely at present. It then estimates the traffic likely to be generated by the development, distributes it to the local highway network and assesses its impact.

1.6 The Transport Assessment concludes that there is no traffic or highways related reason why planning permission should not be granted for this scheme.

1.7 The remainder of the report is structured as follows:

- **Section 2** describes the site and existing local highway network;
- **Section 3** considers access to the site by sustainable modes of transport;
- **Section 4** describes the operation of the existing highway network;
- **Section 5** outlines the development proposals;
- **Section 6** determines the traffic impact of the proposals on the local highway network; and
- **Section 7** provides a summary to the report and sets out the conclusions.

2.0 THE SITE AND THE LOCAL HIGHWAY NETWORK

The Site

2.1 The site is located on the western side of Carrs Lane, Cudworth and lies some 4 miles to the east of Barnsley town centre. It is presently used for agricultural purposes.

2.2 The site is roughly triangular in shape and covers an area of some 11.62 hectares. It is bounded to the east by Carrs Lane, to the south and west by a disused railway line and to the north by a number of dwellings which are served off Newland Avenue, Summerdale Road and Newtown Avenue.

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

The Local Highway Network

2.4 A plan of the local highway network is shown at **Appendix 2**.

2.5 Carrs Lane is a single carriageway road which lies to the east of the site and which is subject to a 30mph speed limit. It runs on an approximate north-south alignment from its junction with White Cross Road and Lunn Road at its northern end. It is separated from the site by a line of dwellings along its western side which all have direct access onto Carrs Lane. Similarly, there are dwellings along the eastern side of Carrs Lane which also have direct access on to Carrs Lane. At the southern end of the site, Carrs Lane forms a junction with Sunny Bank Drive which is a cul-de sac serving some residential properties. Carrs Lane then continues in a southerly direction until it terminates at the access to a water treatment plant and South Yorkshire Police stables at its southern end.

2.6 In the vicinity of the site, Carrs Lane in generally 5.6m wide. It is lit and is subject to a 30mph speed limit. The South Yorkshire Residential Design Guide recommends that a residential street with a speed limit of more than 20 mph should have a road width of a minimum of 5.5m and hence Carrs Lane meets this requirement, especially as Carrs Lane is not a bus route. This will allow two private cars to pass in comfort whilst two refuse or commercial vehicles will also be able to pass. Manual for Streets (MfS) also considers that a road of this width is capable of allowing all vehicles to pass each other with an overall tolerance of 0.5m for the largest vehicles but with ample clearance for all other vehicles.

2.7 There is a 2m wide footway along the majority of the eastern side of Carrs Lane which extends northwards from Sunny Bank Drive. There is also a footway on the western side of Carrs Lane along the majority of the site frontage which links into the footway network to the north.

2.8 Towards its northern end, Carrs Lane is joined from the east by two residential roads which link to a road called Low Cudworth which is a cul de sac.

2.9 Further to the north, the eastern footway reduced to a width of 0.3m and the western footway reduces to a width of 0.5m. This narrowing occurs over a relatively short length but clearly footway widths of this order are less than the 2.0 m recommended by the South Yorkshire Residential Guide and are insufficient for two pedestrians to pass.

2.10 At its northern end, Carrs Lane forms a simple priority junction at which northbound vehicles on Carrs Lane must give way. Lunn Road approaches this junction from the north and bends to the east where it runs into White Cross Road.

2.11 White Cross Road is a single carriageway road of some 7.5m in width. At its eastern end it forms the minor arm approach to a priority junction with Snydale Road and Darfield Road. It is lit has 2m wide footways on both sides of the carriageway and is subject to a 30mph speed limit.

2.12 Lunn Road runs from its junction with Carrs Lane and White Cross Road in a northerly direction. Again, the carriageway is approximately 7.5m wide, is lit and has footways of approximately 2m to 3m width on both sides of the carriageway. Lunn Road runs in to St John Road which provides direct access to the centre of Cudworth via Barnsley Road.

2.13 Midway along its length Lunn Road forms a priority junction with Manor Road on its western side. Manor Road links to Barnsley Road at its western end. It has a carriageway width of approximately 7.5m, is lit, has footways generally in excess of 2m width on both sides of the carriageway and is subject to a 30mph speed limit.

2.14 Newland Avenue runs south from Manor Road. It forms a roundabout with Newtown Ave to the south of which is a cul-de-sac which terminates at the site boundary. It is 7.3 wide with footways and wide grass verges to both sides.

2.15 Barnsley Road is the main route leading through the centre of Cudworth. It is a single carriageway road of some 7.3m width, is lit and has wide footways on both sides of the carriageway. It is lit and is subject to a 30mph speed limit.

2.16 Towards its southern end, Barnsley Road is fronted by a number of terraced properties on both sides of the road. At its northern end, Barnsley Road provides access to a number of food and non-food retail outlets, services and facilities typical of a small district centre. A number of side roads emerge on to Barnsley Road. These junctions are typically priority junctions some of which have ghost islands to assist right turning vehicles.

2.17 The A628 Pontefract Road is the Cudworth and West Green By Pass. It runs to the north of Barnsley Road which avoids the need for through traffic to pass through the centre of Cudworth.

3.0 ACCESSIBILITY

Local Facilities

3.1 Many of the local facilities and services in the vicinity of the site are located within the centre of Cudworth which is 10 to 15 minute walk from the centre of the site via Carrs Lane or Newland Avenue. These facilities include:-

- A post office;
- The Cudworth Centre (Community Health Centre);
- Numerous food and non-food retail outlets;
- Legal and financial services;
- Banking; and
- Public houses, restaurants and fast food outlets.

3.2 These are supplemented by other facilities and schools which lie outside of the centre of Cudworth. Table 3.1 provides a list of nearby local facilities and services together with the approximate walk distances from the centre of the site along the existing footways and other pedestrian routes. These are also shown on the plan at **Appendix 3**.

Table 3.1 - Local Facilities

Facility	Walk Distance
Cudworth Town Centre including local facilities	800m – 1200m
Cudworth Churchfield Primary School	1000m
Birkwood Primary School	850m
Dorothy Hyman Stadium	750m
Co-op Supermarket	750m
Post Office (Darfield Road)	1.2km

Walking

3.3 A walking journey of up to 800m (approximately a 10 minute walk) is considered an acceptable for accessing local facilities and accords with the 'walkable neighbourhood' referred to in MfS. A

journey of up to 2km is considered a reasonable distance to walk in order to access education and to commute to places of work.

3.4 The plan at **Appendix 4** shows the public rights of way and in the vicinity of the site. By comparison with the local facilities it is clear that there are numerous pedestrian routes.

3.5 The pedestrian routes in the vicinity are typical of a residential area in that there are footways on both sides of the carriageway which benefit from dropped crossings and routes are lit and generally overlooked.

3.6 Of particular note are the routes towards Darfiled Road from Carrs Lane. Rather than pedestrians being required to take an indirect route to Darfield Road, there is a convenient pedestrian route via Sunny Bank Drive and Lakeland Close where a traffic free route connects to Field Drive from which access to the facilities on Darfield Road south of its junction with White Cross Lane can be gained. This route avoids the longer pedestrian route along Low Cudworth which suffers from steep gradients and no footway provision.

Cycling

3.7 It is recognised that cycling can be part of a longer journey by public transport or can replace shorter car trips of at least 5km.

3.8 A 5km cycle distance from the centre of the site is shown at **Appendix 5** and shows that cyclists access local areas including the centre of Cudworth.

3.9 There are traffic free cycle routes which are accessible from the southern end of Carrs Lane which provide access to the Trans Pennine Trail (NCN 67). From the NCN 67, there are numerous opportunities for cyclists to travel along traffic free and advisory with traffic cycle routes to major employment centres and also Barnsley town centre itself.

3.10 Within the locality of the site, cyclists are able to travel along the existing residential roads which are lightly trafficked and provide convenient routes to local facilities in the area.

3.11 The plan also included at **Appendix 5** also shows the local cycle routes in the vicinity of the site.

Public Transport

3.12 The plan at **Appendix 6** shows the locations of the bus stops within 400m walk distance from the site.

3.13 The nearest bus stops are located on Lunn Road and White Cross Road the north of the site and are both just over a 280m walk from the centre of the site.

3.14 There are numerous other bus stops within the wider area of the site and especially along the Barnsley Road adjacent to its junction with Manor Road. These are some 600m walk distance from the centre of the site and which are served by a wide range of routes and services.

3.15 The bus routes accessible from the stops on Lunn Road, White Cross Road, Barnsley Road and Darfield Road are summarised in Table 3.2.

Table 3.2: Accessible Bus Routes and Frequencies

Route No.	Route Description	Monday to Friday		Saturday		Sunday
		Day	Eve	Day	Eve	
26	**Wombwell - Barnsley** via Wombwell - Cudworth - Shafton – Brierley – Grimethorpe – Darfield -Barnsley Interchange	-	60 mins	-	60 mins	60 mins
27	**Wombwell - Barnsley** via Wombwell - Cudworth - Shafton – Brierley – Grimethorpe – Darfield -Barnsley Interchange	180 mins	-	180 mins	-	-
28 / 28A	**Barnsley - Pontefract** via Barnsley interchange – Lundwood – Cudworth – Shafton – Grimethorpe – South Kirkby – Upton - Pontefract	60 mins	60 mins	60 mins	60 mins	60 mins
29	**Barnsley - Pontefract** via Barnsley interchange – Lundwood – Cudworth – Shafton – Grimethorpe – South Kirkby – Upton - Pontefract	60 mins	-	60 mins	-	-
30 / 30A	**Barnsley - Pontefract** via Barnsley interchange – Lundwood – Cudworth – Shafton – Grimethorpe – South Kirkby – Upton - Pontefract	60 mins	120 mins	120 mins	120 mins	-

31	**Cudworth – Barnsley Interchange** via Barnsley interchange – Monk Bretton – West Green – Cudworth	60 mins	-	120 mins	-	-
32	**Cudworth - Barnsley** via Cudworth - Lundwood – Cundy Cross – Hoyle Mill – Barnsley Interchange	10 mins	60 mins	10 mins	60 mins	60 mins
34	**Shafton – Barnsley (circular)** via Barnsley Interchange – Monk Bretton - Lundwood – Cudworth - Shafton	60 mins	-	60 mins	-	-
35 / 35A	**Barnsley – South Elmsall** via Hemsworth – Brierley – Shafton – Cudworth – west Green – Barnsley Interchange	120 mins	-	120 mins	-	-
36 / 36B	**South Elmsall – Barnsley (circular)** via South Elmsall – South Kirkby – Hemsworth – Brierley – Shafton – Cudworth – West Green	120 mins	-	120 mins	-	-
37	**Barnsley – Hemsworth (circular)** via Barnsley interchange – Cundy Cross – Lundwood – Cudworth – Shafton – Grimethorpe - Hemsworth	60 mins	-	60 mins	-	-
38	**Barnsley – Grimethorpe Circular** via Grimethorpe - Shafton - Cudworth - Lundwood – Hoyle Mill – Barnsley Interchange	60 mins	-	-	-	-

3.16 The above shows that there are frequent bus services throughout the week and on a weekend which are accessible from the site. There are also interchange opportunities in Barnsley town centre which provide access to more local, regional and national destinations by bus or train. Bus travel is therefore a realistic option for commuting and shopping trips and as part of the longer journey by public transport.

Summary

3.17 It is considered that the site is well located in relation to local services, is well served by public transport and has good opportunities for travel on foot and by cycle. It is therefore clear that the site is located in a sustainable location.

4.0 EXISTING OPERATION OF THE LOCAL HIGHWAY NETWORK

Existing Traffic Flows

4.1 The junctions which needed to be assessed were agreed with BMBC. Manual classified traffic surveys were therefore carried out at the following junctions on Tuesday 9th June 2015:-

- Junction 1: Newtown Avenue / Newland Avenue - 3 arm roundabout;
- Junction 2: Carrs Lane / White Cross Road / Lunn Lane – 3 arm priority;
- Junction 3: Barnsley Road / Manor Road priority - 3 arm priority junction;
- Junction 4: Manor Road / Newland Avenue - 3 arm priority junction; and
- Junction 5: St John's Road / Barnsley Road - 3 arm priority junction.

Assessment Periods

4.2 The traffic survey results for the whole network were interrogated to identify the AM and PM network peak hour for assessment. These occurred between 08:00 - 09:00 and 17:00 - 18:00 respectively.

4.3 The existing traffic flows are shown on the diagrams included at **Appendix 7**.

Existing Analysis

4.4 The capacity of the existing junctions has been assessed using the TRL software Junctions 9 with the geometric parameters of the junctions being taken from Ordnance Survey maps.

4.5 The results provide a Ratio to Flow Capacity (RFC) along with an estimate of the likely traffic queues. RFC values below 0.85 are generally accepted as representing stable and satisfactory operating conditions. Values between 0.85 and 1.0 represent variable operation (i.e. possible continuous queues building up at the junction during the period under consideration and increases in vehicular delay). RFC values in excess of 1.0 represents overloaded conditions (i.e. congested conditions when continuous queuing is likely).

4.6 The results also provide details of the mean maximum queues (MMQ). These are measured in passenger carrying units (PCU's) which are given as the number of PCU's queuing on a particular approach to the junction

Junction 1: Newland Avenue / Newtown Avenue

4.7 Table 4.1 provides the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 8**.

Table 4.1: Junction Analysis; Newland Avenue / Newtown Avenue

Movement	2015 Existing			
	AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Newtown Avenue	0.07	0.1	0.10	0.1
Newland Avenue South	0.13	0.1	0.12	0.1
Newland Avenue North	0.13	0.2	0.18	0.2

Junction 2: Carrs Lane / White Cross Road / Lunn Road

4.8 Table 4.2 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 9.**

Table 4.2: Junction Analysis; Carrs Lane / White Cross Road / Lunn Road

Movement	2015 Existing			
	AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Carrs Lane left to Lunn Road	0.08	0.1	0.11	0.1
Carrs Lane right to White Cross Road	0.04	0.0	0.08	0.1
Lunn Road ahead to White Cross Road left to Carrs Lane	0.09	0.1	0.11	0.1

Junction 3: Barnsley Road / Manor Road

4.9 Table 4.3 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 10**.

Table 4.3: Junction Analysis; Barnsley Road / Manor Road

Movement	2015 Existing			
	AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Manor Road left and right turn to Barnsley Road	0.38	0.6	0.27	0.4
Barnsley Road South right turn into Manor Road ahead to Barnsley Road North	0.17	0.2	0.25	0.4

Junction 4: Manor Road / Newland Avenue

4.10 Table 4.4 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 11**.

Table 4.4: Junction Analysis; Manor Road / Newland Avenue

Movement	2015 Existing			
	AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Newland Avenue left turn to Manor Road west	0.12	0.1	0.09	0.1
Newland Avenue right turn to Manor Road east	0.09	0.1	0.10	0.1
Manor Road west ahead and right to Newland Avenue	0.11	0.1	0.18	0.2

Junction 5: Barnsley Road / St John's Road

4.11 Table 4.5 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 12**.

Table 4.5: Junction Analysis; Barnsley Road / St John's Road

Movement	2015 Existing			
	AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)
St John's Road left turn to Barnsley Road west	0.20	0.2	0.10	0.1
St John's Road right turn to Barnsley Road east	0.19	0.2	0.14	0.2
Barnsley Road west ahead and right	0.16	0.2	0.17	0.2

Summary

4.12 It is clear from the analysis that all of the junctions are operating very much within capacity at present. The highest RFC values occur at the Barnsley Road / Manor Road junction but the maximum RFC of 0.38 is well within the recommended value of 0.85. Similarly, no junctions had queues in excess of 1 vehicle. The results of the analysis accord with on- site observations of

the operations of the junction which confirm that traffic flows are generally light and there is no congestion on the network at present. This therefore validates the junction models.

Accidents

4.13 A desktop study of reported injury accidents has been undertaken to establish the safety record of the surrounding highway. A plan showing the location of the accidents referred to is included at **Appendix 13**.

4.14 Data has been obtained for the 5 years between January 2010 and December 2014 from the CrashMap website (www.crashmap.co.uk). This site uses data held by police relating to road traffic accidents where an injury occurred. The data is approved by the National Statistics Authority and is used by the Department for Transport.

4.15 The accident record for the surrounding area is good, with a relatively low incidence of injury accidents. During the assessment period, a total of ten accidents have been recorded on the highway network in the immediate vicinity of the site.

4.16 There is no obvious common cause to these accidents. There is a small cluster of three accidents at the junction of Manor Road and Newland Avenue.

4.17 Of the ten recorded accidents, three have involved cyclists and four involved pedestrians.

4.18 The data shows that there have been no fatal accidents within the last five years. There have been four serious accidents, of which:

- one accident occurred on Newland Avenue;
- two accidents occurred on Lunn Road; and
- one accident occurred White Cross Road.

4.19 All other accidents were slight and are low in frequency given the nature of many surrounding main roads and speed limits.

4.20 No accidents occurred on Carrs Lane or between the southern end of Newlands Avenue and its junction with Newtown Avenue.

4.21 On the basis of this data, it is concluded that there are no existing highway safety issues in the vicinity which the proposed development would make worse.

5.0 THE PROPOSED DEVELOPMENT

5.1 It is proposed to provide a residential scheme of 278 units which are to be built on open farm land to the west of Carrs Lane. The scheme includes for a mix of 2, 3 and 4 bedroomed houses and 2 and 3 bedroomed bungalows.

5.2 A plan showing the proposed site layout is included at **Appendix 14**.

Site Access

5.3 The development will take vehicular access from the local highway network by way of a new priority junction emerging on to Carrs Lane to the east of the site and an extension to Newland Avenue from the north.

5.4 The Carrs Lane access will provide a 5.5m access road with 6m kerb radii and a 2m wide footway to both sides separated from the carriageway by a grass verge. The access road will be located onto the western side of Carrs Lane approximately 300m to the south of its junction with White Cross Road.

5.5 A visibility splay which is in excess of 2.4m x 43m will be provided at the access. This will exceed the requirements of MfS for a 30 mph speed limit.

5.6 The plan at **Appendix 15** shows how a visibility splay in excess of 2.4m x 43m can be achieved from the site access to oncoming traffic in both directions.

5.7 It has previously been shown that Carrs Lane is typically 5.6m wide. This is sufficiently wide to serve a residential scheme such as this and accords with the South Yorkshire Residential Design Guide.

5.8 The second site access will be provided at the north-west corner of the site via Newlands Avenue. The carriageway width will be some 5.5m wide with 2m wide footways on both sides which will be segregated from the carriageway by grass verges. This road will widen out to tie in to the wider carriageway of Newland Avenue. The new access road will simply be a continuation of the existing Newland Avenue into the site and will maintain the existing characteristics of the residential road.

5.9 Again, it is clear that Newland Avenue is a wide residential road and can clearly accommodate the traffic from the development in a safe manner. Its use as an access to the scheme is fully in accordance with South Yorkshire Residential Design Guide and MfS. Indeed, the width of

Newland Avenue is 7.3m which is well in excess of the 5.5m requirement and it also has a straight, relatively flat alignment with good forward visibility.

5.10 In addition to the two vehicular access routes, the development will provide traffic free, pedestrian accesses to tie into the footway of Summerdale Drive on the northern boundary of the site.

Internal Site Layout

5.11 The South Yorkshire Residential Design Guide sets out recommendations the design of residential roads based on the design speed and use. For a 30mph residential road, the minimum carriageway width is 5.5m and for a 20mph road is 4.8m.

5.12 The main access spine road through the site road is proposed to have a 5.5m wide carriageway with 6m kerbed radii. It will be lit and will have 2m wide footways along both sides of the carriageway with verges on some locations

5.13 The internal layout of the site seeks to provide an indirect spine road alignment through the site. This will include for a series of shared spaces and speed tables, along with changes of alignment, colour and materials which will discourage the use of the site as a through route.

Parking Standards

5.14 Car parking for the development has been provided in accordance with the requirements set out in the BMBC guidance publication "Supplementary Planning Document: Parking". Table 5.1 shows the maximum car parking requirements for a use class C3 Residential Development

Table 5.1: BMBC Residential Maximum Permitted Car Parking

USE	BARNSLEY URBAN	BOROUGHWIDE	THRESHOLD ABOVE WHICH STANDARD APPLIES
Housing and flats	1 space for dwellings with 1 or 2 bedrooms 2 spaces for dwellings with 3 or more bedrooms	1 space for dwellings with 1 or 2 bedrooms 2 spaces for dwellings with 3 or more bedrooms	All Development

5.15 Based on the location of the proposed development within the Borough, the maximum permitted parking is some 416 spaces for the development. The proposals will therefore provide car

parking within the driveways and garages of the dwellings in accordance with the maximum car parking standards.

5.16 Cycle parking will be provided within the curtilage of the dwellings themselves.

Swept Paths

5.17 The plan at **Appendix 16** shows the swept path analysis of the site layout and demonstrates that a refuse vehicle can enter the site in forward gear, circulate around the site and leave the site in forward gear.

Highway Mitigation Works

5.18 The analysis which follows in Section 7 of this report demonstrates that there are no issues with the capacity of the highway network and therefore there is no need to increase junction capacity. It has also been demonstrated that the network operates safely and that there is no need to introduce any road safety improvements.

5.19 Following a dialogue with BMBC officers, it is apparent that there are opportunities to provide some small scale highway mitigation works which would improve the highway network and further increase the level of road safety. It is intended to propose the following works and a planning condition covering their delivery would be acceptable to the applicant.

Carrs Lane Footway Widening

5.20 The existing footway on Carrs Lane to the south of its junction with White Cross Lane is narrow. Conversely, the carriageway at this point is wider than the 5.5m width recommended by the South Yorkshire Residential Design Guide. Hence it is proposed that the western footway is widened to provide a continuous route for pedestrians between the site, Lunn Road and hence the centre of Cudworth.

5.21 Initial designs have been discussed with BMBC highway officers. A detailed topographical survey is being undertaken in order that an accurate layout can be provided which will improve the footway provision and the level of road safety whilst maintaining maintain sufficient carriageway width for vehicles. It is intended to carry out a Road Safety Audit of the footway widening works prior to the planning application being considered at Planning Committee.

Low Cudworth Pedestrian Measures

5.22 In order to improve the provisions for pedestrians, it is proposed to:-

- Extend the footway on the south side of Low Cudworth to enable pedestrian to cross more safely;
- Provide a short footway link at the end of the western footway on Low Cudworth Green to the bottom of the steps up to White Cross Road;
- Provide road signs warning of pedestrians within the carriageway on the steep section of Low Cudworth where there is no footway provision as it runs up to White Cross Road;

Carrs Lane / Lunn Road / White Cross Road Junction

5.23 The existing road markings are in poor condition and so will be marked out again so that drivers can clearly see the give way line and centre of carriageway markings as the road bends at the junction. In addition, a 'junction ahead' warning sign will be provided to make drivers approaching from the north aware of the presence of the junction.

5.24 There is some car parking taking place wholly or partly on the western footway of Lunn Road on the approach to the junction which narrows the available footway width for pedestrians. Hence some 'half and half' markings will be provided to ensure that such vehicles park partly on the carriageway and partly on the footway to enable sufficient footway width to be provided.

Manor Road / Barnsley Road

It has been shown that this junction is operating safely operation at present and it is considered that it will continue to do so with development in place. However, it has been noticed that drivers turning right from Barnsley Road onto Manor Road tend to 'cut of the corner' and encroach on to the opposite side of the road. In addition to this BMBC officers have advised that the visibility splay to the right is obscured by parked vehicles. Hence, it is proposed to provide amended lane and give way line markings and measures to restrict the car parking will be considered.

5.25 Further information will be provided on the above works during the course of the consultation period for the planning application.

6.0 TRIP GENERATION

6.1 In order to calculate the trip generation of the proposed development, the TRICS database has been interrogated for surveys of residential development similar to that proposed. The following search criteria for the residential TRICS-based trip rates are as follows:

- Land use – Houses Privately Owned;
- Development size of between 30 and 490 units;
- Greater London and all Ireland excluded;
- Only site located in Suburban and Edge of Town areas;
- Multi model sites; and
- Weekday only surveys.

6.2 The multi-modal TRICS output for the scheme is included in **Appendix 17** and summarised in Table 6.1.

Table 6.1 – Trip Rates per Dwelling by Mode

	Weekday AM Peak Hour		Weekday PM Peak Hour	
Mode	**Arrivals**	**Departures**	**Arrivals**	**Departures**
Pedestrians	0.046	0.155	0.076	0.054
Cyclists	0.004	0.022	0.018	0.010
Public Transport	0.002	0.017	0.016	0.005
Vehicles	0.156	0.404	0.362	0.210

6.3 The number of multi modal trips generated by the proposed development has been calculated and is summarised in Table 6.2.

Table 6.2 – Estimated Multi-Modal Trips from 150 Dwellings

	Weekday AM Peak Hour		Weekday PM Peak Hour	
Mode	**Arrivals**	**Departures**	**Arrivals**	**Departures**
Pedestrians	13	44	22	15
Cyclists	1	6	5	3
Public Transport	1	5	5	1
Vehicles	**45**	**116**	**104**	**60**

6.4 The proposed development is therefore anticipated to generate 161 two-way vehicular trips on the local highway network in the morning peak and 164 two-way trips in the evening peak. This equates to less than two vehicles every three minutes during the AM and PM peaks. Traffic flows during the day and evenings will be very much less than the peak hour flows.

Distribution

6.5 The development generated traffic has been distributed based on the Office for National Statistics Travel to work data for the output area in which the development lies. This distribution pattern has been used to determine the distribution of the development traffic flows.

6.6 Three routes have been identified based on the destination output areas from the area in which the site is located. These are:

- Barnsley Road (west of the site towards the Cundy Cross roundabout);
- Barnsley Road (north of Cudworth town centre); and
- White Cross Lane (east of the site).

6.7 Table 6.2 summarises the distribution pattern for the development and the full calculation including the route assignments can be seen at **Appendix 18**.

Table 6.2: Trip Distribution

Arrive / Depart	Proportion (%)
Barnsley Road (west)	48
Barnsley Road (north)	32
White Cross Road (east)	20

6.8 The plans at **Appendix 19** show the distributed traffic flows by trip type on the surrounding highway network.

7.0 TRAFFIC IMPACT ASSESSMENT

7.1 This Chapter describes the impact of the additional trips generated by the proposed development on the operation of the local highway network in the future year scenario with and without development traffic.

Future Baseline Traffic Conditions

7.2 The following factors affect the baseline conditions.

Traffic Growth

7.3 To accord with 'Guidance on Transport Assessment', the year of assessment should be five years after the registration of the planning application which is 2020.

7.4 In order to quantify the level of background traffic growth that could occur on the local network, National Traffic Model growth factors, modified by TEMPRO local growth factors, have been used for the Cudworth 'urban' area. The growth factors are summarised in Table 7.1 and a copy of the full calculations can be seen at **Appendix 20**.

Table 7.1 – Traffic Growth Factors

Period	AM Peak	PM Peak
2015 to 2020	1.093	1.095

7.5 The above growth factors have been applied to the surveyed traffic flows to obtain the 2020 growthed traffic flows. The resulting peak hour traffic flows can be seen on the plan at **Appendix 21.**

Committed Developments

7.6 BMBC has advised of committed developments within the local network that would impact on the junctions assessed in this report**.**

7.7 Planning permission for a new discount food store in Cudworth has been granted but the scheme is not yet trading. The development flows associated with the discount food store have been obtained from the relevant Transport Assessment and have been considered as part of the baseline traffic flows.

7.8 The plans at **Appendix 22** show the discount food retail AM and PM peak hour traffic flows on the highway network.

Baseline and Baseline plus Development Traffic Flows Scenarios

7.9 The 2020 baseline traffic flows are simply the committed development traffic flows and traffic growth combined whilst the 2020 baseline plus development flows also include the assigned development traffic flows. The resulting peak hour traffic flows for both scenarios can be seen at **Appendix 23** and **Appendix 24** respectively.

An assessment of the junctions using the 2020 baseline traffic flows and 2020 baseline plus development traffic flows has been undertaken using the Junctions 9 software. The results from the two scenarios at each of the junction are compared in the following tables.

Junction 1: Newland Avenue / Newtown Avenue

7.10 Table 7.2 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 8**.

Table 7.2: Junction Analysis; Base & Base plus Devt; Newland Avenue / Newtown Avenue

Movement	Baseline				Baseline + Development			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Newtown Avenue	0.08	0.1	0.11	0.1	0.08	0.1	0.13	0.1
Newland Avenue South	0.14	0.2	0.13	0.1	0.24	0.3	0.17	0.2
Newland Avenue North	0.14	0.2	0.20	0.2	0.17	0.2	0.26	0.4

7.11 Analysis shows that the even in the future year scenario with the development traffic included the junction will continue to operate well below capacity with the Newland Avenue approach arm having an RFC of 0.26 and less than 1 vehicle queue in the PM peak hour. The remaining arms of the roundabout are predicted to operate with even more spare capacity.

Junction 2: Carrs Lane / White Cross Road / Lunn Road

7.12 Table 7.3 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 9.**

Table 7.3: Junction Analysis; Base & Base plus Devt; Carrs Lane / White Cross Road / Lunn Road

Movement	Baseline				Baseline + Development			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Carrs Lane left to Lunn Road	0.09	0.1	0.12	0.1	0.08	0.1	0.13	0.2
Carrs Lane right to White Cross Road	0.04	0.0	0.09	0.1	0.14	0.2	0.12	0.1
Lunn Road ahead to White Cross Road left to Carrs Lane	0.09	0.1	0.12	0.1	0.10	0.1	0.14	0.2

7.13 The results above show that the junction operates within capacity in both scenarios and in both the AM and PM peak hours. The impact of the development traffic is negligible and results in a slight increase in the RFC of 10% from 0.04 to 0.14 RFC in the AM peak hour period on the Carrs Lane approach and a corresponding increase in the vehicle queue of less than one vehicle. Hence this junction will operate very much within capacity with development in place and with the traffic growth and committed development considered.

Junction 3: Barnsley Road / Manor Road

7.14 Table 7.4 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 10**.

Table 7.4: Junction Analysis Base & Base plus Devt; Barnsley Road / Manor Road

Movement	2020 Baseline				2020 Baseline + Dev			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Manor Road left and right turn to Barnsley Road	0.43	0.7	0.31	0.4	0.53	1.1	0.37	0.6
Barnsley Road South right turn into Manor Road ahead to Barnsley Road North	0.19	0.3	0.28	0.5	0.23	0.3	0.37	0.7

7.15 During both the AM and PM peak hour periods, the RFC's on the approach arms to the junction remain well below 0.85 on all of the approach arms. The highest increase in RFC occurs on Manor Road which rises from 0.43 to 0.53 as a consequence of the development traffic. This is still well below the 0.85 threshold and still well within capacity. Vehicle queues remain low and the junction will operate satisfactorily.

Junction 4: Manor Road / Newland Avenue

7.16 Table 7.5 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 11**.

Table 7.5: Junction Analysis ; Base and Base plus devt ; Manor Road / Newland Avenue

Movement	2020 Baseline				2020 Baseline + Dev			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)
Newland Avenue left turn to Manor Road west	0.14	0.2	0.10	0.1	0.23	0.3	0.15	0.2
Newland Avenue right turn to Manor Road east	0.10	0.1	0.11	0.1	0.15	0.2	0.14	0.2
Manor Road west ahead and right to Newland Avenue	0.12	0.1	0.20	0.3	0.16	0.2	0.29	0.4

7.17 During both the AM and PM peak periods, the RFC's are well below 0.85 on all approaches. The maximum predicted RFC is 0.29 on Manor Road in the PM peak and predicted queues are less than one vehicle, demonstrating the junction will operate efficiently even with the proposed development traffic included.

Junction 5: Barnsley Road / St John's Road

7.18 Table 7.6 shows the summary of the analysis in the AM and PM peak hours. A full copy of the analysis is shown at **Appendix 12**.

Table 7.6: Junction Analysis Base; Barnsley Road / St John's Road

Movement	Baseline		Baseline + Dev	
	AM PEAK	PM PEAK	AM PEAK	PM PEAK

	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)	RFC	MMQ (PCU)
St John's Road left turn to Barnsley Road west	0.22	0.3	0.11	0.1	0.23	0.3	0.12	0.1
St John's Road right turn to Barnsley Road east	0.21	0.3	0.16	0.2	0.31	0.4	0.22	0.3
Barnsley Road west ahead and right	0.18	0.2	0.19	0.3	0.18	0.2	0.19	0.3

7.19 The results show that the junction will continue to operate well within capacity during both the AM and PM peak hours with vehicle queues predicted to be less than one vehicle in length on any of the approaches.

Summary

7.20 The analysis shows that the junction will continue to operate satisfactorily during the AM and PM peak periods in the design year, even with the addition of the development generated traffic with modest increases in the RFC's and associated vehicle queues and the junctions operating well below their theoretical capacities

8.0 SUMMARY AND CONCLUSIONS

8.1 This Transport Assessment has considered the traffic and highway implications of a proposed residential development of some 278 dwellings to the west of Carrs Lane in Cudworth, near Barnsley.

8.2 The development is accessible on foot or by cycle to a range of local destinations. There are also convenient and realistic options for undertaking trips by public transport for journeys further afield. The site is well served by local facilities and services in the centre of Cudworth and therefore it is in a sustainable location.

8.3 It is demonstrated that the highway network in the vicinity of the site is operating safely and well within capacity at present.

8.4 Vehicular and pedestrian access to the development will be by way of a new access approximately midway along Carrs Lane and also by extending the southern end of Newland Avenue into the site.

8.5 The development is predicted to generate some 161 and 164 vehicle trips in the morning and evening peak hours respectively.

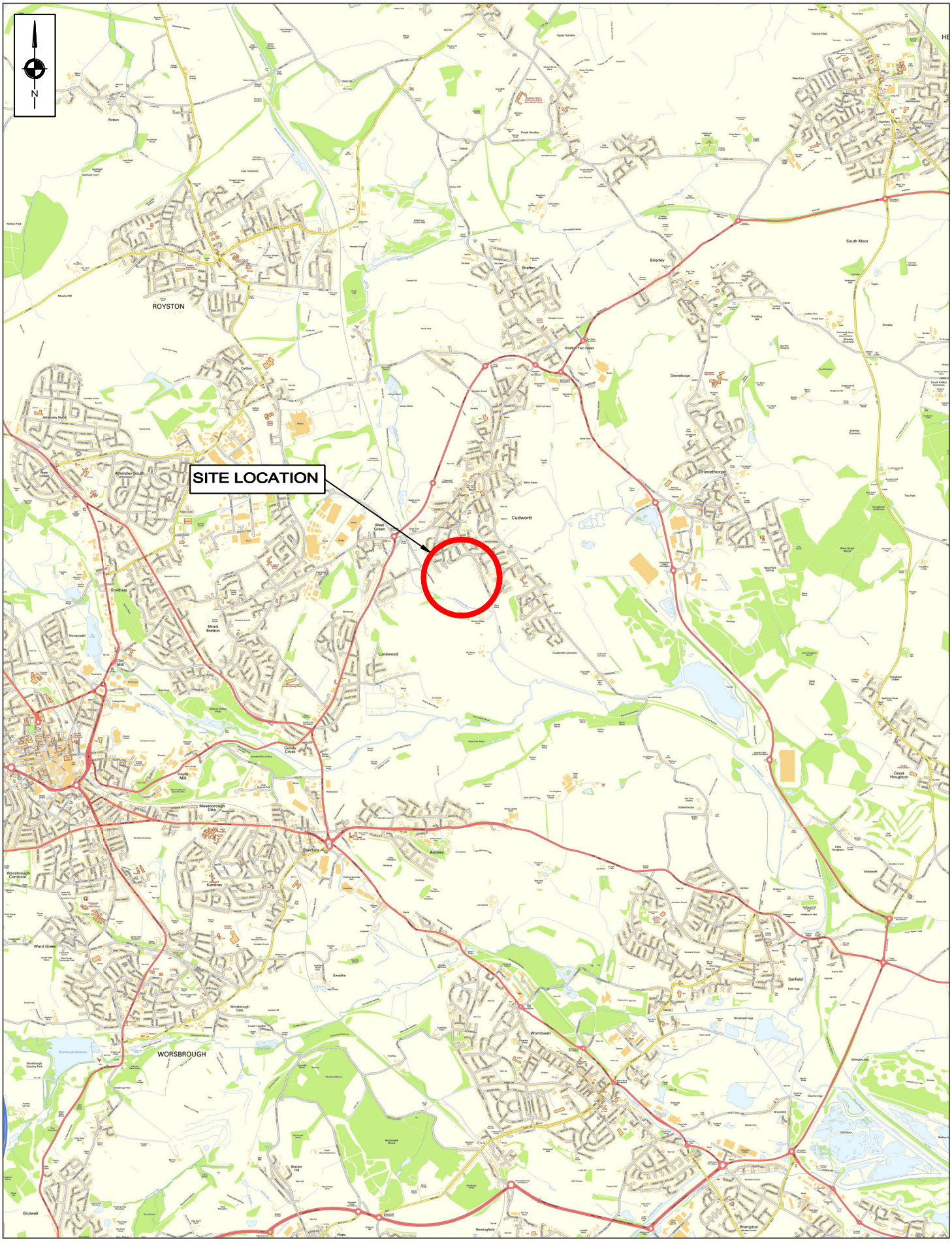
8.6 An assessment of the operation of the local highway network in the vicinity of the site has been undertaken and has shown that, even with the development traffic, the local highway network will continue to operate well within capacity.

8.7 Some footway widening works are proposed on Carrs Lane to remove a ‘pinch point’ where the existing footway is narrow. It is intended that a Road Safety Audit of the footway widening work will be carried out prior to the consideration of the scheme at planning committee. Some other traffic management measures are also proposed as part of the scheme.

8.8 In conclusion, it has been shown that the proposed residential scheme will not have a severe impact and consequently there are no material highways or traffic reasons why planning permission should not be granted.

S|C|P

APPENDIX 1



S C P

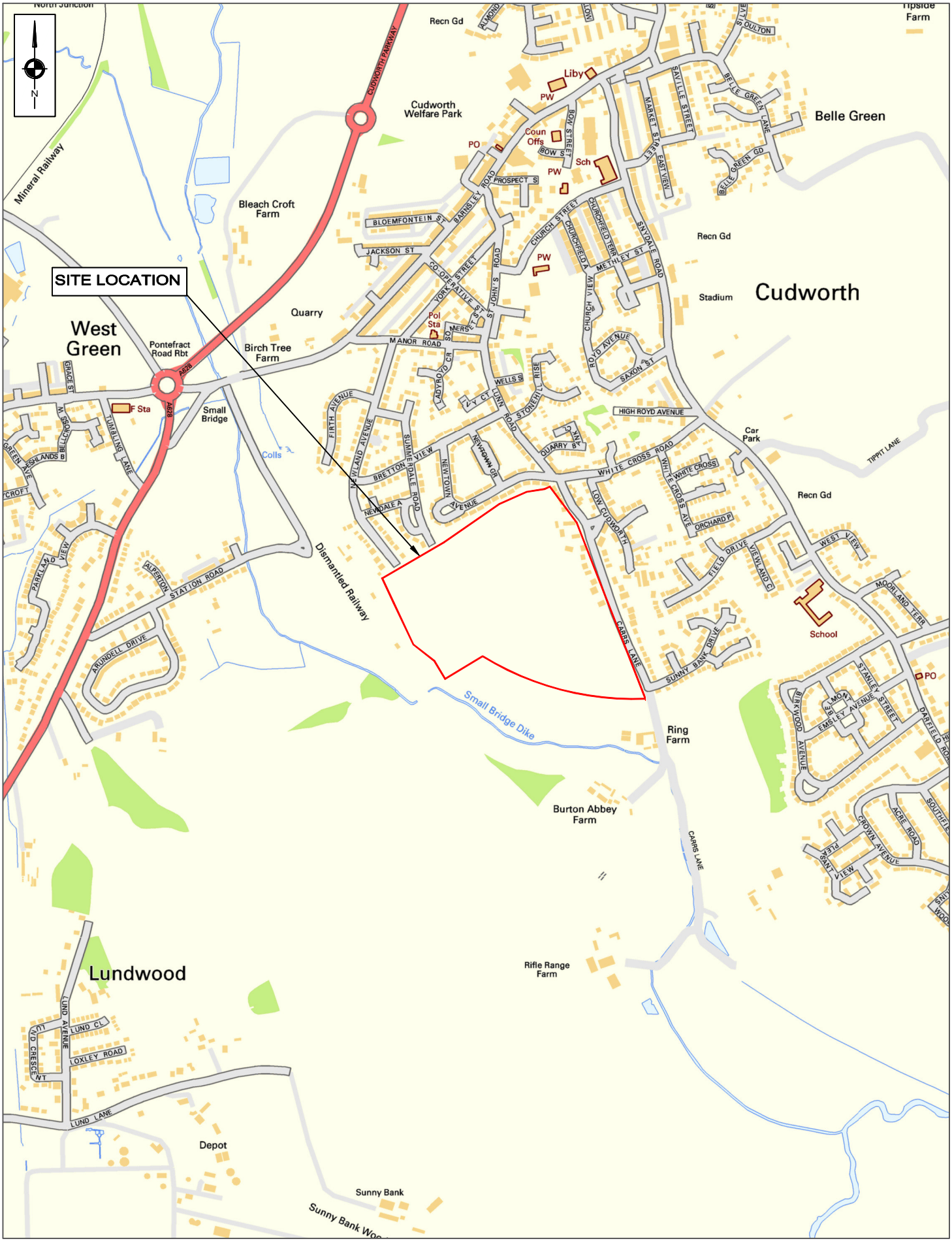
Transportation Planning : Infrastructure Design

Riverside Studio, 32 The Calls, Leeds, LS2 7EW, Tel 0113 887 3323
www.scptransport.co.uk, Email info@scptransport.co.uk

Project Title: CARRS LANE , CUDWORTH	Drawing Title: SITE LOCATION PLAN	Scale: 1:50000 @ A4	By: VL	Drawing No.: SCP/14923/SK01
		Date: 31.07.2015	Checked: TH	
		Approved/ Unapproved: -	Status: PLANNING	Revision: -

S|C|P

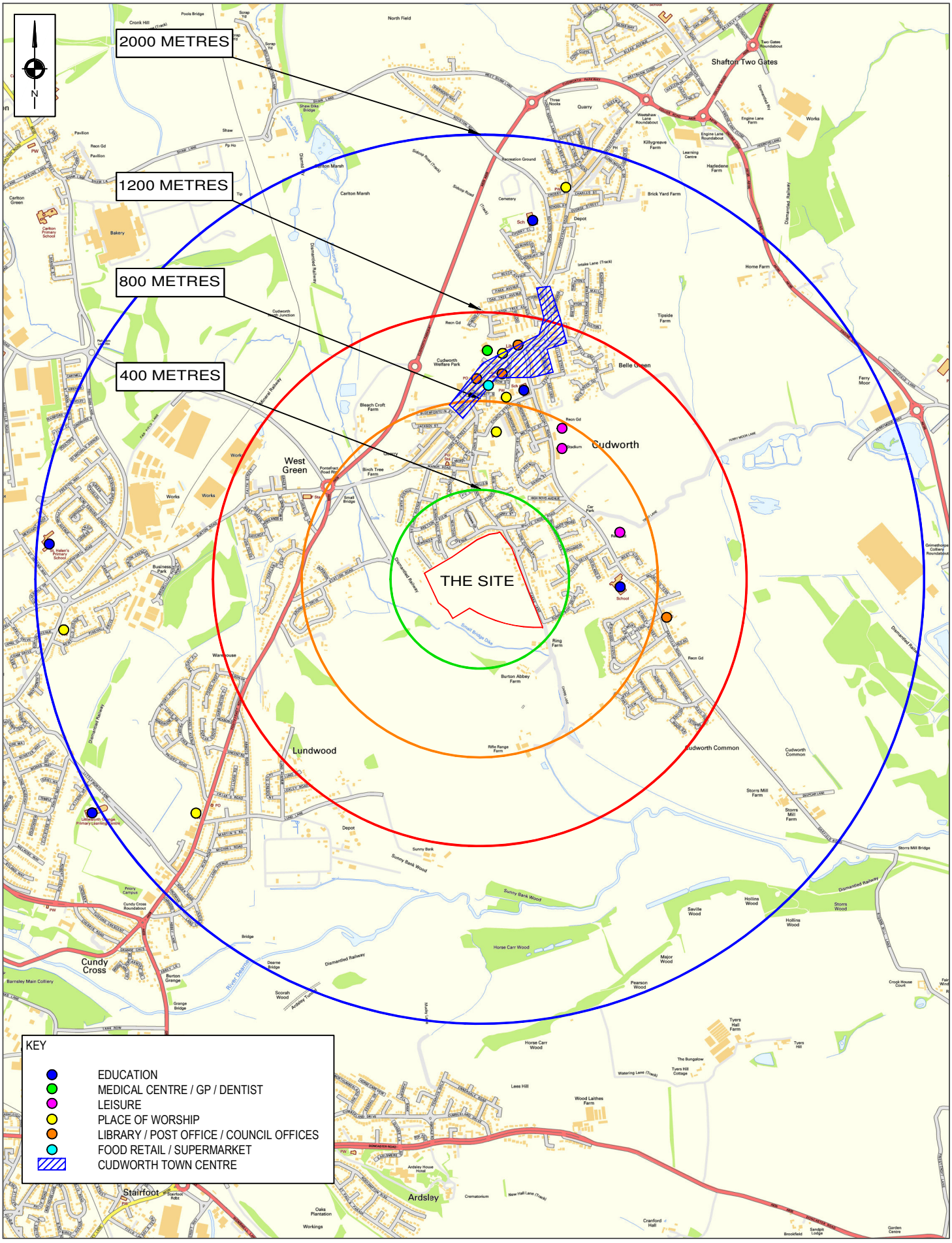
APPENDIX 2



S C P Transportation Planning : Infrastructure Design Riverside Studio, 32 The Calls, Leeds, LS2 7EW, Tel 0113 887 3323 www.scptransport.co.uk, Email info@scptransport.co.uk	Project Title CARRS LANE , CUDWORTH	Drawing Title LOCAL HIGHWAY NETWORK	Scale 1:10000	By VL	Drawing No. SCP/14923/SK14
			Date 31.07.2015	Checked TH	
			Approved/ Unapproved -	Status PLANNING	Revision -

S|C|P

APPENDIX 3



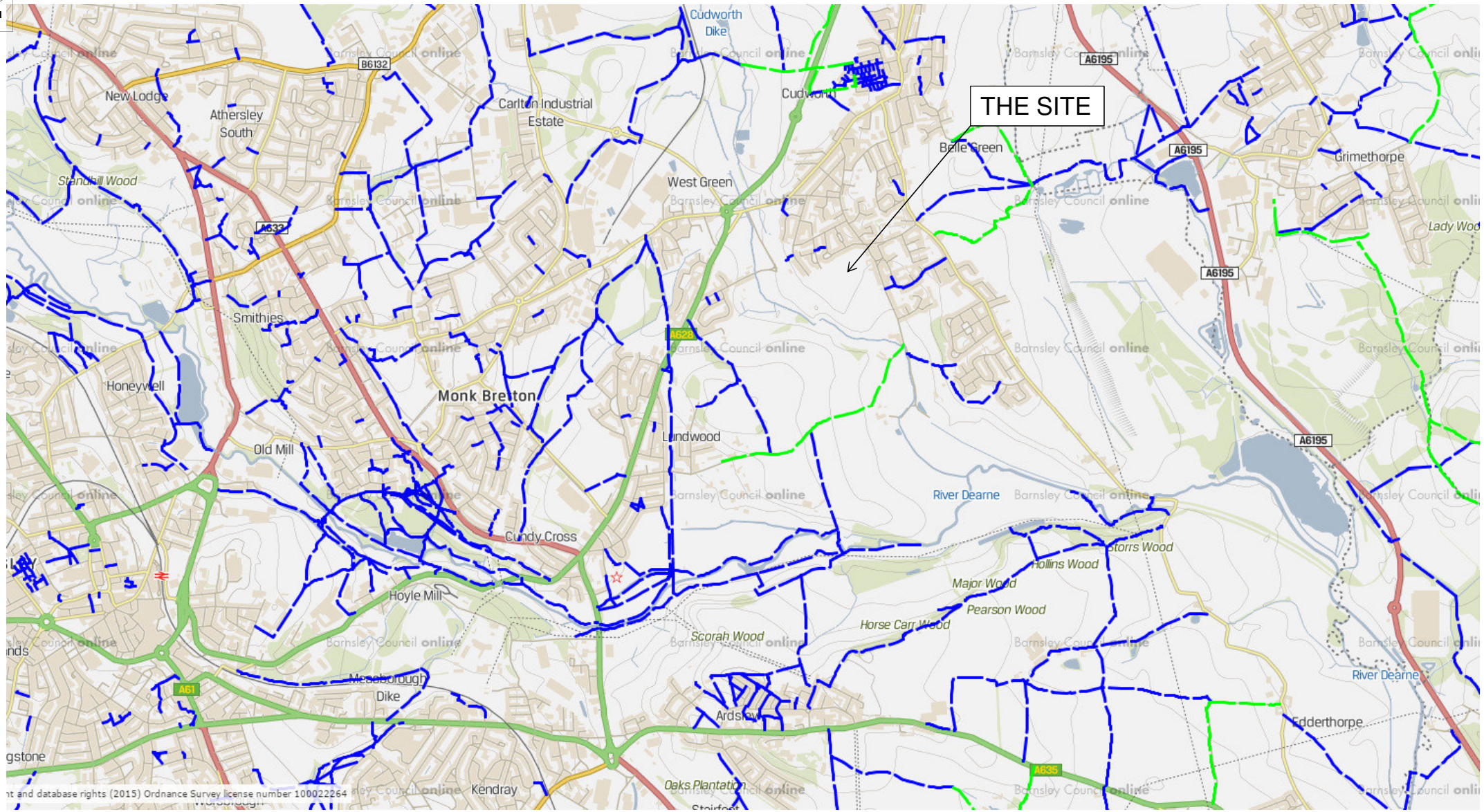
SCP
Transportation Planning : Infrastructure Design
Riverside Studio, 32 The Calls, Leeds, LS2 7EW, Tel 0113 887 3323
www.scptransport.co.uk, Email info@scptransport.co.uk

Project Title: CARRS LANE , CUDWORTH	Drawing Title: PEDESTRIAN CATCHMENT AREAS & LOCAL FACILITIES	Scale: N.T.S	By: VL	Drawing No.: SCP/14923/SK04
		Date: 31.07.2015	Checked: TH	
		Approved/ Unapproved: -	Status: PLANNING	Revision: -

S|C|P

APPENDIX 4

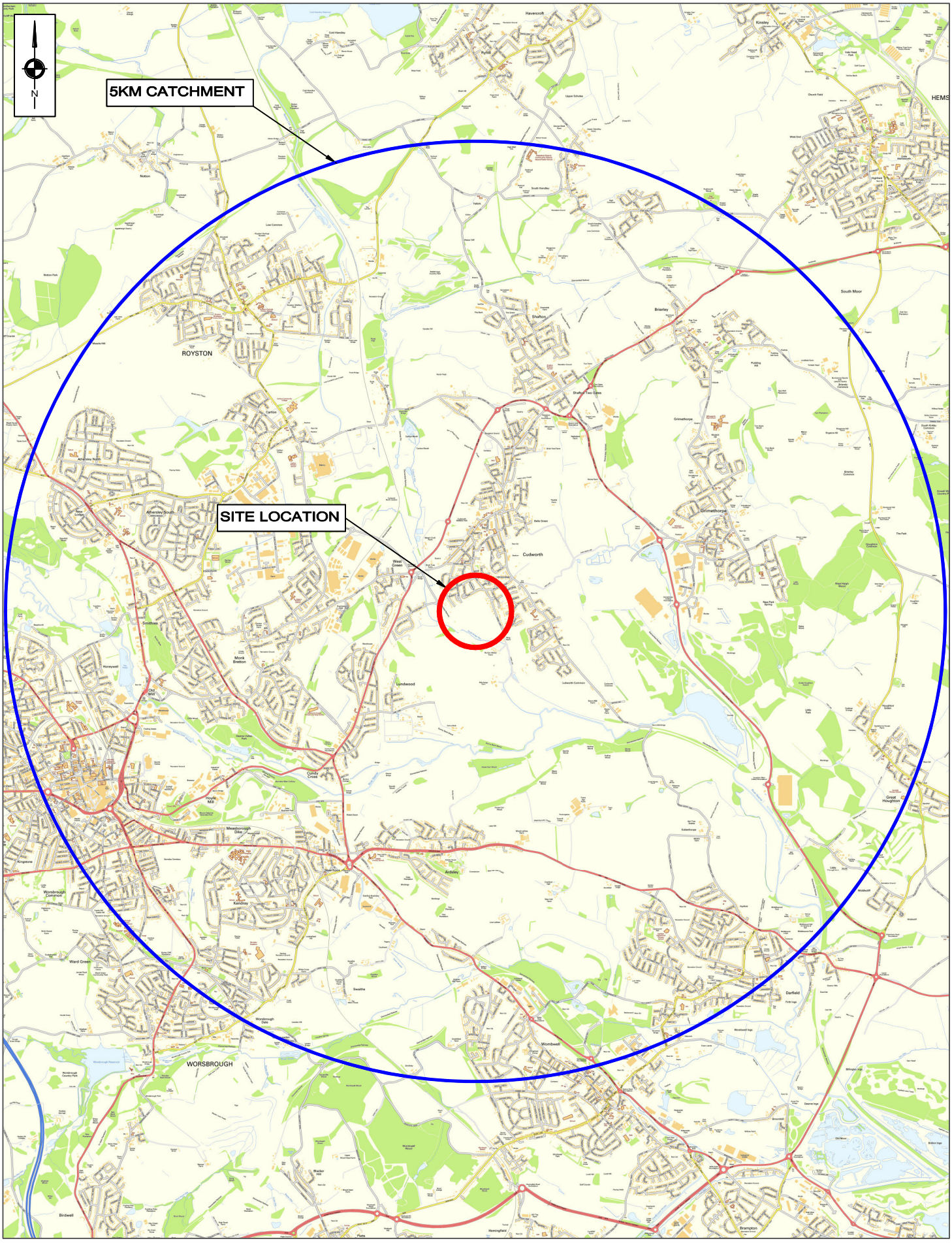
© Crown Copyright. All Rights Reserved. 2010 License Number 0100031673



S|C|P Transportation Planning : Infrastructure Design www.scptransport.co.uk	Project Title: PROPOSED RESIDENTIAL DEVELOPMENT, CARRS LANE, CUDWORTH	Drawing Title: PUBLIC RIGHTS OF WAY	Scale: NTS@ A3	By: TH	Rev	Description	Date	By	Figure 19	
			Date: 15.09.2015	Checked: GWB	-	-	-	-		
			Approved/Unapproved	Status: PLANNING	-	-	-	-	Revision: A	

S|C|P

APPENDIX 5



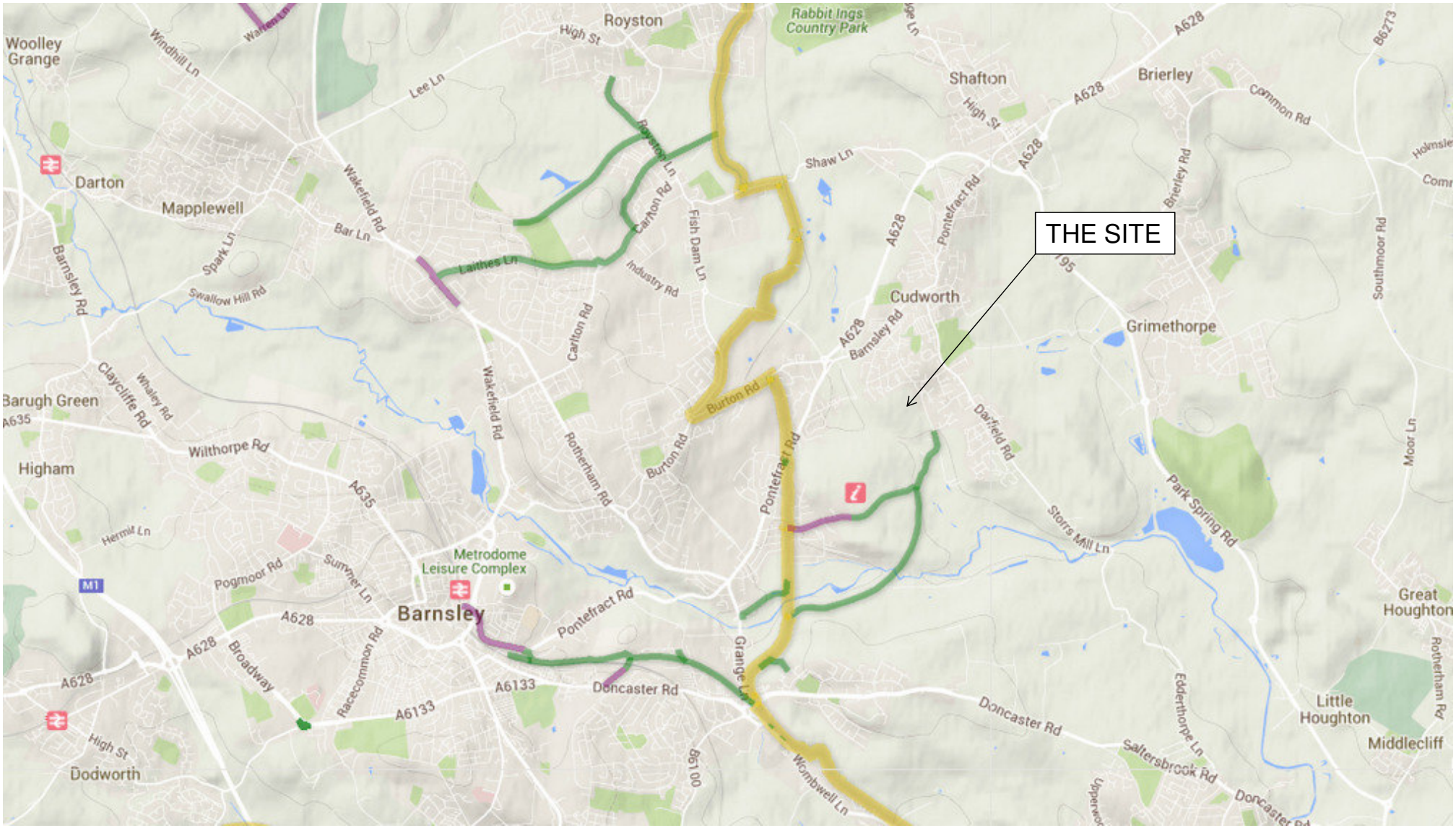
S C P

Transportation Planning : Infrastructure Design

Riverside Studio, 32 The Calls, Leeds, LS2 7EW, Tel 0113 887 3323
www.scptransport.co.uk, Email info@scptransport.co.uk

Project Title: CARRS LANE , CUDWORTH	Drawing Title: 5M CYCLE CATCHMENT	Scale: N.T.S	By: VL	Drawing No.: SCP/14923/SK03
		Date: 31.07.2015	Checked: TH	
		Approved/ Unapproved: -	Status: PLANNING	Revision: -

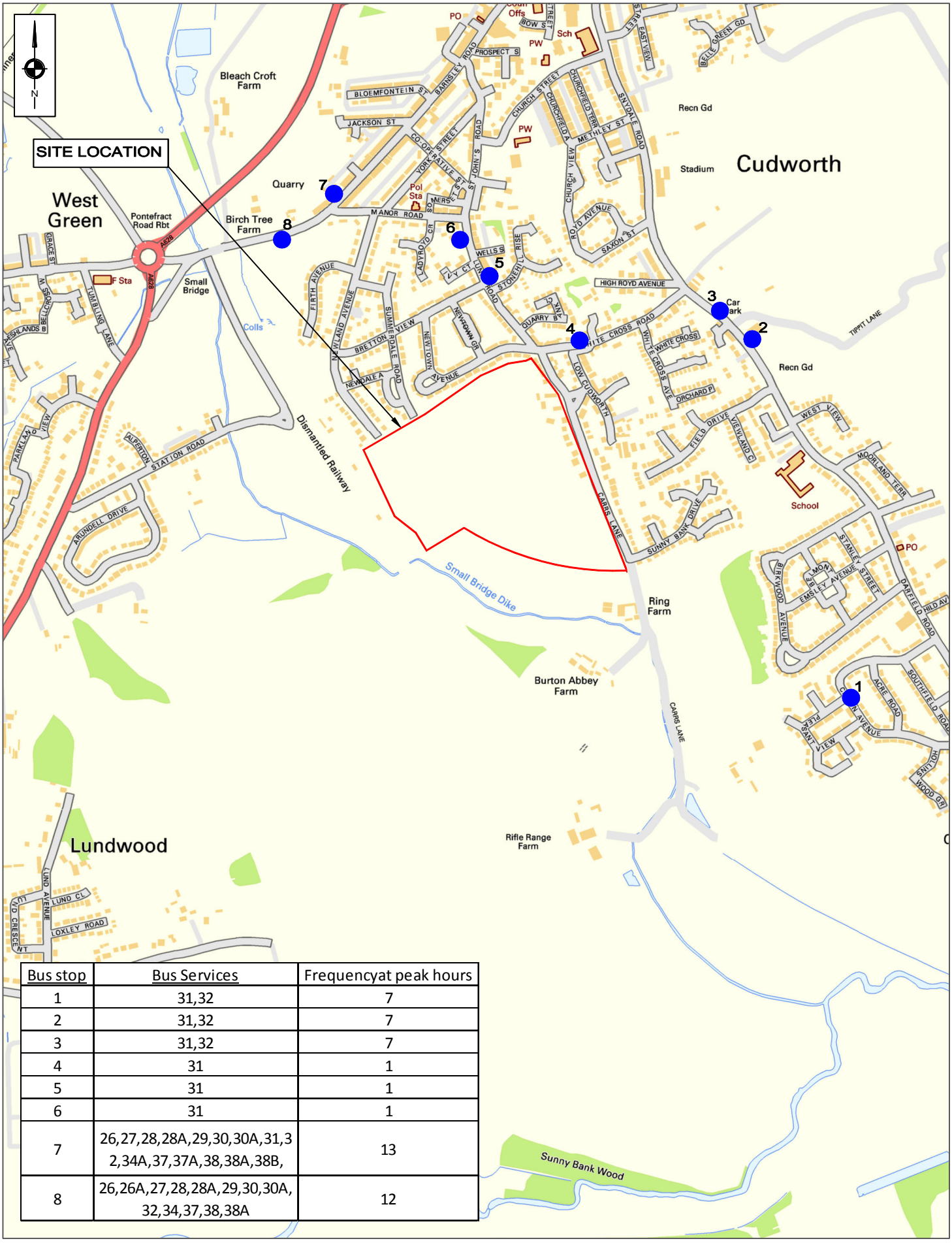
© Crown Copyright. All Rights Reserved. 2010 License Number 0100031673



S|C|P Transportation Planning : Infrastructure Design www.scptransport.co.uk	Project Title: PROPOSED RESIDENTIAL DEVELOPMENT, CARRS LANE, CUDWORTH	Drawing Title: LOCAL CYCLE ROUTES	Scale: NTS@ A3	By: TH	Rev / Description / Date / By				Figure 20
			Date: 15.09.2015	Checked: GWB					Revision: A
			Approved/Unapproved	Status: PLANNING					

S|C|P

APPENDIX 6



Bus stop	Bus Services	Frequencyat peak hours
1	31,32	7
2	31,32	7
3	31,32	7
4	31	1
5	31	1
6	31	1
7	26,27,28,28A,29,30,30A,31,32,34A,37,37A,38,38A,38B,	13
8	26,26A,27,28,28A,29,30,30A,32,34,37,38,38A	12

SCP
Transportation Planning : Infrastructure Design
Riverside Studio, 32 The Calls, Leeds, LS2 7EW, Tel 0113 887 3323
www.scptransport.co.uk, Email info@scptransport.co.uk

Project Title	Drawing Title	Scale	By	Drawing No.
CARRS LANE , CUDWORTH	BUS STOP LOCATION PLAN	NTS	VL	SCP/14923/SK02
		Date: 31.07.2015	Checked: TH	
		Approved/ Unapproved: -	Status: PLANNING	Revision: -