PLANNING

KIRKLEES LOCAL PLAN EXAMINATION

HEARING STATEMENT

Matter 36 – Dewsbury and Mirfield Safeguarded Land

Site: SL2163 – Balderstone Hall Lane, Mirfield

MARK LANE
ON BEHALF OF BELLWAY HOMES

KIRKLEES LOCAL PLAN EXAMINATION

On behalf of: Bellway Homes

In respect of: Kirklees Local Plan Examination – Matter 36

Date: January 2018

Reference: 2691/R005/EiP-M36

Author: ML

DPP Planning
Second Floor
1 City Square
Leeds
LS1 2ES

Tel: 0113 350 9865
E-mail info@dppukltd.com

www.dppukltd.com

Contents

Appendices

1.0 Introduction

1.1 This hearing statement is submitted on behalf of Bellway Homes in order to assist the Inspector in her examination of the Kirklees Local Plan ('the Local Plan'). The statement specifically relates to Matter 36 of the Inspector's MIQs and the proposed safeguarded land allocation known as SL2163 - Balderstone Hall Lane, Mirfield.

1.2 Bellway Homes have previously made representations to the Local Plan in respect of their land interests Balderstone Hall Lane, Mirfield. A hearing statement in relation to Matter 8 of the Inspector's MIQ has also been submitted as part of the Local Plan examination. We would direct the Inspector to both these representations.

2.0 Question a) Are identified access/other constraints i) capable of being resolved, and ii) unlikely to be resolved until 2031 or beyond?

Introduction

2.1 I have already set out my concerns in my response to MIQ Matter 8 regarding the Council's approach of simply rolling forward POL sites. I noted that the Council have either:

i. *Not had insufficient regard to the information submitted to them by agents and land owners which demonstrates that the POL sites are available, suitable and deliverable; or*
ii. *The Council have not sufficiently explored ways to resolve any alleged development issues; or*
iii. *The Council are not sufficiently mindful of the potential to resolve any alleged development issues that may exist within the plan period.*

2.2 This is particularly true of land off Woodward Court/Hepworth Lane, Mirfield (Site ref: SL2163) which despite being a POL site and within the existing development limits has been allocated as a safeguarded land in the Local Plan and not a housing allocation.

2.3 The technical consultation summary of SL2163 set out within the Sustainability Appraisal (ref: SD5/EX14- Appendix 2) states that the only significant site constraint (red score) is related to highways/transport. The specific comments justifying this score states:

"Third part land required to achieve visibility splays. Hepworth Lane is unsuitable for intensification"

2.4 Whilst I do not agree with this overall conclusion in the first instance, I have placed these overarching concerns to one side, and instead would draw the Inspector's attention to the current planning application submitted on part of SL1163.

Pre- Application Discussion

2.5 A formal pre-app enquiry to the Council on the 7th March 2017. The enquiry was made in order to ascertain the Council's views on a proposed residential scheme for circa 60 dwellings along with associated access, drainage, open space and landscaping.

2.6 A copy of the formal pre-app response is attached at Appendix 2 of this report, which also summarises the feedback received from the statutory consultees. The pre-app feedback was positive with the concluding comments of the pre-app response stating that: -

"The proposed development is considered to be acceptable in principle and, subject to the issues above being addressed, it is likely to be viewed as a sustainable form of development."

2.7 Whilst it was noted during pre-app discussions that the proposed development would need to be supported by a suite of technical reports and drawings, no technical issues were identified that would preclude the early and beneficial development of the site.

Current Planning Application

2.8 A planning application was submitted to Kirklees Council in December 2017 on part of SL2163 for the erection of 61 dwellings with associated access, drainage, open space and landscaping. The red line plan is attached at Appendix 1.

2.9 The application was supported by a comprehensive suite of plans and documents, including the following reports: -

- A Planning Statement prepared by DPP;
- Design and Access Statement prepared by STEN Architecture;
- Statement of Community Involvement prepared by DPP;
- Heritage Statement prepared by BWB;
- Transport Assessment prepared by AMA;
- Preliminary Ecological Assessment prepared by Brooks Ecological;
- Bat Activity Survey prepared by Brooks Ecological;
- Arboricultural Report prepared by JCA Limited;
- Tree Constraints Plan prepared by JCA Limited;
- Flood Risk Assessment prepared by Eastwood & Partners; and
- Geoenvironmental Appraisal prepared by Lithos consulting.

2.10 These reports demonstrate that there are no constraints to the development of the site which is the subject of the planning application.

2.11 What it is critical to stress is that the planning application for 61 dwellings only concerns part of the SL2163 site and proposes a quantum of development far less (25%) than the 241 dwellings the wider SL2163 site is said to be capable of accommodating in the future.

2.12 This is critical in the context of Kirklees' concerns regarding the perceived highways/constraints as their conclusions on these matters are predicated on the development of the entire SL2163 site and not the smaller development proposed as part of the submitted planning application.

2.13 The technical consultation summary of SL2163 set out within the Sustainability Appraisal clearly identified that the only reason that the site was rejected as a housing allocation related to highways/transport. I will therefore turn to this issue in more detail.

The Transport Statement

2.14 A Transport Statement was submitted in support of the planning application and set out the current highway situation including the effect of the proposals for 61 dwellings on part of SL2163 would have on the surrounding highway network. A copy of this report is attached at Appendix 2.

2.15 The Transport Statement concludes that; -

i) The site is located off Wellhouse Lane to the north of Mirfield and has no existing vehicular access. As such, an extension to Woodward Court, to the north east of the Site, is proposed.

ii) It is expected, using TRIC data forecasting, that circa 36 two-way trips will be generated during peak AM hours and circa 33 two-way trips during peak PM hours. This is one vehicle movement every two minutes during the worst peak hours of the day.

iii) The existing visibility splays at the junction of Woodward Court and Wellhouse Lane are acceptable based on existing 85th percentile speeds and achievable splays.

iv) The junction of Woodward Court and Wellhouse Lane is of an appropriate standard to serve the proposed development without resulting in any increased level of risk to highway or pedestrian safety.

v) Whilst there is not considered to be an existing highways safety issue in the local vicinity of the school it is proposed to incorporate raised tables to further reduce any existing risk and provide amenity for those accessing the school and further improving the safety of children and parents accessing the school on foot and by cycle. The raised tables are considered to be additional benefits to the wider highway network through the delivery of traffic calming measures at key pedestrian desire line crossing points in close proximity to the Primary School.

2.16 In light of this Transport Statement concluded that there are no overriding reasons preventing the local highway authority from recognising that the proposals are acceptable with regards to the traffic and transportation elements of the development.

Feedback from the Local Highway Authority

2.17 The Transport Statement has been reviewed in detail by the Local Highway Authority (LHA) who on the 22nd January 2018 issued the applicant some further highways queries for clarification. The following key elements were raised and will be addressed in a single comprehensive response to Kirklees Highways:

- Issue speeds surveys in a more legible format – This will be provided to Kirklees Highways;
- Kirklees suggestion that new waiting restrictions (TRO - Yellow Lining) may be required – The applicant has agreed to implement and pay for these works in line with Kirklees Highways preferences;
- Obtain and provide updated accident data for 2017 – This will be obtained however no 'new' patterns are expected from those in the TS;

- Consideration of Trip Rates and reviewing Kirklees proposed trip rates – If Kirklees trip rates were adopted, it is still concluded that the development would not result in a negative impact on the highway network. The increase in trip generation would be negligible;
- Further details on if the school peak pick up periods affect the proposals – Further detail to be provided to Kirklees Highways; and
- The requirement for a Stage 1 Road Safety Audit, reviewing the site layout and Wellhouse Lane / Wellhouse Court junction layout – This is being prepared and will be issued with a designer's response to Kirklees Highways.

2.18 A meeting was held with Kirklees Council and officers were positive in relation to highway considerations and they did not raise any matters of principle which would preclude the beneficial development of the site. The discussions with Kirklees Highways mainly involved the consideration of internal issues relating to the layout of the scheme and no matters of principle. It is considered by the Applicant's highways consultant that all outstanding highway queries can be suitably addressed to the satisfaction of the Highway Authority. In addition, the proposed residential development would still result in the Transport Statements original conclusion that the development would not result in a negative impact upon the highway network.

2.19 Based on discussions to date and feedback from officers of the LPA the Applicant considers that the planning application will be recommended for approval.

Amendments to the Local Plan

2.20 Turing back to Kirklees's assessment of SL2163 which states that *"Third party land required to achieve visibility splays. Hepworth lane is unsuitable for intensification"* in light of the above. It is clear that the proposed development can be brought forward without the need for third party land in order to achieve visibility splays and that the development of 61 dwellings on part of the SL2163 will not lead to an unsuitable intensification of Hepworth Lane or the rest of the surrounding highway network.

2.21 Indeed, paragraph 32 of the NPPF which states that *"Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are <u>severe</u>"* [my emphasis]. It is clear that the proposed development of 61 dwellings would not have a severe impact on highway capacity or safety and therefore should be not be prevent or refused on transport grounds.

2.22 The technical consultation summary of SL2163 set out within the Sustainability Appraisal (ref: SD5/EX14 - Appendix 2) states that the only significant site constraint (red score) is related to highways/transport. This assessment was predicated on an assessment of the entire SL2163 site and this resulted in the Kirklees allocating the site as Safeguarded land for future development and rejecting it as a housing allocation.

2.23 Despite the Council being made aware, both through the representation submitted in December 2016, pre-application discussions and the live planning application, that SL2163 is suitable for housing development, that the site is available and that development is achievable the Council have chosen to ignore this and allocate the site as a safeguarded land. As a consequence of this the Council has had to release more land from the Green Belt than necessary.

2.24 It has been demonstrated that part of the site can indeed be brought forward now, and that a development of 61 dwellings on part of SL2163 would not result in severe highways/access issues.

2.25 Paragraph 85 of the NPPF states that where necessary, LPA can identify in their plans areas of 'safeguarded land' between the urban area and the Green Belt, in order to meet longer-term development needs stretching well beyond the plan period. The part of SL2163 which is the subject of the live planning application is deliverable now, with a decision expected shortly. It would therefore not be justified or effective for Kirklees to allocate this land as Safeguarded Land and it would clearly be contrary to national policy. As such it is considered that this part of the site should instead be allocated for housing purposes.

3.0 Question b) Is the site available for development, and is there evidence of an active landowner/developer who is seeking to bring forward the site?

3.1 Bellway Homes are the landowners and in light of the above and specifically the submitted planning application, it is clear that the site is available for development and Bellway Homes are actively seeking to development part of the SL2163 now.

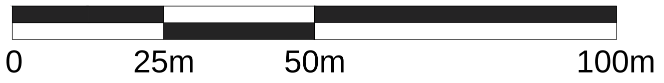
4.0 Modification

4.1 The site is suitable for housing development, development is achievable and the site is available. To avoid the release of excessive Green Belt land we consider that the site should be identified as a housing allocation as opposed to Safeguarded Land.

Appendix 1

Site Location Plan

Scaled @ 1:1250



REV:	DESCRIPTION:	BY:	DATE:

STATUS: For submission

STEN ARCHITECTURE

Suite 4, Unit 1,
Benton Office Park,
Bennett Avenue,
Horbury,
Wakefield,
WF4 5RA
Tel: 01924 669424

Web: www.sten-architecture.co.uk
Twitter: @STEN_arch
Facebook: stenarchitectureltd
Linkedin: Sten Architecture

CLIENT: Bellway Homes Ltd (Yorkshire)
First Floor, 2150 Century Way
Thorpe Park
Leeds, LS15 8ZB

SITE: Mirfield

TITLE: Location Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:1250	30.10.17	TS	BS

PROJECT NO:	DRAWING NO:	REVISION:
1731	1731.02	--

Appendix 2

Formal pre-app response to proposed development of SL2163

Kirklees COUNCIL

Planning
Investment and Regeneration Service
PO Box B93, Civic Centre 3,
Off Market Street, Huddersfield, HD1 2JR

Enquiries to: Matthew Woodward

Tel: 01484 221000
Email:
matthew.woodward@kirklees.gov.uk

Naz Parkar
Strategic Director
Economy and Infrastructure

Mr Mark Lane
DPP Planning
Second Floor
1 City Square
Leeds
LS1 2ES

Date: 01-06-2017
Our Ref: 2017/20095

Dear Sir,

Pre Application for erection of 60 units with associated access, drainage, landscaping and the provision of public open space and a school drop-off point

Land off, Woodward Court, Mirfield

Background

As part of the pre application advice service, we have consulted the following consultees who would be part of the decision making process should an application be received:

- Highways Development Management;
- Environmental Health;
- Flood Management and Drainage;
- Conservation and Design;
- Education;
- KC Ecology Unit;
- Strategic Housing;
- Crime Prevention;
- Landscape
- Public Rights Of Way

Policy

The following planning policies are applicable to this development:

Relevant policies are:

BE1 – Design principles
BE2 – Quality of design
BE12 – Space about buildings
BE23 – Crime prevention
D5 – Provisional Open Land
EP4 – Noise sensitive development
EP10 – Energy Efficiency
EP11 – Ecological landscaping
G6 – Land contamination
H1 – Housing needs of the district
H10 – Affordable Housing

Planning
Investment and Regeneration Service
PO Box B93, Civic Centre 3,
Off Market Street, Huddersfield, HD1 2JR

H12 – Arrangements for securing affordable housing
H18 – Provision of open space
NE9 – Retention of mature trees
T10 – Highway safety
T16 – Pedestrian routes
T19 – Parking standards
R13 – Rights of way

There are a number of policies in the Emerging Local Plan which now carry limited weight.

Supplementary Planning Guidance / Documents:

Interim Affordable Housing Policy (2016)

National Planning Policy Framework

History

2014/91282 – Erection of 135 residential properties with associated access, parking and landscaping and the creation of a car park to serve the school – Withdrawn.

Principle

The site lies on an area of Protected Open Land in the Kirklees Unitary Development Plan. At this stage the Council are unable to demonstrate a deliverable 5 year housing land supply. Therefore, in accordance with the NPPF, this is a relevant policy for the supply of housing which is considered out of date. In accordance with NPPF there is a presumption in favour of sustainable development and planning permission should be granted "*unless any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits when assessed against the policies in this framework taken as a whole, or that specific NPPF policies indicate development should be restricted"*.

In practical terms this means that there is a weighted balance in favour of housing development, largely on the basis of the Council's housing supply shortage, unless the adverse impacts of granting planning permission significantly and demonstrably outweigh the benefits.

Policy D5 of the UDP is considered to be a policy which precludes housing development, thus constrains the supply of housing in Kirklees. Consequently, the policy cannot be considered up-to-date. Nevertheless, it continues to carry some weight in the overall planning balance but the amount of weight attached is likely to be less than the weight afforded to policies in the NPPF which promote housing.

I am aware of a recent Supreme Court Judgment (Hopkins Homes v Suffolk Coastal District Council and Richborough Estates v Cheshire East Borough Council (Case no. C1/2015/0583 and C1/2015/0894) which provides further clarity on the application of paragraph 49 of the NPPF. Whilst I have not formed an opinion as to how this may affect any subsequent application on this site, my first reading of the Judgment suggests that it is unlikely to significantly alter the way in which the application is assessed in the context of paragraph 14, 49 of the NPPF and relevant (or not) policies for the supply of housing contained in the UDP. However, I recommend you consider this case as part of any subsequent planning application.

Consequently, based on the above and without prejudice, development on this protected open land is potentially acceptable in principle.

Planning
Investment and Regeneration Service
PO Box B93, Civic Centre 3,
Off Market Street, Huddersfield, HD1 2JR

Local Plan

The Kirklees Local Plan was submitted for Examination in April 2017 and is a material consideration. In accordance with paragraph 216 of the NPPF, weight can be given to the draft Plan, but the degree to which it weight can be attributed is determined by the stage the Plan has reached and the extent to which there are unresolved objections to it.

In the draft Local Plan the site is allocated as Safeguarded Land (Land to be safeguarded for potential future development). PLP6 of the Draft Local Plan details the policy. At this stage it is likely that only limited weight could be applied to this allocation but it is conceivable that the weight attached may increase as and if the Local Plan, in its current form, progresses through Examination and towards adoption.

I understand the land is likely to constitute Grade 3b agricultural land, in which case it will not fall under the Best and Most Versatile Agricultural Land definition in the NPPF. However, this should be clarified as part of any application submission.

Design

Broadly speaking the layout as proposed is considered to represent an appropriate response to the site. However, there are some issues for you to consider:

- Connections: the access is the only one that can be considered and as such is appropriate. The connection to the existing public footpath network provides opportunities to get to other areas especially what could be an attractive walk to the school.

- Facilities: the connections are considered appropriate and do promote walking and short travel distances, to nearby facilities which are proportionate to the development site.

- Public Transport: the development is close to public transport provision that provides access to outer areas. However, full details on public transport linkages should be clarified in any subsequent planning application.

- Character: there is nothing significant in terms of character in the area, the surrounding houses do not promote the need to deliver character areas within the site due to the scale of development. However, character can be provided by a mix of house type and elevational treatment. Support the fact that existing hedgerows and trees are to be retained which will ensure that the design will be tied to the landscape character of the area.

- Creating well designed streets and spaces: further details are required, for example elevations and boundary treatments for this to be fully acceptable. Houses should 'turn corners' and boundary treatment to road side need to be of high quality. The front of any property (fencing/garden/boundary treatment) is particularly important and helps to strongly define the character of a street. I am happy to discuss this in more detail when further detail has been developed.

- Easy to find your way around: this is achievable and can be evidenced by the elevation treatment of buildings on corners. Equally a detailed landscaping plan showing tree planting and boundary treatment onto the main road will help legibility.

- Streets for all: the side streets do offer the opportunity to reduce the vehicle speed by the use of parking bays and pinch points. The main access road does have a slight curve but a greater sense of enclosure through the use of planting will aid an equal reduction in speed.

- Public and private spaces: front gardens need to be delineated when semi-detached. Elevational treatments will indicate where there are opportunities for surveillance but there is little opportunity to look up and down a street from front elevations. In terms of the public spaces, these are well connected to the development even though they are to the rear and sides of the development.
- Pedestrian connections – Each dwelling should have a footpath which leads directly from the footway to the front door. Preferably, this should be separate from the driveway. However, if pedestrian access is proposed along the driveway, there should be a footway along the side of the driveway which is wide enough for pedestrians/wheelchairs/prams which provides a direct and unobstructed access to the footway.

Given the space within the site, I recommend increasing the distance between the proposed development and the dwellings on Hepworth Close in order to exceed the standard 21m distance normally recommended between facing habitable room windows.

Clarity is required on a number of other matters. I will forward comments from the Landscape/Open Space department in due course. However, I would be grateful if you would confirm the future use of the northern portion of land within the site. If this land is to be used as public open space, it will need to be properly incorporated into the layout. If the area of land is to be handed to the school, more detail will be required as to what this land would be used for and how it would be secured.

Similarly, confirmation is needed as to whether the pick up/drop-off area would be provided and how it would operate in practice. If it is to remain, further consideration will need to be given to ensuring that it is properly incorporated into the layout. Particular attention should be given to appropriate landscaping.

Heritage

Balderstone Hall is a Grade II listed building(s) which fall within the wider Protected Open Land allocation within which this site is situated. Paragraph 131 sets out the context by which applications for planning permission should be assessed taking into account the impact on heritage assets.

Any subsequent planning application should be accompanied by a Heritage Statement so that the setting of the heritage asset (and any other assets within the site vicinity) can be fully understood; and how the application has been designed to respond to heritage assets.

Any impact on the setting of Balderstone Hall would require an assessment against policies in the NPPF which may be considered restrictive (see footnote '9', page 4 of the NPPF).

Highways

One of the key considerations is likely to be the impact on the highway network and on highway safety. The Transport Assessment scope has been discussed and agreed with the Transport Consultant on 28.03.2017.

Following an initial meeting with the Council, additional highway detail was submitted to the Council and this was entitled "Proposed Traffic Calming Measures and Benefits Delivered to Woodward Court and Wellhouse Lane".

In respect of this document and the highway safety proposals contained within, the Council's highways section have made the following general comments:

1. *Highways Safety are generally not in favour of introducing traffic calming features as a mitigation against poor junction visibility. However, HS accept it is a means to facilitate development at difficult sites subject to the applicants highways consultant demonstrating the benefits gained are sufficient.*

2. *HS question the reasoning behind the plateaux elsewhere on Wellhouse Lane. There are no logged complaints about speeding in recent years, and there is no accident issue. HS consider features would be ineffective at busy times, as the large volume of moving and parked vehicles is an effective calming feature than a plateau. It is difficult to predict what residents' views would be on the suggestion.*

3. *It is not common practice to provide plateaux to assist pedestrians crossing the road – HS would usually rely on School Keep Clear markings and dropped kerbs at sites of this nature.*

In respect of the wider highways considerations, the following points are pertinent to any future application:

In line with the councils parking policy the following parking provision should be provided:
2 - 3 bedroom dwelling: 2 spaces
4+ bedroom dwelling: 3 spaces
1 visitor space per 4 residential units
1 cycle space per residential unit (desirable)

Garage dimensions (Internal):

Single: 6.0m long x 3.0m wide
Double: 6.0m long x 5.0m wide
1 electric vehicle charging connection point per dwelling (normally within a garage).

The internal layout should be designed to maintain vehicle speeds of 15 -20 mph, this ideally should be achieved through horizontal alignment.

The two turning heads at the north east end of the site should be linked together to form a circular route, this will remove isolation for residents and ensure refuse collection is carried out more efficiently. A plan with vehicle swept paths for refuse collection vehicles 11.85m in length, and two way

There is currently no mention of how the site will facilitate drainage, more information is required to enable an informed assessment on this matter.

There is currently no provision for refuse storage within the property boundaries or refuse collection points. Before development commences details of storage and access for collection of wastes from the premises will need to be provided.

The proposed footpaths on the open space area could potentially make the existing Public Right Of Way (PROW) redundant and a maintenance issue, consideration should be given to stop up the existing or utilise the PROW.

Kirklees Council no longer adopt footpaths in new developments, as a result further information is required on the maintenance/liability procedures to be undertaken.

The proposed drop off car parking area has a PROW linking into it, further information regarding this will be required in terms of any resurfacing or street lighting proposals.

Planning
Investment and Regeneration Service
PO Box B93, Civic Centre 3,
Off Market Street, Huddersfield, HD1 2JR

Plans detailing the proposed internal adoptable estate roads shall be submitted and approved in writing by the Local Planning Authority. The scheme shall include full sections, drainage works, street lighting, signing, surface finishes and the treatment of sight lines, together with an independent safety audit covering all aspects of work.

These comments should be read in conjunction with the e-mail sent to you dated 12th April 2017 (attached for completeness).

Ecology

Comments attached. Given the scale of the proposed green space area and the immediate surroundings, there are numerous opportunities for ecological enhancement.

Drainage

This site is located in main river flood zone 1 – Low Risk Flood Risk Assessment. The site is however greater than 1 hectare and therefore a formal Flood Risk Assessment will be required. This should concentrate on surface water flood risk and mitigation and include consultation with the Lead Local Flood Authority. A key aspect should be flood routing pre and post design with justifications over layouts. Routing should utilise road network and public open space and avoid curtilage. Submissions on drainage strategies should be in accordance with West Yorkshire Combined, Authority Guide to SUDS.

Third generation surface water flood risk maps only show a flow through site for the 1 in 1000 year event which is north west to south east and potential ponding near the site entrance. The 1 in 100 year event does not reveal any risk.

Local report of flooding on Kirklees records include Flash Lane in 2012 attributed to blocked gullies. Several reports at the bottom of St. Mary's Avenue associated with failing drainage infrastructure. An isolated incident occurred in Shill Bank Lane 2010. None of these incidents we believe lead to influence or be influenced by the site development.

Surface Water Drainage Strategy

The application should follow the surface water hierarchy of disposal in line with West Yorkshire Combined Authority guide to SUDS. Neither Yorkshire Water nor Kirklees Council currently adopt SUDS features from properties. This will remain private or be managed by a private management company should the developer chose to pursue such options. The Highways department will consider soakaways providing adequate space is made for ease of maintenance and protection of the road construction and clear safe flood routing in the design. Early dialogue with our section 38 team is advised.

BGS data suggests that infiltration techniques could work on this site. Although no soakaway design guide is available at this moment in time, various guides are available. We would expect a detailed examination for this site on re-emergence given neighbouring properties are at lower levels. We would expect soakaways to be constructed within a reasonable depth of competent strata (various guides state 1-3 metres). Coal workings and potential grouting need to be taken into account. Due to the size of the site, seasonal testing will be required. BRE Digest 365 should be followed for testing procedures but the design should be in line with all other NPPF drainage guidance on the 1 in 30 and 1 in 100+ climate change events. We will be advising the planning officers to involve Leeds Council Geotechnical as an advisory due to the scale of the site.

Planning
Investment and Regeneration Service
PO Box B93, Civic Centre 3,
Off Market Street, Huddersfield, HD1 2JR

Should infiltration technique prove problematic alternative outfalls should be sought.

There are no known watercourses in the immediate vicinity of the site. Public surface water sewers are located in Hepworth Lane and Shillbank Lane. They appear to show downstream connections to combined sewers that are also available. We advise planning officers that should sewers be considered that capacity issues as declared to Ofwat under DG5 regulations should be examined.

Flood Routing

It is expected that the design should account for flood routing from exceedance event for any attenuation tanks, shared soakaways in public open space, highway soakaways. An examination of blockage scenarios is expected which basically includes short duration intense events where water may not readily enter gullies. The layout should avoid property in basins or low spots inviting routes through curtilage. A view will be taken on short cul-de-sacs in this respect as not being reasonably practicable to achieve, however the road network and public open space should be used as conduits/storage.

Temporary Drainage

A scheme to protect surround properties from run off in the construction phase will be expected. This scheme should also protect local drainage networks from mud, silt and pollution associated with site materials.

Maintenance and Management

The LPA is obligated to ensure that SUDS are maintained and managed for the lifetime of the development. This could therefore involve management companies for the period up to adoption or for the life of the development. In order to enforce against this obligation, a section 106 agreement/undertaking maybe required.

Comments on the submitted drainage scheme

The fact there is a spine road north to south aids routing. As long as the roads off it fall away to either side and don't dip in the middle, there should be no problems.

I'm a little concerned with what looks like a huge basin at the bottom. Soakaways should be separate for highways and spread out.

There will be some shared soakaways (given it won't work in some areas) but again spread it out as much as possible and these need a management company to run them. Individual soakaways will be for home owner to look after. If you can tie everything into a management co. then fine.

The drainage officer would not be happy running everything to bottom of the site and having a huge wet area right on the boundary with other properties which are at lower levels. He would much prefer this as a belt and braces safety are, i.e. a back up if flows came off the built up area.

Education

In response to the above application the calculation shows that an education contribution of £293,367 is required.

Affordable Housing

The application would require a scheme of 12 affordable units. Full comments from the Council's Strategic Housing are attached.

Other Environmental Impacts

Comments from Environmental Health are attached. A development on this scale would trigger the requirement for a Travel Plan and electric charging points (1 per unit), in accordance with the West Yorkshire Low Emission Strategy Planning Guidance.

Consultation

As you know, there was a previous planning application on this site (2014/91282). If you require a summarised copy of comments/representations relating to this application then please let me know. As I am sure you will appreciate, there were significant local concerns relating to the previous application and it is important you demonstrate in any submission how you consider the previous objections have been addressed by any subsequent application.

Any planning application should be accompanied by a Statement of Community Involvement which describes how the scheme has considered comments received from the community. A Design and Access Statement should be prepared which identifies how each element of the scheme has been designed, and how each component parts of the proposed development fit together.

Conclusion

The proposed development is considered to be acceptable in principle and, subject to the issues above being addressed, it is likely to be viewed as a sustainable form of development. However, the advice contained within this letter whilst given in good faith, is provided without prejudice to an assessment of any future planning application would be assessed on its own planning merits.

A copy of the Council validation requirements are attached to this letter.

Yours faithfully

David Wordsworth
Major Applications Team Leader

Appendix 3

Transport Statement submitted in support of the live planning application

WELLHOUSE LANE, MIRFIELD

TRANSPORT STATEMENT

NOVEMBER 2017

CONFIDENTIAL

REPORT NO 20042-001

WELLHOUSE LANE, MIRFIELD

TRANSPORT STATEMENT

Bellway Homes (Yorkshire) Limited

Final Draft Issue
Confidential

Project no: 20042-001

Date: November 2017

Andrew Moseley Associates

No 1 Aire Street
Leeds, LS1 4PR

www.amatp.co.uk

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Final Issue			
Date	03.11.2017			
Prepared by	DC			
Checked by	AM			
Authorised by	AM			

PRODUCTION TEAM

AMA

Director	Andrew Moseley

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

Appendix A Indicative Site Layout and Access Proposals

Appendix B Proposed Site Access Junction Visibilities

Appendix C Automatic Traffic Count Data

Appendix D 2011 – 2016 Accident Data Plot

Appendix E Speed Table

Appendix F Traffic Calming Paper ' Road Humps Should Be Dug Up – The Case Against'

Appendix G Traffic Calming Research Extract – 'Civilised Streets: A Guide to Traffic Calming'

Appendix H Trics Output Data

Appendix I Flow Scenarios

1 INTRODUCTION

1.1 OVERVIEW

1.1.1 Andrew Moseley Associates (AMA) has been commissioned by Bellway Homes (Yorkshire) Limited (hereafter Bellway Homes) to produce this Transport Statement (TS) in connection with the submission of a full planning application for the residential development of 61 dwellings at Wellhouse Lane, Mirfield. The location of the site is shown at **Figure 1**.

1.1.2 The purpose of this report is to review the local highway network and the sustainable accessibility of the proposed development site and to assess the development in a local transport context.

1.2 REPORT STRUCTURE

1.2.1 The structure of the report is set out as follows;

- Section 2 - describes in detail the site location and the local highway network in the vicinity of the proposed development site;
- Section 3 – sets out the development proposals including the proposed access / egress arrangements and car parking;
- Section 4 – summarises national, regional and local transport policies relevant to the site and describes how the proposed development accords with these;
- Section 5 – describes existing and proposed sustainable transport infrastructure in and around the proposed development site;
- Section 6 – sets out the estimated traffic generation of the future development, including an assessment of the estimated impact of the development on the local highway network;
- Section 7 – provides a summary of this Transport Statement derived from the review and analysis se out in the above Sections.

2 EXISTING CONDITIONS

2.1 SITE LOCATION

2.1.1 The site is located in a predominantly residential area to the north of Mirfield, approximately 10km to the north east of Huddersfield Town Centre and approximately 6km to the west of Dewsbury Town Centre. The proposed development site is bound to the north by Crossley Fields Junior and Infant School, to the east by undeveloped land, to the south by residential dwellings and Hepworth Lane, and to the west by residential dwellings and Wellhouse Lane. The location of the site and the immediate roads surrounding are provided in Figure 1.

2.1.2 There is no existing vehicular access into the site but pedestrian access can be gained via Hepworth Lane from the most southerly boundary on to a Public Right of Way (PROW).

2.2 LOCAL HIGHWAY NETWORK

2.2.1 Woodward Court will provide vehicular access into the development via the existing public highway. The public highway currently bounds the site to the east of Woodward Court and to the north western extreme of the site. Woodward Court provides access to residential properties off Wellhouse Lane. Woodhouse Court is a single lane carriageway, is well lit, and has footways present on both sides of the carriageway.

2.2.2 Wellhouse Lane is a single lane carriageway two way road which is subject to a 30mph speed limit. To the north of the site, Wellhouse Lane provides access to Crossley Fields Junior and Infant School and further to existing residential developments. A “drop and go” area is present along the school’s frontage. To the south of the site Wellhouse Lane provides through access to Hepworth Lane and Flash Lane. To the south of the Wellhouse Lane / Woodward Court priority T-junction a footway is present along the southbound carriage way. To the north of the identified junction, footways are present along both sides of the carriageway.

2.2.3 At a wider, strategic, level the A644 Huddersfield Road runs to the south of the proposed site through Mirfield. The A644 is a single lane carriageway two way road subject to a 30mph speed restriction, has footways present along both sides of the carriageway, has a cycle path located along the eastbound carriageway and is well lit. To the east the A644 provides direct access to Dewsbury Town Centre, and to the west the A644 provides access to Brighouse Town Centre

3 PROPOSED DEVELOPMENT

3.1 HIGHWAYS SCOPING

3.1.1 The development proposals have been fully scoped with highways officers at Kirklees Council Highways as part of the planning pre-application process with the scope of the TS mutually agreed. This TS provides the agreed detail as part of the scoping process in line with Kirklees Council's requirements.

3.1.2 It was concluded as part of the scoping exercise that the estimated trip generation and thus the highways impact would not be of a level that would result in a significant impact on the local highway network. As such it was agreed that no junction capacity assessments would be required.

3.2 SITE LAYOUT

3.2.1 The proposed development comprises 61 dwellings with associated parking. A copy of the proposed site layout is included in Appendix A.

3.2.2 The internal layout of the site has been designed in accordance with West Yorkshire Residential Design Guide and is capable of accommodating emergency and refuse vehicles.

3.3 ACCESS ARRANGEMENTS AND EXISTING VISIBILITY SPLAYS

3.3.1 It is proposed that the development is accessed from Woodward Court by a suitable residential access road in line with Kirklees Residential Highways Design Standards. Woodward Court takes access to the local highway network through an existing priority junction with Wellhouse Lane.

3.3.2 PL-2004-001 in **Appendix B** details the existing access junction at Wellhouse Lane / Woodward Court and achievable visibility splays to the nearside kerbs, generally the standard for a 30mph road according for Manual for Streets should be 2.4m x 43m.To the north 2.4m x 43m can be achieved and to the south 2.4m x 30m can currently be achieved.

3.3.3 PL-2004-002in **Appendix B** however shows that visibility splays to a vehicle approaching from the south if measured to an oncoming vehicle would be 44.7m, in excess of the desirable standard. It is considered that due to the alignment and curvature of Wellhouse Lane when approaching and passing Woodward Court that there would be no occurrences of overtaking vehicles on Wellhouse Lane and that the splays achievable are appropriate and acceptable to accommodate the development proposals without a detrimental impact on highways safety.

3.3.4 To ensure the suitability of the proposed splays, speed surveys have been collected during two separate survey windows and are fully detailed in the following subsection.

3.3.5 Pedestrian footpaths are located around the perimeter of the proposed residential development providing links to existing footpaths to the north east of the site. An additional footpath is located to the southern extent of the site, providing pedestrian access onto Hepworth Lane.

3.4 SPEED SURVEY DATA AND VISIBILITY SPLAYS

3.4.1 For clarity and robustness, speed surveys at the extent of the required splays (i.e. 43m from the site access junction) have been obtained on two separate occasions to determine splay requirements.

3.4.2 As previously submitted to the Council by Sanderson Associates, on 26th November 2013 speed surveys were undertaken by radar gun at the priority junction of Woodward Court / Wellhouse Lane separating peak periods from free flowing traffic and the school pick up PM Peak. The recorded speeds are provided in Table 3.1.

Table 3-1 2013 Speed Survey Data at Woodward Court / Wellhouse Lane Priority Junction

Time Period	Direction of Travel	Number of Readings	Adjusted 85th Percentile Wet Weather Speed	Resultant MfS SSD / Visibility Requirement (Y-Distance)
13:07 – 15:38 and 15:45 – 17:48	Southbound	101	23.3mph	28m
14:38 – 15:45	Southbound	37	20.1mph	22m
13:07 – 14:38 and 15:45 – 17:48	Northbound	100	27.4mph	34m
14:38 – 15:45	Northbound	66	23.8mph	29m

3.4.3 Table 3.1 therefore demonstrates that the proposed splays at the junction are suitable to accommodate the proposed development.

3.4.4 For robustness a further 7 day survey was undertaken by two Automatic Traffic Counters (ATC) located at the extent of each of the splays between Wednesday 30th November 2016 and Tuesday 6th December 2016 (Full results are provided in **Appendix C**).

3.4.5 The results of the survey are detailed in Table 3.2.

Table 3-2 2016 Speed Survey Data at Woodward Court / Wellhouse Lane Priority Junction

Time Period	Direction of Travel	Adjusted 85th Percentile Wet Weather Speed	Resultant MfS SSD / Visibility Requirement (Y-Distance)
7 Day Survey	Southbound (At Northern Splay Extent)	25.4mph	31m
7 Day Survey	Northbound (At Southern Splay Extent)	29.7mph	43m

3.4.6 Table 3.2 therefore demonstrates that the proposed splays at the junction are achievable to the nearside kerb to the north. To the south a 30m splay is currently is achievable to the nearside kerb, however due to the alignment of Wellhouse Lane past Woodward Court, no vehicles are considered to ever approach the junction in the nearside lane. Therefore, measurement of the splay from the junction to the front of approaching vehicles is an appropriate measurement of visibility from the junction, therefore in excess of 43m can be achieved and is considered to be acceptable.

3.4.7 **Appendix D** shows a summary of road traffic accidents during the period 2011 – 2016 in the vicinity of the Woodward Court / Wellhouse Lane priority junction suggesting that during this period no accidents have occurred. As part of the TS we have sourced the latest data from the LHA, which suggests that the existing junction does not have any existing accident issue. Therefore, based on the findings of the speed surveys and achievable splays it is not considered that the proposed development would increase or adversely affect the existing highways situation or result in any detrimental impact of highways safety.

3.5 PROPOSED TRAFFIC CALMING AND BENEFITS DELIVERED

3.5.1 The previous sections have detailed that the existing visibility splays from Woodward Court are considered to be acceptable. However, in addition the development proposes what are considered to be additional benefits to the wider highway network through the delivery of some traffic calming measures at key pedestrian desire line crossing points in close proximity to the Primary School. This includes the Raised Table junction of Woodward Court / Wellhouse Lane and other Raised Tables at other locations as identified at **Appendix E** (Drawing PL-20024-004). The cost of these improvements would be borne by the applicant.

3.5.2 Provision would assist in reducing both average and 85th percentile speeds in the vicinity of the school and the proposed site access further improving existing highway conditions and a reduction in any vehicle / pedestrian conflicts. Whist there is not considered to be an existing highways safety issue in the local vicinity of the school these proposed raised tables will further reduce any existing risk and provide amenity for those accessing the school and further improving the safety of children and parents accessing the school on foot and by cycle. The benefits of such schemes are detailed in the following subsections.

TRAFFIC CALMING PAPER- "ROAD HUMPS SHOULD BE DUG UP: THE CASE AGAINST"

3.5.3 Research has been extracted from the Traffic Calming Paper "Road Humps should be dug up: The Case Against" as attached at **Appendix F** which details the results of numerous traffic calming study. Research undertaken by Webster and Mackie (1996) looked at the effect of traffic calming, in this study 52% of measures were round-top humps and 30% flat-top humps which were mainly 75 or 100mm high. Raised Table junctions accounted for 10% and speed cushions for 4% with the remainder of measures including mini-roundabouts, chicanes and rumble strips.

3.5.4 The conclusions from the research were that:

- Average annual accident frequency had fallen by about 60%
- Child pedestrian and child cyclist accidents fell by 70 and 48 per cent respectively;
- Speed data showed that average speed 'at a calming measure' was 13.2mph and 'between calming measures' was 17.8mph, with overall vehicle speeds falling by, on average, 9.3mph;
- There was a 6.2% reduction in accidents for each 1mph reduction in vehicle speed;
- Traffic flows were reduced on average by 27% in the zones and there were increases on surrounding roads of approximately 12%;
- Accident migration was not found to be a problem although care should be taken to avoid traffic transferring to unsuitable routes; and
- Overall reactions from residents were generally in favour of the schemes.

3.5.5 It is also important to note that traffic calming is popular with residents. TRL Report 311 reviewed forty UK and five non-UK surveys of public responses to traffic calming measures. Most of the schemes were on roads with 20 or 30 mph speed limits. Sample sizes in most studies were 50 - 500 respondents, with a maximum of 1000. The overall percentage of respondents who approved of the schemes was 65%.

3.5.6 The Traffic Calming Paper concludes that traffic calming has a part to play in the overall management of speed in urban areas to reduce casualties and improve the quality of life for all road users.

CIVILISED STREETS: A GUIDE TO TRAFFIC CALMING

3.5.7 In addition, research has been extracted from 'Civilised streets: A Guide to Traffic Calming' and is provided in **Appendix G** which details on Page 72 (and Table 13 on Page 73) that the study considered 85th percentile vehicle speeds before and after traffic calming schemes were implemented on 35 individual sites. The research study identified a mean reduction of 10mph on 85th percentile speeds was achieved, leading to a reduction in both accidents post implementation and improvements to existing highways safety.

3.5.8 On this basis it is considered that should traffic calming measures through speed / crossing tables be installed in the vicinity of the site, that existing 85th percentile speeds could see a mean decrease in speed of 10mph past the school and proposed site access onto Wellhouse Lane.

3.5.9 When considering this against the 85th percentile speeds recorded in the 2017 ATC surveys for the Woodward Court / Wellhouse Lane priority junction splays, this would result in speeds (when adjusted for wet weather and reducing these by the mean of 10mph) Southbound as low as 15.4mph (MfS requiring a 16m splay) and Northbound as low as 19.7mph (MfS requiring a 22m splay). Therefore, should speed / crossing tables be installed speeds would be reduced. In turn visibility splays to the nearside kerb from Woodward Court to the south would be achievable well within typical MfS standards.

3.5.10 The proposed calming would therefore improve existing highways conditions, further reducing any potential highways risks in the vicinity of the school particularly at key crossing locations.

3.6 PARKING

3.6.1 Parking for the residential dwellings has been provided in line with the parking standards currently being progressed through KC's Unitary Development Plan (UDP), as follows:

- Houses <140m^2 – 2 allocated spaces per dwelling
- Houses >140m^2 – 3 allocated spaces per dwelling

3.6.2 Cycle parking will also be provided in line with current standards; one cycle space per dwelling

4 TRANSPORT POLICY

4.1 POLICY BACKGROUND

4.1.1 The preparation of this TS is consistent with national transport policy guidance set out in the National Planning Policy Framework (NPPF) which advocates the submission of such documents to support applications for new developments, which generate significant amounts of movement.

4.1.2 The NPPF also notes that:

> *"In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport."* ***(paragraph 30)***
>
> *"Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised."* ***(paragraph 34)***

4.1.3 Section 5 of this report highlights the existing sustainable transport provision within the vicinity of the site and demonstrates that the proposed residential development will be well located in terms of its proximity to key services and to offer the opportunity to use sustainable travel modes.

4.1.4 The Local Transport Plan (LTP) for West Yorkshire became active from the 1st April 2011. It sets out the transport vision, goals, challenges to be tackled and a strategy covering the 15 year period to 2026. The plan has been developed in partnership with five West Yorkshire District Councils, Bradford, Calderdale, Kirklees, Leeds and Wakefield.

4.1.5 The Vision is to offer people a great place in which to live, work, invest and visit. The vision sets out to connect people and places by "working together to ensure West Yorkshire's transport system connects people and places in ways that support the economy, the environment and quality of life".

4.1.6 The Local Transport Plan has three main objectives, set out below:

- Economy. To improve connectivity to support economic activity and growth in West Yorkshire and the Leeds City Region.
- Low Carbon. To make substantial progress towards a low carbon, sustainable transport system for west Yorkshire, while recognising transport's contribution to national carbon reduction plans.
- Quality of Life. To enhance the quality of life of people living in, working in, and visiting West Yorkshire.

4.1.7 This TS includes a detailed appraisal of the impacts of the development proposals upon the surrounding highway network and demonstrates that the proposals will not have a significant detrimental impact.

4.1.8 It is therefore considered that the application proposals are acceptable and consistent with current national and local transport policies. Further details of the relevant planning policy background are set out in the planning statement which also accompanies the application.

5 EXISTING SUSTAINABLE TRANSPORT PROVISION

5.1 INTRODUCTION

5.1.1 The Government's objectives set out in the NPPF are to ensure that new developments are provided in sustainable locations, where the need to travel is minimised and the use of sustainable modes can be maximised.

5.1.2 The site has a good level of accessibility by sustainable modes of transport which will encourage the use of alternative modes of travel.

5.1.3 This section outlines the existing walking, cycling and public transport facilities within the vicinity of the development site and describes the accessibility of the site in terms of its proximity to key services and destinations.

5.2 PEDESTRIAN/CYCLE ACCESS

5.2.1 Walking is recognised as the most important mode of travel at a local level in that it offers the greatest potential to replace short car trips, particularly those under two kilometres. As such, consideration has been given to the existing pedestrian facilities in the vicinity of the proposed development. A plan showing the 2km walking catchment from the centre of the site is attached in **Figure 2**.

5.2.2 The plan attached at **Figure 2** shows that areas within the 2km catchment area include, Norristhorpe to the north, Ravensthorpe to the east, Mirfield Town Centre to the south, and residential areas of Mirfield to the west, within which are a range of facilities.

5.2.3 Footways are proposed on both sides of the principle spine road which will connect into the existing footways on Wellhouse Lane, Hepworth Lane and the surrounding streets, providing a safe route from the site to these local facilities.

5.2.4 Cycling has the potential to substitute for short car trips, particularly less than five kilometres. As such, those areas and facilities within a reasonable walking distance can also be considered to be within a reasonable cycling distance. The plan attached at **Figure 3** shows the 5km cycling catchment from the site. The plan identifies that Dewsbury Town Centre to the east, Bradley to the west and Batley to the North are situated within a 5km cycling distance of the application site.

5.2.5 National Cycle Routes are present within the vicinity of the site, including both on-road and traffic-free routes. National Cycle Route 66 runs in an east-west direction along parts of the A644 before travelling north through Dewsbury Country Park. The 66 route provides access to Bradford in the north and Huddersfield in the south. The National Cycle Route 69 and 699 provide access to Dewsbury and later Ossett to the east of the proposed development. A copy of the cycle route plan is attached at **Figure 4**.

5.3 PUBLIC TRANSPORT

5.3.1 The proposed development site is well located in terms of its proximity to public transport services, including the existing bus services which run along Greenside Road, Flash Lane and Shillbank Lane to the south and west of the site. Details of the existing provision are set out below.

BUS SERVICES

5.3.2 Four bus stops are located within 400m of the proposed development site, as shown on the plan attached at **Figure 5**. Two bus stops are located on Shillbank Lane; "Shillbank Lane Hepworth Lane" and "Shillbank Lane Balderstone Hall", which can be accessed by foot via the proposed pedestrian access point. Both Shillbank lane bus stops are situated approximately 150m to the east of the site and are equipped with bus timetables and raised kerbs. Two further bus stops are located approximately 300m to the west of the site on Greenside Road; "Greenside Road Shepley Road" and "Greenside Road Shepley Mount". Greenside Road bus stops can be accessed by foot via Woodward Court, Wellhouse and Greenside Road.

5.3.3 The bus stops are served by the buses summarised in Table 5.1.

Table 5-1 Local Bus Services

SERVICE	ROUTE	MONDAY – FRIDAY	SATURDAY	SUNDAY
205	Dewsbury - Mirfield	Every hour	Every hour	N/A
MAX 202	Leeds - Huddersfield	Every 30 minutes	Every 30 minutes	Every hour

5.3.4 As set out in Table 5.1 bus services 202 and MAX 205 have a combined service frequency of three buses per hour during weekdays and Saturdays and one service per hour on Sundays. These buses provide access to areas including Leeds City Centre, Huddersfield City Centre, Dewsbury Town Centre and other nearby towns and villages.

5.3.5 Additional bus services are located along Old Bank Road, these services are summarised below in Table 5.2.

Table 5-2 Additional Bus Services on Old Bank Road

SERVICE	ROUTE	MONDAY – FRIDAY	SATURDAY	SUNDAY
221	Mirfield – Leeds	Every hour	Every hour	N/A
253	Dewsbury - Bradford	Every hour	Every hour	Every hour

5.3.6 As set out in Table 5.2 the bus services 221 and 253, along with those identified in Table 5.1, have a combined service frequency of five bus services per hour on weekdays and Saturdays and two services on Sundays.

5.3.7 Bus stops located along Old Bank Road "Old Bank Road Sunny Bank Avenue" (eastbound) and "Old Bank Road Sunny Bank Avenue" (westbound) and equipped with bus shelters, timetables, and raised kerbs.

RAIL SERVICES

5.3.8 The nearest railway station to the development site is Mirfield, which is located approximately 2.4km to the south of the site. Although Mirfield Rail Station is slightly over the recommended walking distance from the proposed site, it is anticipated that future residents of the site would and could feasibly walk to the station.

5.3.9 Cycle provision at Mirfield rail station includes 24 storage spaces, 4 of which are cycle lockers and the remaining 20 are cycle stands. The cycle parking facilities are also equipped with CCTV. Additional services at Mirfield Rail Station include free car parking for 35 spaces, and the provision of a ramp for train access.

5.3.10 The station is a small sized transport hub with direct services running to six locations. These destinations are set out below in Table 5.3.

Table 5-3 Mirfield – Direct Rail Services

Destination	Train Operator	Monday – Friday	Saturday	Sunday
Leeds	Northern	Every 30 minutes	Every 30 minutes	Every 2 hours
Huddersfield	Northern	Every 30 minutes	Every 30 minutes	Every 2 hours
Wakefield Westgate	Northern	Every hour	Every hour	N/A
Manchester Victoria	Northern	Every hour	Every hour	N/A
Bradford Interchange	Grand Central Railway	4 per day	3 per day	3 per day
London Kings Cross	Grand Central Railway	4 per day	3 per day	3 per day

5.4 LOCAL FACILITIES

5.4.1 There are a number of local facilities and amenities within a 25 minute walk (2,000m) of the application site including Mirfield Town Centre, northern and western extents of Raventhorpe, and southern extents of Norristhorpe.

- **Mirfield Town Centre** – Is home to a range of facilities and amenities including food stores, banks, pubs, restaurants and cafés, medical facilities, a library, leisure facilities and two post offices. All services and facilities are located within 2km from the proposed development site and can be accessed via walking, cycling and public transport.

- **Food Shopping** – The site is within walking distance of many newsagents, food stores and supermarkets within Mirfield. Within close proximity to the proposed development, a One Stop is located on Greenside Road, The Co-operative is located on Old Bank Road, and a newsagents and off-licence is located on Lee Green.
- **Health Care Facilities** – A wide range of health care facilities are located within 2km of the proposed development site. These facilities include two Dentists located on Taylor Hall Lane and on the A644 Huddersfield Road, three pharmacies located on Old Bank Road, Doctors lane and the A644 Huddersfield Road, and a health Centre located on Doctor Lane. Additional health care facilities and services can be found in Dewsbury Town Centre and Huddersfield Town Centre, which can be accessed via public transport.
- **Leisure Facilities** – Within walking distance of the proposed development, facilities include several recreation grounds and parks. Additional services in Dewsbury and Huddersfield include swimming pools, fitness gyms and leisure centres, which can be accessed by public transport.
- **Education** – Crossley Fields Junior and Infant School borders the northern boundary of the proposed development site. Additional schools located in Mirfield include; Old Bank Junior, Infant and Nursery School located on Old Bank Road, Battyeford Primary School located on Nab Lane, Crowlees C of E Junior and Infant School located on Knowl Road, The Mirfield free Grammar and Sixth Form located on Kitson Hill Road, and Castle Hall Academy located on Crowlees Road, all of which are within the recommended walking distance of the development site. The University of Huddersfield is a higher educational facility located in Huddersfield Town Centre, which can be accessed via public transport.
- **Huddersfield Town Centre** - has a large range of employment facilities including offices, retail, and leisure, a range of shops, banks, a post office, a library, pubs, restaurants/cafes, leisure facilities, medical facilities and regular markets, all of which are all accessible via public transport.

5.5 SUMMARY

5.5.1 A review of the existing facilities for access to the site by a range of non-car modes has been carried out. This demonstrates that there are an extensive range of existing facilities to accommodate pedestrian, cycle and public transport trips to the site following development. The existing facilities for access by non-car modes also provide sustainable access from the site to a range of existing local services in surrounding areas.

The site is therefore considered to be in a sustainable location for access by non-car modes in line with local and national planning policy.

6 POTENTIAL DEVELOPMENT IMPACTS

6.1 INTRODUCTION

6.1.1 This section sets out the methodology used to estimate the number of trips that are expected to be generated by the proposed development site and the impact of the proposed development on the local highway network, based on provision of 61 residential dwellings.

6.1.2 The development traffic generation has been calculated using the industry standard Trip Rate Information Computer System (TRICS) database. TRICS provides a database of similar developments in a variety of locations in order to provide the best possible proxy for the development site.

6.1.3 To simulate the proposed development, the figures derived from TRICS have been based on residential sites that are closely related to the development site and as such criteria was set for residential land use for privately owned houses across England, Scotland and Wales (excluding Greater London and Ireland).

6.2 DEVELOPMENT TRAFFIC GENERATION

6.2.1 The proposed AM and PM weekday peak hour vehicle trip rates for the development have been derived from TRICS and are summarised in Table 6.1 below. Based upon an understanding of the highway network peak, the time periods of 08:00 to 09:00 and 17:00 to 18:00. Trip rates are per dwelling and have been multiplied by the number of dwellings to produce vehicle trip generations during peak hours. A copy of the TRICS output is provided in **Appendix H**.

Table 6-1 Vehicle Trip Rates and Generation

Destination	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Trip Rates	0.167	0.401	0.361	0.176
Trip Generation	11	25	22	11

6.2.2 Table 6.1 demonstrates that the development proposals are forecast to generate the following vehicular trips during the highway network peak hours:

- AM Peak - Arrivals – 11 / Departures – 25 / Two-way 36
- PM Peak - Arrivals – 22 / Departures – 11 / Two-way 33

6.2.3 In both peak periods, the trip generation would result in approximately one vehicle movement every two minutes, this is considered to be negligible.

6.3 DEVELOPMENT TRAFFIC AND DISTRIBUTION

6.3.1 Development traffic distribution has been undertaken based upon existing (2011) travel to work data for the Kirklees 020 Middle Layer Super Output Area (MSOA), in which the site is situated. This method uses Office of National Statistics data and can be considered a robust approach.

6.3.2 The traffic distribution has been applied to the forecast trip generations to estimate the change in traffic flows on the highway network as a result of the development at the site. Consideration of the traffic distribution exercise shows the total change in traffic flows that is forecast on the road network as a result of the development proposals.

6.3.3 The distribution exercise is summarised in Tables 6-2 to 6-5 which consider traffic distribution at the four junctions within the vicinity of the development site.

Table 6-2 Site Access Distribution

DESTINATION	PROPORTION
Wellhaouse Lane (N)	56%
Wellhaouse Lane (S)	44%
Total	**100%**

Table 6-3 Wellhouse Lane / Flash Lane Distribution

DESTINATION	PROPORTION
Flash Lane (NE)	26%
Slash Lane (SW)	18%
Total	**44%**

Table 6-4 Dunbottle Lane / Flash Lane Distribution

DESTINATION	PROPORTION
Dunbottle Lane (N)	5%
Dunbottle Lane (S)	13%
Total	**18%**

Table 6-5 Greenside Road / Old Bank Road Distribution

DESTINATION	PROPORTION
Sunny Bank Road (NW)	33%
Old Bank Road (SW)	23%
Total	**56%**

6.3.4 The resultant arrival and distribution traffic distribution patterns are shown at **Appendix I**. These proportions have been applied to the total development traffic generation and the resultant development traffic assignment is shown at **Appendix I**.

6.3.5 It is considered that the trips generated and distributed through these junctions are minimal and when taking account of daily fluctuations in traffic flows are unlikely to be noticeable on the local highway network. As such it is not considered that there would be any negative impact on the local highway network as a result of the proposals.

7 SUMMARY

7.1.1 AMA have been commissioned by Bellway Homes to produce this TS in connection with the submission of a full planning application for residential development on a site in Mirfield, Kirklees. The development proposals comprise 61 residential dwellings. The site is located off Wellhouse Lane to the north of Mirfield, approximately 10km to the north east of Huddersfield Town Centre and approximately 6km to the west of Dewsbury Town Centre.

7.1.2 Woodward Court will provide vehicular access into the development via the existing public highway. The public highway currently bounds the site to the east of Woodward Court and to the north western extreme of the site. The access is effectively the proposed extension of Woodward Court. Two metre wide footways will be provided on both sides of the principle spine road which will extend from the existing provision on Woodward Court.

7.1.3 It is considered that Woodward Court is of an appropriate standard to serve the proposed development and that the junction of Woodward Court and Wellhouse Lane is of an appropriate standard to serve the development without resulting in any increased level of risk to highway or pedestrian safety.

7.1.4 The existing visibility splays at the junction of Woodward Court and Wellhouse Lane are considered to be acceptable based on existing 85th percentile speeds and achievable splays. However, in addition the development proposes what are considered to be additional benefits to the wider highway network through the delivery of some traffic calming measures at key pedestrian desire line crossing points in close proximity to the Primary School.

7.1.5 Provision would assist in reducing both average and 85th percentile speeds in the vicinity of the school and the proposed site access, further improving existing highway conditions and a reduction in any vehicle / pedestrian conflicts. There is not considered to be an existing highways safety issue in the local vicinity of the school and the proposed raised tables are to further reduce any existing risk and provide amenity for those accessing the school and further improving the safety of children and parents accessing the school on foot and by cycle.

7.1.6 The proposed calming is therefore concluded to improve existing highways conditions and further reduce any potential highways risks in the vicinity of the school particularly at key crossing locations.

7.1.7 The site is accessible by sustainable modes as there are good opportunities for people to walk, cycle and use public transport to access existing facilities located in Mirfield Town Centre and the surrounding areas.

7.1.8 From a policy context, the site benefits from being within walking distance of bus stops, cycling distance from a train station and being in the vicinity of national cycle routes.

7.1.9 Using data obtained from the TRICs database a forecast has been made of the vehicular trips likely to be generated by the proposed quantum of development. The proposed development is expected to generate circa 36 two way vehicular trips during the local highway network AM peak hour and 33 during the PM peak hour, resulting in approximately one vehicle movement every two minutes during the worst peak and network hours of the day.

7.1.10 It is considered that the trips generated and distributed on local junctions, when taking account of daily fluctuations in traffic flows are unlikely to be noticeable on the local highway network. As such it is not considered that there would be any negative impact on the local highway network as a result of the proposals and that no junction capacity modelling is required.

7.1.11 It is therefore considered that there are no overriding reasons preventing the local highway authority from recognising that the proposals are acceptable with regards to the traffic and transportation elements of the development.

FIGURES

Title:

Site Location Plan
Wellhouse Lane, Mirfield

Figure No:

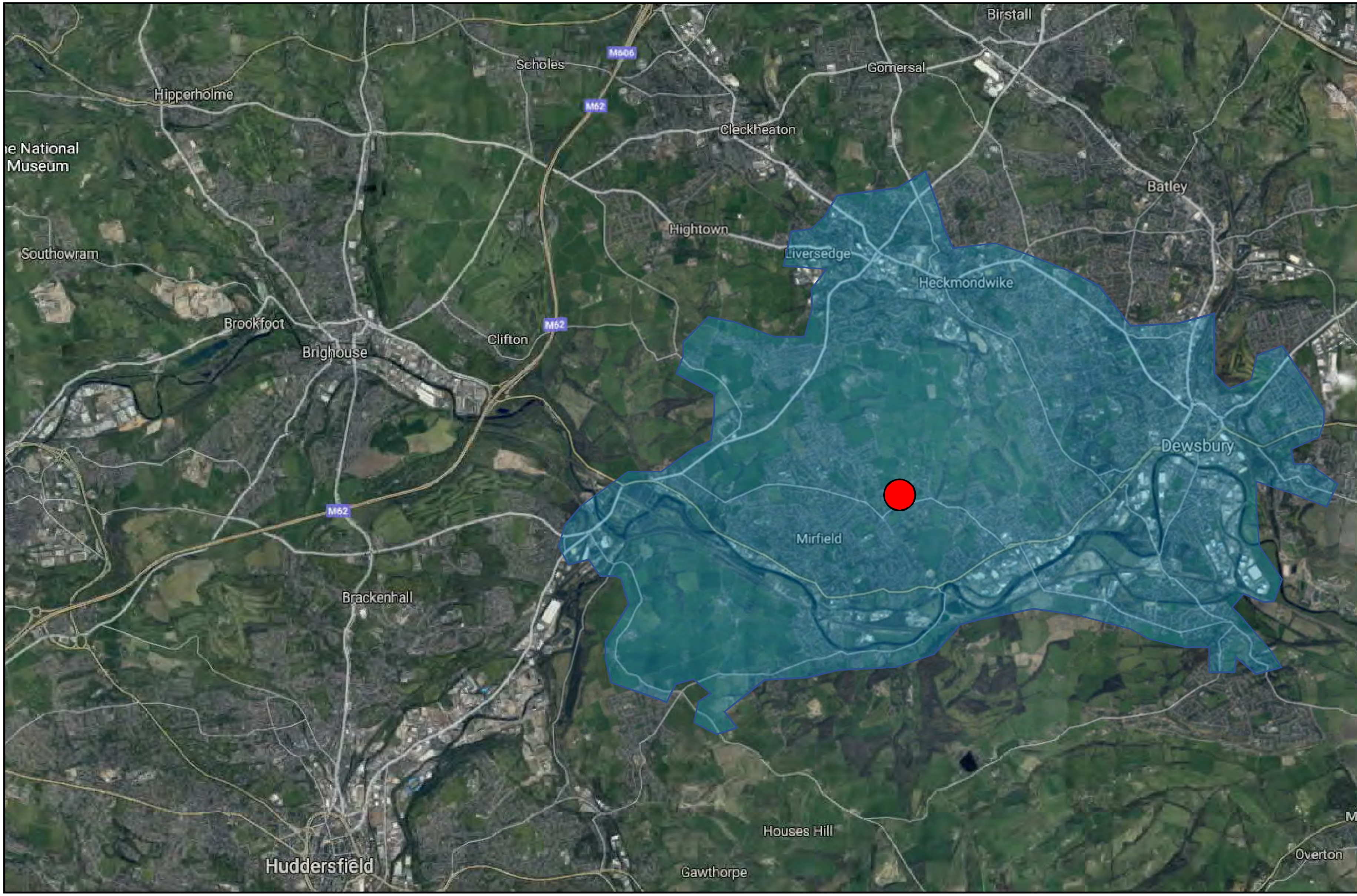
Figure 1

Title:

2km Walking Distance
Wellhouse Lane, Mirfield

Figure No:

Figure 2



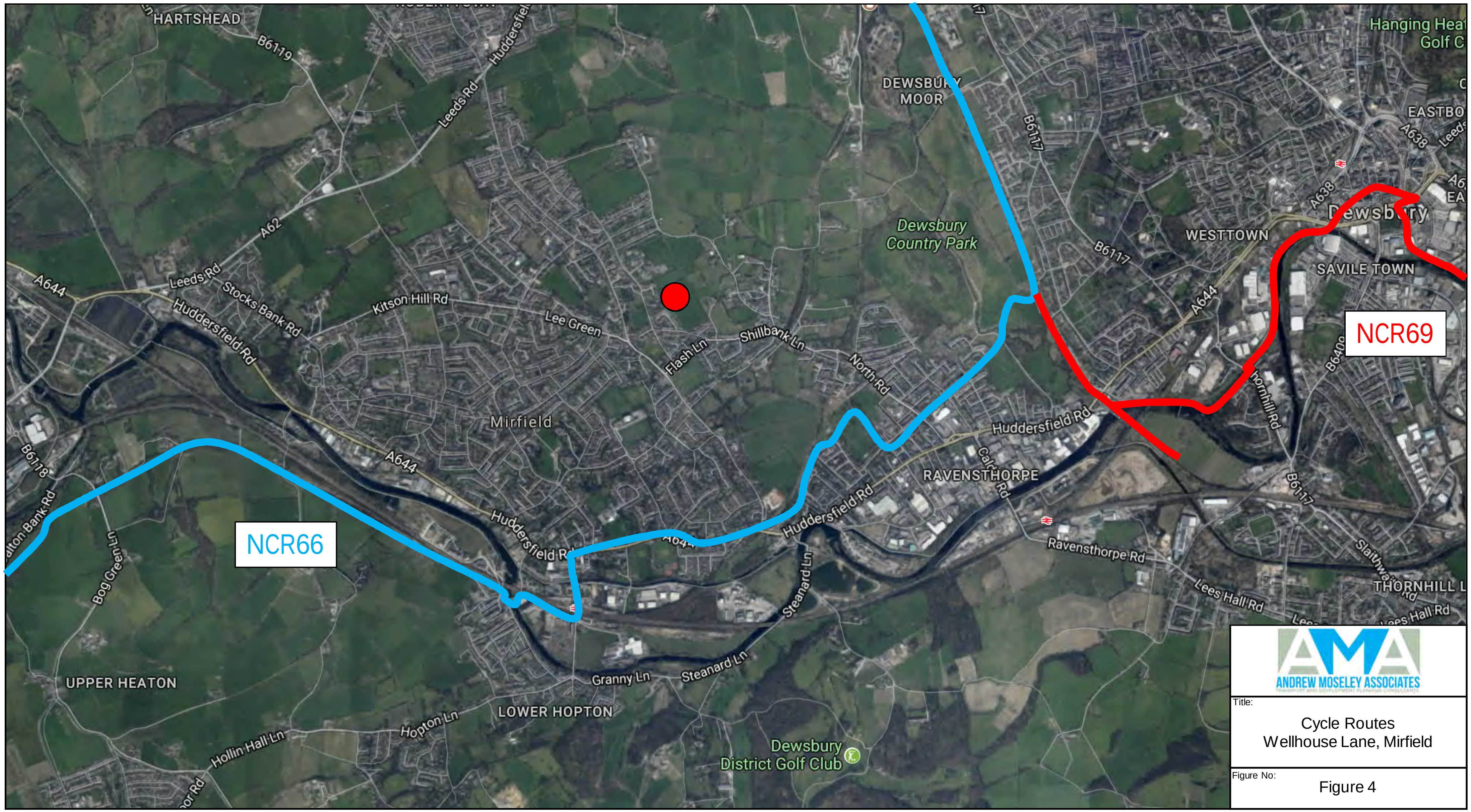
ANDREW MOSELEY ASSOCIATES

Title:

5km Cycling Distance
Wellhouse Lane, Mirfield

Figure No:

Figure 3



Title:

Cycle Routes
Wellhouse Lane, Mirfield

Figure No:

Figure 4

ANDREW MOSELEY ASSOCIATES

TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

Title:

Bus Stop Location Plan
Wellhouse Lane, Mirfield

Figure No:

Figure 5

APPENDICES

Appendix A Indicative Site Layout and Access Proposals

Appendix B Proposed Site Access Junction Visibilities

Appendix C Automatic Traffic Count Data

Appendix D 2011 – 2016 Accident Data Plot

Appendix E Speed Table

Appendix F Traffic Calming Paper 'Road Humps Should Be Dug Up – The Case Against'

Appendix G Traffic Calming Research Extract – 'Civilised Streets: A Guide to Traffic Calming'

Appendix H Trics Output Data

Appendix I Flow Scenarios

Appendix A

INDICATIVE SITE LAYOUT AND ACCESS PROPOSALS

Notes:

PLANNING LAYOUT KEY

- 1.8m MASONARY WALL
- 1.8m TIMBER FENCE
- 0.9m ESTATE RAILING
- BLOCK PAVING
- REMOVED HEDGE SECTION
- RETAINED TREE
- ROOT PROTECTION
- AFFORDABLE
- BIN COLLECTION POINT (BIN COLLECTION DAY ONLY)

Bellway

Reference	Total
Private	
3 BEDS	
Beswick	6
Hawthorne	7
Wickham	6
4 BEDS	
Middleham	5
Rosedale	6
Mulberry	7
Acacia	5
Hambleton	7
Sub-Total	**49**
Affordable	
A2 (2 Bed)	6
A3 (3 Bed)	6
Sub-Total	**12**
Total	**61**

REV:	DESCRIPTION:	BY:	DATE:
A	Layout amended in line with clients comments.	TS	02.11.17

STATUS: FOR COMMENT

STEN ARCHITECTURE

Suite 4, Unit 1,
Benton Office Park,
Bennett Avenue,
Horbury,
Wakefield,
WF4 5RA
Tel: 01924 669424

Web: www.sten-architecture.co.uk
Twitter: @STEN_arch
Facebook: stenarchitectureltd
Linkedin: Sten Architecture

CLIENT: Bellway Homes Limited (Yorkshire)
First Floor, 2150 Century Way
Thorpe Park
Leeds, LS15 8ZB

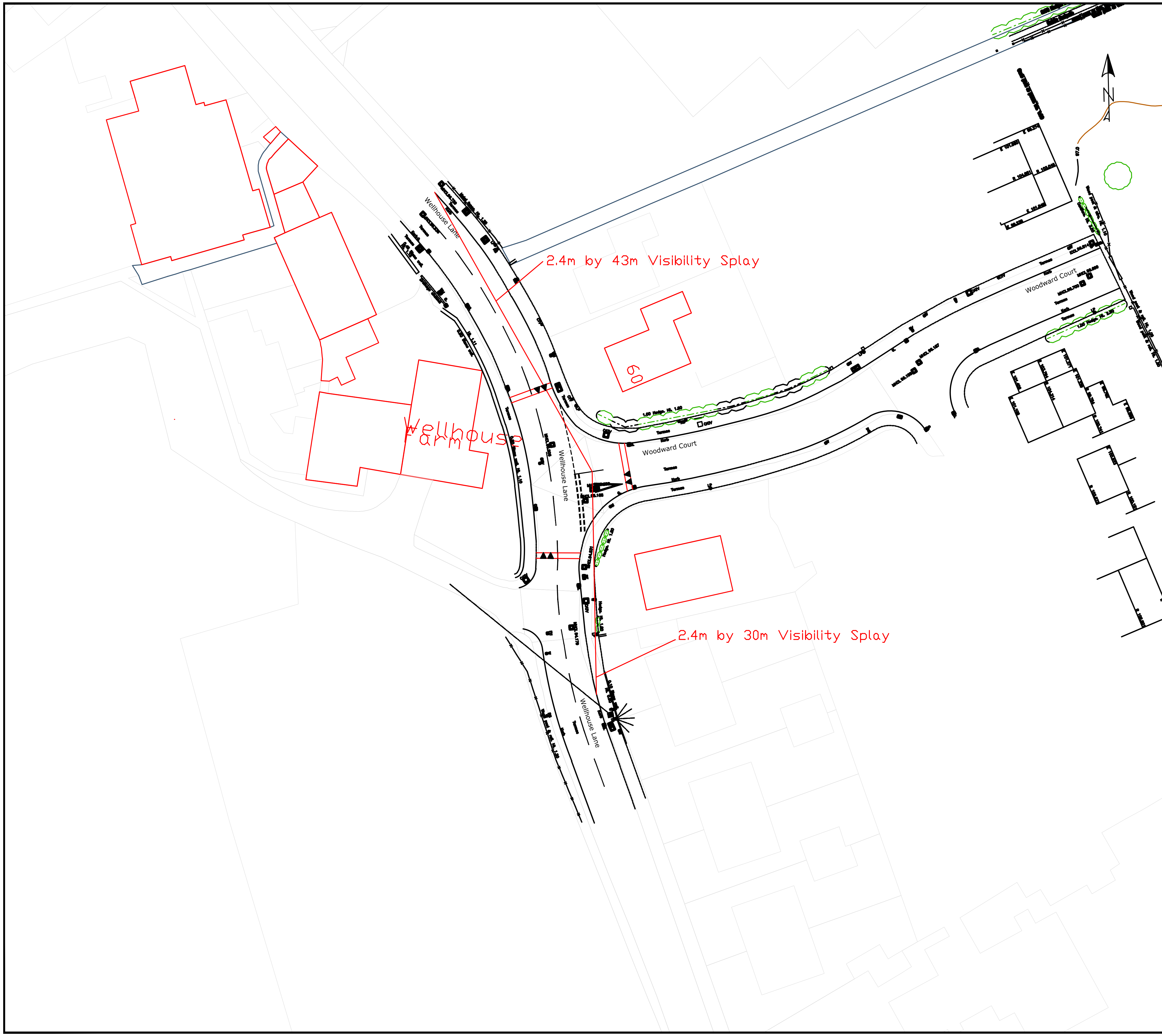
SITE: Mirfield

TITLE: Planning Layout

SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:500	17.07.17	TS	BS
PROJECT NO:	DRAWING NO:		REVISION:
1731	1731.01		A

Appendix B

PROPOSED SITE ACCESS JUNCTION VISIBILITIES



REV	DATE	BY	DESCRIPTION	CHK	APP
-	11.01.2017	SB	FIRST ISSUE	AM	AM

ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

CLIENT:
BELLWAY HOMES YORKSHIRE LTD

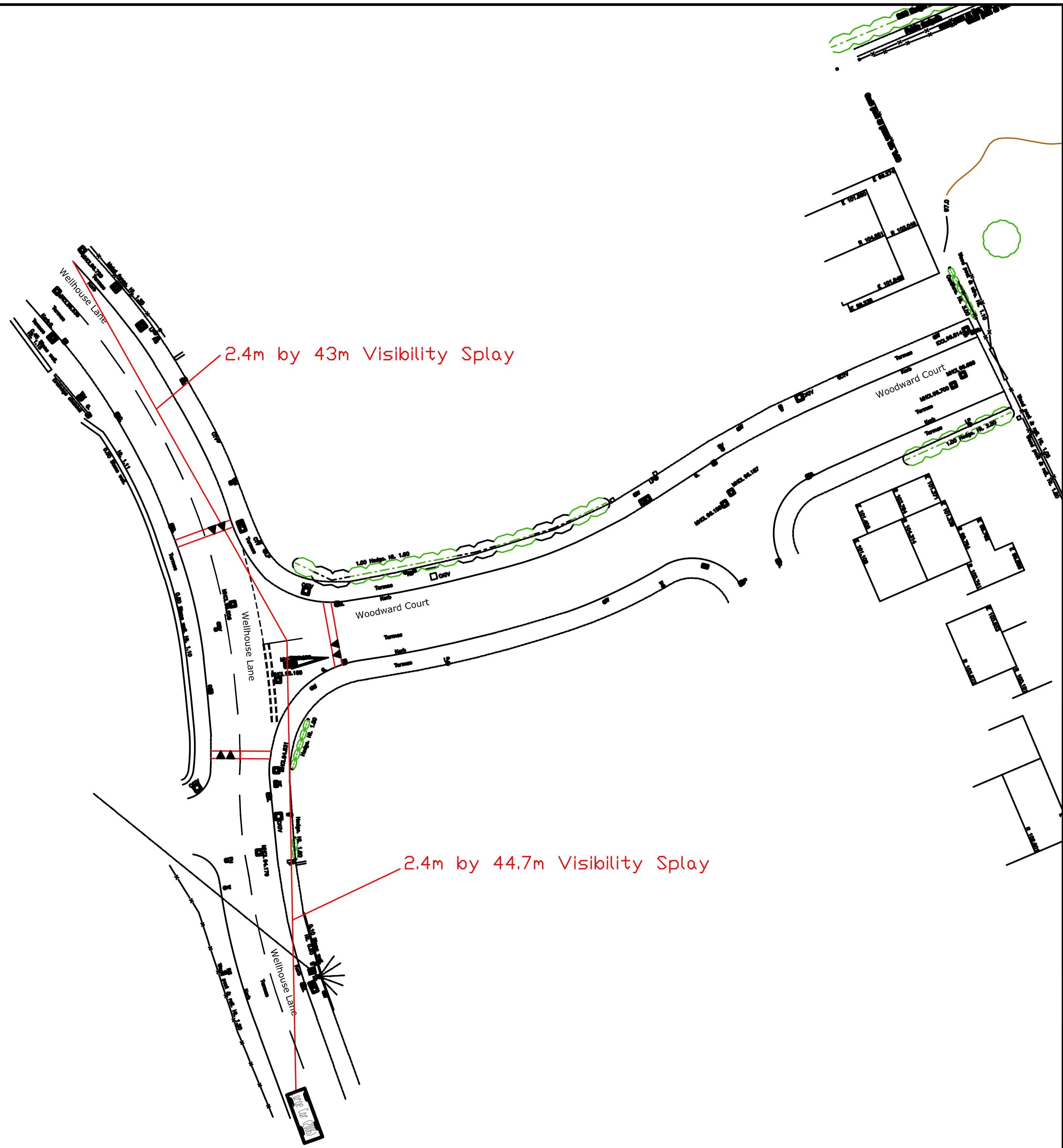
PROJECT:
WELLHOUSE LANE, MIRFIELD

TITLE:
PROPOSED HIGHWAY IMPROVEMENTS OFF
WOODWARD COURT/WELLHOUSE LANE JUNCTION

SCALE @ A3:	CHECKED:		APPROVED:
1:500	AM		AM
PROJECT No:	DESIGNED:	DRAWN:	DATE:
20042	SB	SB	01.11.2017

DRAWING No: PL-20042-001

REV: -



REV	DATE	BY	DESCRIPTION	CHK	APP
-	11.01.2017	SB	FIRST ISSUE	AM	AM

ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

BELLWAY HOMES YORKSHIRE LTD

WELLHOUSE LANE, MIRFIELD

PROPOSED HIGHWAY IMPROVEMENTS OFF WOODWARD COURT/WELLHOUSE LANE JUNCTION

1:500	CHECKED: AM		APPROVED: AM
20042	DESIGNED: SB	DRAWN: SB	DATE: 01.11.2017

PL-20042-002 REV: -

Appendix C

AUTOMATIC TRAFFIC COUNT DATA

Automatic Classified Counts, Mirfield

LOCATION: WELLHOUSE LANE (NORTHERN SITE)

Direction : NORTHBOUND

Wednesday 30/11/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	3	0	0	0	0	0	0	0	0	0	0	0	0	3
6	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7	12	2	0	0	0	0	0	0	0	0	0	0	0	14
8	41	3	0	0	0	0	0	0	0	0	0	1	0	45
9	108	6	0	0	0	0	0	0	0	0	0	0	0	114
10	23	2	0	0	0	0	0	0	0	0	0	0	0	25
11	22	1	0	0	0	0	0	0	0	0	0	0	0	23
12	24	6	0	0	0	0	0	0	0	0	0	0	0	30
13	19	2	0	0	0	0	0	0	0	0	0	0	0	21
14	29	5	0	0	0	0	0	0	0	0	0	0	0	34
15	32	3	0	0	0	0	0	0	0	0	0	0	0	35
16	67	3	0	0	0	0	0	0	0	0	0	0	0	70
17	35	4	0	0	0	0	0	0	0	0	0	0	0	39
18	48	4	0	0	0	0	0	0	0	0	0	0	0	52
19	39	4	0	0	0	0	0	0	0	0	0	0	0	43
20	34	2	0	0	0	0	0	0	0	0	0	0	0	36
21	12	2	0	0	0	0	0	0	0	0	0	0	0	14
22	14	0	0	0	0	0	0	0	0	0	0	0	0	14
23	9	0	0	0	0	0	0	0	0	0	0	0	0	9
24	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7-19	487	43	0	0	0	0	0	0	0	0	0	1	0	531
6-22	559	49	0	0	0	0	0	0	0	0	0	1	0	609
6-24	575	49	0	0	0	0	0	0	0	0	0	1	0	625
0-24	587	49	0	0	0	0	0	0	0	0	0	1	0	637

Direction : SOUTHBOUND

Wednesday 30/11/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6	2	1	0	0	0	0	0	0	0	0	0	0	0	3
7	3	1	0	0	0	0	0	0	0	0	0	0	0	4
8	15	1	0	0	0	0	0	0	0	0	0	0	0	16
9	80	0	0	0	0	0	0	0	0	0	0	0	0	80
10	44	3	0	0	0	0	0	0	0	0	0	0	0	47
11	17	1	0	0	0	0	0	0	0	0	0	0	0	18
12	17	2	1	0	0	0	0	0	0	0	0	0	0	20
13	17	0	0	0	0	0	0	0	0	0	0	0	0	17
14	29	3	0	0	0	0	0	0	0	0	0	0	0	32
15	17	0	0	0	0	0	0	0	0	0	0	0	0	17
16	86	4	0	0	0	0	0	0	0	0	0	0	0	90
17	27	4	0	0	0	0	0	0	0	0	0	0	0	31
18	44	1	0	0	0	0	0	0	0	0	0	0	0	45
19	26	1	0	0	0	0	0	0	0	0	0	0	0	27
20	21	1	0	0	0	0	0	0	0	0	0	0	0	22
21	7	1	0	0	0	0	0	0	0	0	0	0	0	8
22	7	0	0	0	0	0	0	0	0	0	0	0	0	7
23	4	0	0	0	0	0	0	0	0	0	0	0	0	4
24	8	0	0	0	0	0	0	0	0	0	0	0	0	8
7-19	419	20	1	0	0	0	0	0	0	0	0	0	0	440
6-22	457	23	1	0	0	0	0	0	0	0	0	0	0	481
6-24	469	23	1	0	0	0	0	0	0	0	0	0	0	493
0-24	473	26	1	0	0	0	0	0	0	0	0	0	0	500

Please note: This is an A1 sheet to ensure all data is provided. Please zoom into the PDF for detail.

Automatic Classified Counts, Mirfield

LOCATION: WELLHOUSE LANE (SOUTHERN SITE)

Direction : NORTHBOUND

Wednesday 30/11/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	2	0	0	0	0	0	0	0	0	0	0	0	0	2
6	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7	10	2	0	0	0	0	0	0	0	0	0	0	0	12
8	39	4	0	0	0	0	0	0	0	0	0	1	0	44
9	111	9	0	0	0	0	0	0	0	0	0	0	0	120
10	19	2	0	0	0	0	0	0	0	0	0	1	0	22
11	20	1	0	0	0	0	0	0	0	0	0	0	0	21
12	27	7	0	0	0	0	0	0	0	0	0	0	0	34
13	19	2	0	0	0	0	0	0	0	0	0	0	0	21
14	22	8	0	0	0	0	0	0	0	0	0	0	0	30
15	50	3	0	0	0	0	0	0	0	0	0	0	0	53
16	73	3	0	0	0	0	0	0	0	0	0	0	0	76
17	35	4	0	0	0	0	0	0	0	0	0	0	0	39
18	44	7	0	0	0	0	0	0	0	0	0	0	0	51
19	37	6	0	0	0	0	0	0	0	0	0	0	0	43
20	35	2	0	0	0	0	0	0	0	0	0	0	0	37
21	14	2	0	0	0	0	0	0	0	0	0	0	0	16
22	14	0	0	0	0	0	0	0	0	0	0	0	0	14
23	10	0	0	0	0	0	0	0	0	0	0	0	0	10
24	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7-19	496	56	0	0	0	0	0	0	0	0	0	2	0	554
6-22	569	62	0	0	0	0	0	0	0	0	0	2	0	633
6-24	586	62	0	0	0	0	0	0	0	0	0	2	0	650
0-24	596	62	0	0	0	0	0	0	0	0	0	2	0	660

Direction : SOUTHBOUND

Wednesday 30/11/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6	2	1	0	0	0	0	0	0	0	0	0	0	0	3
7	3	1	0	0	0	0	0	0	0	0	0	0	0	4
8	22	0	0	0	0	0	0	0	0	0	0	0	0	22
9	64	1	0	0	0	0	0	0	0	0	0	0	0	65
10	64	2	0	0	0	0	0	0	0	0	0	0	0	66
11	18	0	0	0	0	0	0	0	0	0	0	0	0	18
12	17	0	0	0	0	0	0	0	0	0	0	0	0	17
13	15	0	0	0	0	0	0	0	0	0	0	0	0	15
14	28	4	0	0	0	0	0	0	0	0	0	0	0	32
15	18	0	0	0	0	0	0	0	0	0	0	0	0	18
16	106	5	0	0	0	0	0	0	0	0	0	0	0	111
17	25	1	0	0	0	0	0	0	0	0	0	0	0	26
18	37	1	0	0	0	0	0	0	0	0	0	0	0	38
19	27	1	0	0	0	0	0	0	0	0	0	0	0	28
20	20	0	0	0	0	0	0	0	0	0	0	0	0	20
21	7	1	0	0	0	0	0	0	0	0	0	0	0	8
22	7	0	0	0	0	0	0	0	0	0	0	0	0	7
23	4	0	0	0	0	0	0	0	0	0	0	0	0	4
24	8	0	0	0	0	0	0	0	0	0	0	0	0	8
7-19	441	15	0	0	0	0	0	0	0	0	0	0	0	456
6-22	478	17	0	0	0	0	0	0	0	0	0	0	0	495
6-24	490	17	0	0	0	0	0	0	0	0	0	0	0	507
0-24	494	20	0	0	0	0	0	0	0	0	0	0	0	514

Automatic Classified Counts, Mirfield

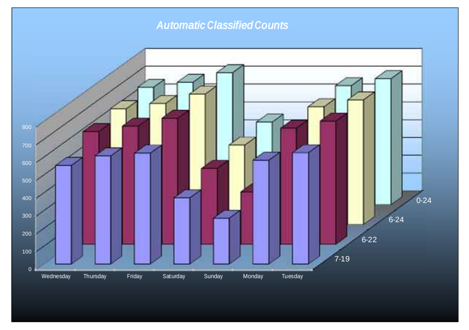
LOCATION: WELLHOUSE LANE (SOUTHERN SITE)

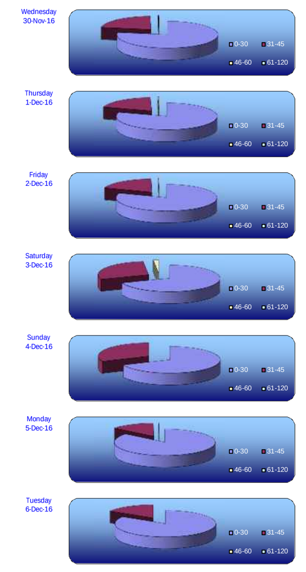
Direction : NORTHBOUND

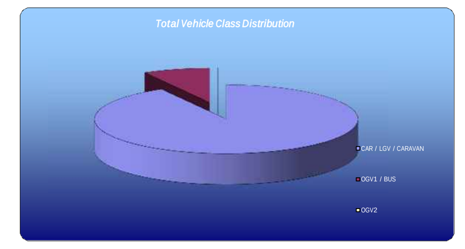
Thursday 01/12/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	0	0	0	0	0	0	0	0	0	0	0	0	3
6	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7	11	0	0	0	0	0	0	0	0	0	0	0	0	11
8	35	5	0	0	0	0	0	0	0	0	0	0	0	40
9	138	7	0	0	0	0	0	0	0	0	0	0	0	145
10	33	1	0	0	0	0	0	0	0	0	0	0	0	34
11	20	3	0	0	0	0	0	0	0	0	0	0	0	23
12	32	5	0	0	0	0	0	0	0	0	0	0	0	37
13	23	5	0	0	0	0	0	0	0	0	0	0	0	28
14	32	2	0	0	0	0	0	0	0	0	0	0	0	34
15	61	5	0	0	0	0	0	0	0	0	0	0	0	66
16	72	4	0	0	0	0	0	0	0	0	0	0	0	76
17	43	6	0	0	0	0	0	0	0	0	0	0	0	49
18	43	5	0	0	0	0	0	0	0	0	0	0	0	48
19	25	3	0	0	0	0	0	0	0	0	0	0	0	28
20	19	0	0	0	0	0	0	0	0	0	0	0	0	19
21	18	0	0	0	0	0	0	0	0	0	0	0	0	18
22	8	0	0	0	0	0	0	0	0	0	0	0	0	8
23	11	1	0	0	0	0	0	0	0	0	0	0	0	12
24	3	1	0	0	0	0	0	0	0	0	0	0	0	4
7-19	557	51	0	0	0	0	0	0	0	0	0	0	0	608
6-22	613	51	0	0	0	0	0	0	0	0	0	0	0	664
6-24	627	53	0	0	0	0	0	0	0	0	0	0	0	680
0-24	635	53	0	0	0	0	0	0	0	0	0	0	0	688

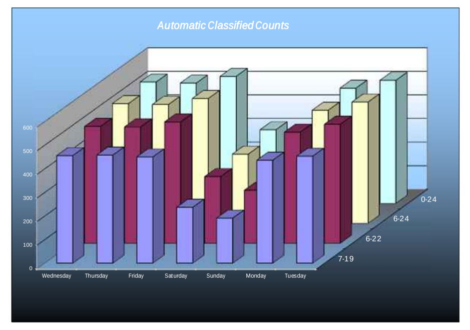
Direction : SOUTHBOUND

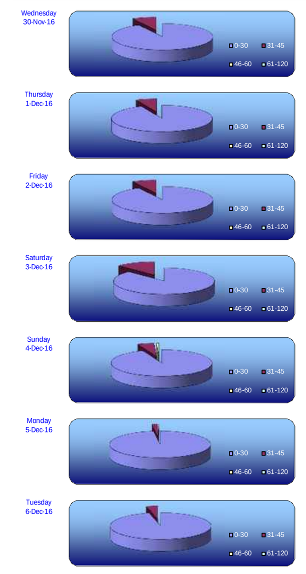
Thursday 01/12/2016	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	0	0	0	0	0	0	0	0	0	0	0	0	2
6	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7	6	0	0	0	0	0	0	0	0	0	0	0	0	6
8	15	1	0	0	0	0	0	0	0	0	0	0	0	16
9	64	1	0	0	0	0	0	0	0	0	0	0	0	65
10	60	3	0	0	0	0	0	0	0	0	0	0	0	63
11	20	0	0	0	0	0	0	0	0	0	0	0	0	20
12	25	2	0	0	0	0	0	0	0	0	0	0	0	27
13	21	0	0	0	0	0	0	0	0	0	0	0	0	21
14	23	3	0	0	0	0	0	0	0	0	0	0	0	26
15	29	4	0	0	0	0	0	0	0	0	0	0	0	33
16	78	3	0	0	0	0	0	0	0	0	0	0	0	81
17	36	1	0	0	0	0	0	0	0	0	0	1	0	38
18	34	1	0	0	0	0	0	0	0	0	0	0	0	35
19	32	1	0	0	0	0	0	0	0	0	0	0	0	33
20	13	0	0	0	0	0	0	0	0	0	0	0	0	13
21	10	0	0	0	0	0	0	0	0	0	0	0	0	10
22	6	0	0	0	0	0	0	0	0	0	0	0	0	6
23	8	0	0	0	0	0	0	0	0	0	0	0	0	8
24	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7-19	437	20	0	0	0	0	0	0	0	0	0	1	0	458
6-22	472	20	0	0	0	0	0	0	0	0	0	1	0	493
6-24	482	20	0	0	0	0	0	0	0	0	0	1	0	503
0-24	488	20	0	0	0	0	0	0	0	0	0	1	0	509

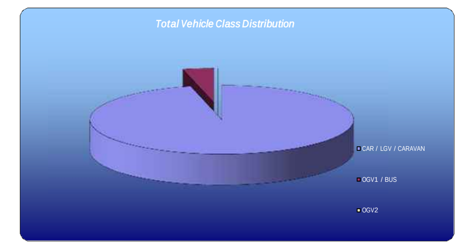












Please note: This is an A1 sheet to ensure all data is provided. Please zoom into the PDF for detail.

Appendix D

2011 – 2016 ACCIDENT DATA PLOT

Key

Slight Accident

TITLE:

Woodward Court Residential Development

FIGURE No:

Accident Plot 2011 - 2015

File: Created using iGIS, WSP's Online Mapping System

Drawn By: UKAXM075

Date Modified: 10/05/2017 21:23

Appendix E

SPEED TABLE

REV	DATE	BY	DESCRIPTION	CHK	APP
-	11.01.2017	SB	FIRST ISSUE	AM	AM

ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

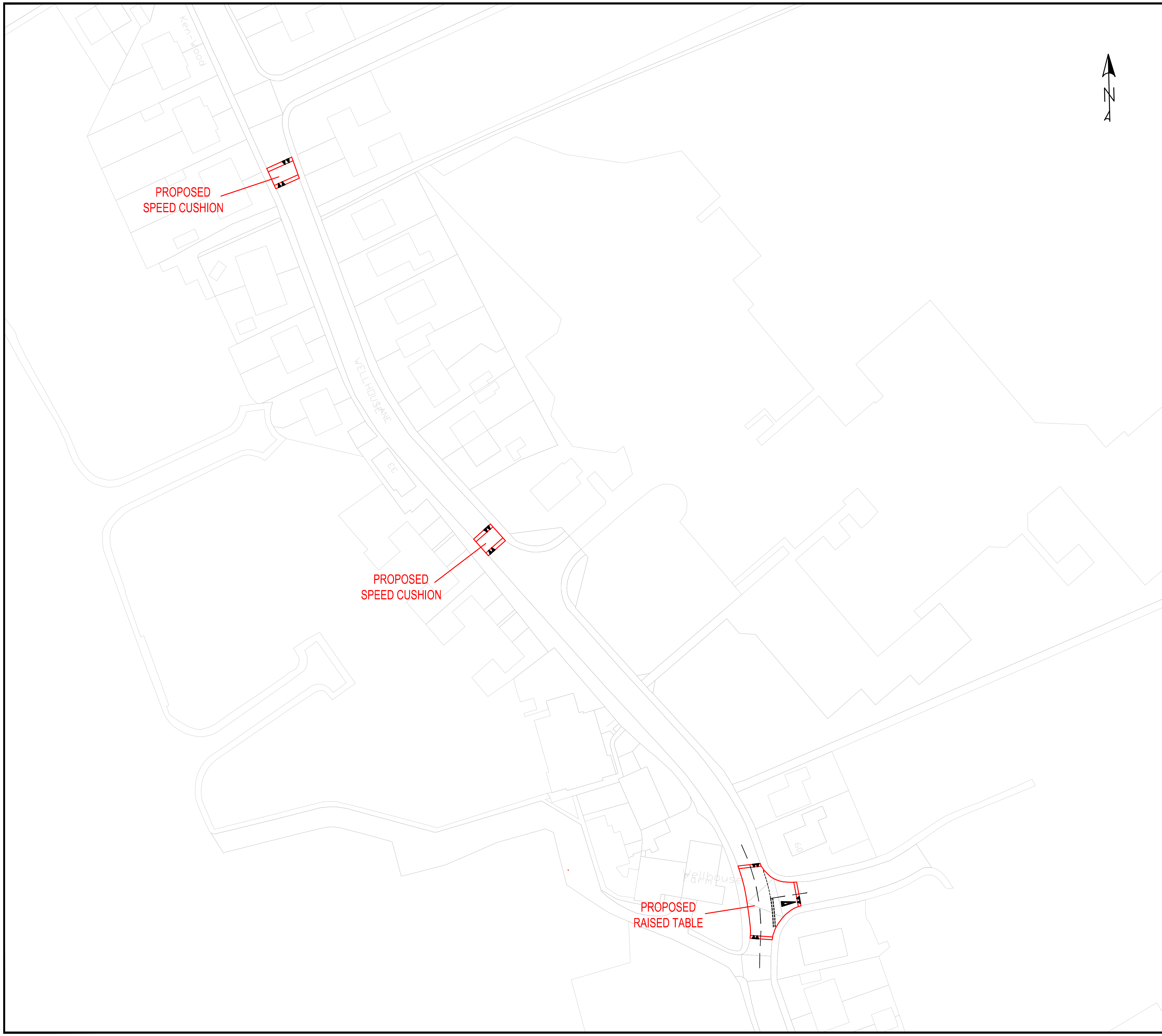
CLIENT:
BELLWAY HOMES YORKSHIRE LTD

PROJECT:
WELLHOUSE LANE, MIRFIELD

TITLE:
PROPOSED SPEED TABLE

SCALE @ A3:	CHECKED:		APPROVED:
1:500	AM		AM
PROJECT No:	DESIGNED:	DRAWN:	DATE:
20042	SB	SB	01.11.2017

DRAWING No: PL-20042-003
REV: -



Notes.

1. All costs associated with lining and signing of the proposed speed management measures are to be borne by the developer in line with an agreed scheme at detailed design stage with Kirklees Highways Officers.

REV	DATE	BY	DESCRIPTION	CHK	APP
-	11.01.2017	SB	FIRST ISSUE	AM	AM

ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

CLIENT:
BELLWAY HOMES YORKSHIRE LTD

PROJECT:
WELLHOUSE LANE, MIRFIELD

TITLE:
PROPOSED HIGHWAY IMPROVEMENTS OFF WOODWARD COURT/WELLHOUSE LANE JUNCTION

SCALE @ A3: 1:500	CHECKED: AM	APPROVED: AM
PROJECT No: 20042	DESIGNED: SB / DRAWN: SB	DATE: 01.11.2017

DRAWING No: PL-20042-004
REV: -

Appendix F

TRAFFIC CALMING PAPER ‘ROAD HUMPS SHOULD BE DUG UP – THE CASE AGAINST’

Road Humps should be dug up: The Case Against – by Rob Gifford of PACTS.

Research into the effectiveness of engineering solutions to reduce vehicle speeds began in the 1970s at the Transport Research Laboratory. Initial research comprised a comprehensive track trial of different hump heights and lengths (in the direction of travel) undertaken by Watts (Watts, 1973). Numerous designs of hump varying from 50mm long by 12mm high to 3.6 metres long by 150mm high were tested. Various types of vehicle, including goods vehicles, a moped and a bus, were driven over the humps at a range of speeds. Both comfort levels of vehicle occupants and peak vertical accelerations were also assessed.

As a result of this research, the initial "standard" design hump was developed. This comprised a circular profile hump, 3.6 meters long by 100mm high. This type of hump was installed in 9 trial sites that were subsequently evaluated (Baguley, 1981).

The history of road humps can be traced through the Regulations governing their dimensions and positioning. Their usage as a speed reduction measure was permitted through an amendment to the Highways Act 1980 contained in the Transport Act 1981. Schedule 10 of the Act allows both highway authorities and the Secretary of State to construct road humps at the public expense and enables the Secretary of State to do the following

> "The Secretary of State may by regulations make such provision in relation to the construction and maintenance of road humps as appears to him to be necessary or expedient in the interests of safety and the free movement of traffic".

A number of sets of Regulations have been made by subsequent Secretaries of State that have created a more flexible approach to the dimensions of humps. The 1990 Regulations, for example, enabled local authorities to install flat-top as well as round-top humps. The current Highways (Road Hump) Regulations 1999 are perhaps the most permissive, allowing local authorities to install humps (including speed cushions) on roads with a speed limit of 30mph or less without the need for special authorisation, providing the humps are between 25 and 100 mm in height, at least 900 mm long and no vertical face is greater than 6 mm. What is important to recognise at all times is that the effectiveness (or otherwise) of road humps is built on the relationship between the height, length and distance between humps.

What may also be useful to note from the outset is the variety of humps that are currently available. The history of the round-top (circular profile) hump has been outlined above. However, this is not the only design in use. *Sinusoidal* humps are of similar dimensions but have a shallower initial rise and are considered to provide a more comfortable ride for cyclists. *Flat-top* humps provide flat crossing places and can be used with zebra or signal controlled pedestrian crossings with tactile paving. If these are used, it is important to consider the gradient of the ramp as this can affect driver or passenger discomfort, with shallower gradients reducing discomfort and allowing higher speeds. In addition, most bus companies prefer longer plateau lengths.

Raised junctions are a form of flat-top hump covering an entire junction. These can also be constructed to 100 mm high to bring them close to the level of adjacent footways thereby benefiting the visually impaired. *"H" and "S"* humps attempt to provide a measure acceptable to both cars and buses. The *"H"* hump has two longer shallower outer profiles to take the tyres of buses and shorter inner steeper profiles to take cars. Finally, *speed cushions* offer an alternative to the full-size road hump, occupying part of the traffic lane and being more easily straddled by large vehicles with wide track widths such as buses and emergency vehicles.

Research into the effectiveness of different types of traffic calming measures is substantial. One of the most significant is Webster and Mackie (1996). This looked at the effect of traffic calming using 20mph zones, of which, at the time of writing, there were 200 schemes installed in the UK. The establishment of 20mph zones was encouraged by the Department of Transport as one measure towards achieving the target for road casualty reduction set for the year 2000. Funding was available at the time from the Department through the Transport Supplementary Grant when zones were being introduced to tackle a casualty problem within a specific locality. It is important to note that at that time authorisation for 20mph zones was required from the Department of Transport. The power to implement such zones has now been passed to local authorities through the Transport Act 2000.

The conclusions from the research were that

1) Average annual accident frequency had fallen by about 60%

2) Child pedestrian and child cyclist accidents fell by 70 and 48 per cent respectively;
3) Speed data showed that average speed 'at a calming measure' was 13.2mph and 'between calming measures' was 17.8mph, with overall vehicle speeds falling by, on average, 9.3mph;
4) There was a 6.2% reduction in accidents for each 1mph reduction in vehicle speed;
5) Traffic flows were reduced on average by 27% in the zones and there were increases on surrounding roads of approximately 12%;
6) Accident migration was not found to be a problem although care should be taken to avoid traffic transferring to unsuitable routes; and
7) Overall reactions from residents were generally in favour of the schemes.

Within the zones, a wide variety of measures had been used to enforce the 20mph limit. This is important to remember in any discussion about "humps". As shown above, they come in many guises. In this study, 52% of measures were round-top humps and 30% flat-top humps which were mainly 75 or 100mm high. Raised junctions accounted for 10% and speed cushions for 4% with the remainder of measures including mini-roundabouts, chicanes and rumble strips. One key conclusion is that it is essential for a local authority to think carefully about what measures will be most appropriate in which circumstances.

Mackie (1998) also looked at the effectiveness of different urban speed management methods. The background to this study were the twin pressures on local authorities of increased demand for 20mph zones to improve safety on residential roads and the cost of implementing such schemes more widely. Mackie, therefore, looked at different means to reduce speeds including traffic calming and the use of static signs.

The key conclusion was that of all measures available, speed humps are the most effective in reducing both mean and 85th percentile speeds. The ranking of effectiveness was as follows:

1) 20mph zones using speed humps have achieved speed reductions of around 10mph with mean speeds after installation of less than 20mph;
2) Speed cameras have reduced speeds by about 5mph on average but the effect has been very localised to the installation;
3) Flashing signs (often vehicle-activated) have achieved speed reductions of around 4mph on average;
4) Static signs only have a very small effect;
5) 20mph zones using signs only showed no reduction in injury accidents, apart from in the city of Graz in Austria where there was a 13% reduction in injury accidents although the installation programme was accompanied by an extensive publicity and enforcement campaign; and
6) Traffic calming remains the best option to achieve speeds of around 20mph although in the long term in-vehicle technology to control speeds automatically may be a further option.

This study is an important one for two reasons. First, it confirms the effectiveness of traffic calming measures, however unpopular in certain quarters they may be. Secondly, it points to the need for local authorities to consider the scale of speed reduction that is being sought and to choose the most appropriate way of achieving that. Speed management is not achieved through the use of a single measure that will be equally effective in every set of circumstances.

It could be argued that the initial focus on road humps was the product of needing to deal with high-risk accident sites. The next phase in traffic management must be to adopt a more strategic approach, similar to that set out in Urban Safety Management Guidelines (DfT, 2003). This report, co-written with TRL and the Institution of Highways and Transportation, urges local authorities to analyse road type by current and desired function and by accident type. It suggests that a three tier approach should be adopted with roads defined as Main Roads, Local Distributors and Access Roads.

Safety objectives will differ somewhat between the road types. Main roads will aim to improve capacity to take vehicles away from local distributors; safer crossing points will be provided for pedestrians and cyclists; junctions will be improved. Local distributor roads will aim to reduce through traffic, reduce speeds, protect and control parking, and provide safer crossing points and cycle paths. Access roads will be intended for low speed traffic with motor vehicle movements minimised except for residential access. The adoption of a more strategic approach could thus lead to a greater emphasis on road engineering measures to reduce speed on access roads while using engineering solutions to a far lesser extent on main roads.

The implementation of traffic calming schemes as part of speed management policies is primarily the responsibility of the local traffic authority. In carrying out such a policy, the authority will need to take into account any guidance from the Department for Transport contained in Circulars or Traffic Advisory Leaflets.

The advice to local authorities from the Department for Transport contained in Traffic Advisory Leaflet 7/96 is clear: highway authorities need to assess the desired mean "between hump" speed in order to decide what measure to use. The information is contained in the table below.

Appropriate Road Hump Heights for Approximate "Between Hump" Mean Speeds

Road Hump Type	**Mean "Between Hump" Speed (approximately) 30mph**	**Mean "Between Hump" Speed (approximately) 20mph**	**Suggested maximum on/off ramp gradient**
Round Top	50mm - 75mm	75mm	N/A
Flat Top	50mm - 75mm	75mm	1:10
Raised Junction	50mm - 100mm	75mm - 100mm	1:10
Cushion	60mm - 75mm	Without other measures may not be appropriate	1:8
"Thump"	35mm - 45mm. Up to 50mm heights have been used but may cause unnecessary discomfort	Not really appropriate where low speeds are required	N/A

In addition, it is not just the height of the hump that is important but also the spacing between humps. Traffic Advisory Leaflet 2/96 (DoT, 1996) concludes that mean speeds along a road before installation and hump spacings after installation were found to have more effect on mean "after" between-hump speeds than hump type and height (over the height range 75mm to 100mm). The table below shows the estimated spacing requirements.

Estimated Humps Spacings to Achieve Mean "After" Speeds

	Spacing						
	20	40	60	80	100	120	140
Mean "Before" Speeds	**"After" Speeds**						
20	13	14	15	16	18	19	20
25	15	16	17	18	20	21	22
30	17	18	19	20	22	23	24
35	19	20	21	22	24	25	26

The main point to bear in mind is that local authorities have considerable flexibility in the design and placement of road humps. That flexibility is based on a series of field trials, evaluations and research reports. It also reflects the introduction of new ideas and new solutions to local issues. At local level, it is bound to be the case that not all traffic calming measures are the right kind in the right place but there is now a wider range of solutions available.

The Regulations also require local authorities to consult with police, fire and ambulance services as well as organisations or groups representing people who use the road. This last group should include bus operators and residents of streets where humps are to be situated. Rightly, there is a reference to the need to "open up a dialogue with all interested parties to ensure that as far as possible there is consensus in favour of the scheme". However, it should also be noted that consensus often takes a long time to emerge and requires considerable skills on behalf of those undertaking the consultation.

It is also important to note that traffic calming is popular with residents. TRL Report 311 reviewed forty UK and five non-UK surveys of public responses to traffic calming measures. Most of the schemes were on roads with 20 or 30 mph speed limits. Sample sizes in most studies were 50 - 500 respondents, with a maximum of 1000. The overall percentage of respondents who approved of the schemes was 65%. Not surprisingly, this varied according to the types of measures in the schemes: it was 72% for schemes including road humps; 53% for schemes including speed cushions; 59% for schemes including horizontal deflections (Webster, 1998).

None of the above is to argue that there are not legitimate criticisms of the use of road humps to reduce vehicle speeds. Local authorities do need to consider the effects on noise and emissions. Where traffic flow consists predominantly of light vehicles, the installation of road humps should reduce noise levels due to reduced speeds although noise levels may increase where there is a regular flow of commercial vehicles.

Further TRL research (Watts, 1997 and Harris, 1999) also assessed the ground-borne vibration levels generated by a range of vehicles crossing a selection of humps and cushions. This concluded that ground-borne vibration was unlikely to cause any superficial damage to buildings. However, air-borne vibration might be experienced or ground-borne vibration amplified in upper floors of buildings. This issue was considered extensively during the recent Greater London Assembly inquiry into road humps. The inquiry concluded that although there was no evidence or research to show that the presence of humps had led to increases in noise levels or structural damage to properties close to humps, there was a need to set up pilot studies across London to measure noise levels and to take photographs of the interior and exterior of houses before and after the implementation of traffic calming measures.

The other issue that is currently under-researched is the impact of traffic calming measures on vehicles. Early concerns about grounding of long wheelbase vehicles or vehicles with low ground clearance have now been resolved by the use of 75mm high humps with ramp gradients of 1:10 or shallower. Advice on avoiding grounding i8s contained in departmental Advisory Leaflets.

At the same time, there is some anecdotal evidence from bus companies, newspaper reports and emergency services claiming accelerated wear to suspension and tyres because of humps. It has to be said that this is hard to verify beyond individual localities. It would also be difficult to make an assessment of the effect on a private vehicle because the number of humps crossed by any individual vehicle over its lifetime would be very variable. As a result of concerns, DfT has commissioned further research that should be available shortly. This should be used as the basis of advice to local authorities and to individual road users.

Used sensitively and appropriately, road humps provide an effective way to reduce speed of traffic, whether in 20mph zones or on roads with a speed limit of 30mph. Humps have contributed to the fall in deaths and serious injuries among pedestrians and vulnerable road users. In Hull, the use of 20mph zones has led to a fall in injury accidents of approximately 56%, in fatalities of 90% and child casualties of 70%. In York, at those locations where traffic calming measures have been put in place, there has been on average a 52% reduction in crash injuries and a reduction of 11mph in mean speeds.

This is not to argue that every road hump in every place is perfectly placed. Rather, it is to conclude that traffic calming has a part to play in the overall management of speed in urban areas to reduce casualties and improve the quality of life for all road users.

References

Baguley C (1981), *Speed Control Humps - further public road trials*, TRRL Laboratory Report LR 1017, Crowthorne 1981

Department of the Environment, Transport and the Regions (1999), *20mph speed limits and zones*, Traffic Advisory Leaflet 9/99, London 1999

Department for Transport, Local Government and the Regions (2001), *A Road Safety Good Practice Guide*, London 2001

Department for Transport (2003), *Urban Safety Management Guidelines*, London 2003

Department of Transport (1996a), *Road Humps*, Circular Roads 4/96, London 1996

Department of Transport (1996b), *75mm high road humps*, Traffic Advisory Leaflet 2/96, London 1996

Department of Transport (1996c), *Highways (Road Humps) Regulations 1996*, Traffic Advisory Leaflet 7/96, London 1996

Gorell R S J & Tootill W (2001), *Monitoring local authority road safety schemes using MOLASSES*, TRL Report 512, Crowthorne 2001

Harris G J (1999), *Traffic Calming - vehicle generated noise and ground-borne vibration alongside sinusoidal round-top and flat-top road humps*, TRL Report 416, Crowthorne 1999

HMSO (1980), *Highways Act 1980*, London 1980

HMSO (1981), *Transport Act 1981*, London 1981

HMSO (1999), *The Highways (Road Humps) Regulations 1999*, London 1999

Layfield R & Parry D (1998), *Traffic calming - speed cushion schemes*, TRL Report 312, Crowthorne 1998

London Assembly (2004), *London's Got the Hump*, London 2004
Mackie A (1998), *Urban Speed Management Methods*, TRL Report 363, Crowthorne 1998
Watts G R (1973), *Road humps for the control of traffic speeds*, TRRL Report LR 597, Crowthorne 1973
Watts G R (1997), *Traffic Calming - Vehicle generated ground-borne vibration alongside speed control cushions and road humps*, TRL Report 235, Crowthorne 1997
Webster D C (1998), *Traffic Calming - Public Attitude Studies: a literature review*, TRL Report 311, Crowthorne 1998
Webster DC & Layfield R E (1998), *Traffic Calming - Sinusoidal, 'H' and 'S' humps*, TRL Report 377, Crowthorne 1998
Wheeler A H & Taylor M C (1999), *Traffic Calming in Villages on Major Roads: Final Report*, TRL Report 385, Crowthorne 1999

Appendix G

TRAFFIC CALMING RESEARCH EXTRACT – 'CIVILISED STREETS: A GUIDE TO TRAFFIC CALMING'

Table 12. Cost-benefit analysis of traffic calming schemes* using construction cost and accident data, expressed in 1990 prices

Scheme ref.	Accident type	Before	After	Estimate of total annual benefit (£'000)	Cap value of benefit (£'000)	Construction cost (£'000)	B/C ratio
Bristol 2	Injury	4 in 3 yrs	None	1.33 x 7.14	118.7	5.35	22.2
Bristol 3	Injury	3 in 3 yrs	None	1 x 7.14	89.3	13.03	6.8
Bristol 4	Injury	1 in 3 yrs	None	0.33 x 7.14	29.5	17.44	1.7
Bristol 5	Injury	2 in 3 yrs	None	0.67 x 7.14	59.8	12.96	4.6
Reading 1	Injury	13 in 3 yrs	None	4.33 x 7.14	386.5	13.5	28.6
Reading 3	Injury	9 in 3 yrs	None	Not calculated			
	Fatal	2 in 3 yrs	None	Not calculated			
	Slight	2 in 2 yrs					
Aylesbury	Injury	8 in 3 yrs	None	2.67 x 7.14	238.3	27.0	8.8
Bletchley 2	Injury	37 in 3 yrs	19 in 44 mth	7.15 x 7.14	638.1	78.2	8.2
M. Keynes	Injury	49 in 3 yrs	2 in 2 yrs	15.33 x 7.14	1365.5	34.88	39.1
Folkestone	Injury	7 in 3 yrs	2 in 2 yrs	1.33 x 7.14	118.7	12.96	9.2
Gillingham 2	Serious	2 in 3 yrs	None	Not calculated			
	Fatal	2 in 3 yrs	None	Not calculated			
	Slight	None	1 in 2 yrs				
Maidstone	Injury	9 in 3 yrs	None	14.1	176.3	198.0	0.9
	Slight	None	3 in 1 yr				
Rochester 1	Injury	6 in 3 yrs	None	2 x 7.14	178.55	18.5	9.6
Sitt'bourne	Injury	10 in 3 yrs	1 in 2 yrs	Not calculated			
	Fatal	2 in 3 yrs	None	Not calculated			
Bradford 1	Injury	18 in 4 yrs	1 in 17 mth	3.79 x 7.14	338.3	20.4	16.6
Bradford 2	Injury	24 in 3 yrs	10 in 31 mth	4.36 x 7.14	389.1	25.1	15.5
Bromley 4	Serious	1 in 3 yrs	None	5.39	67.4	59.4	1.1
	Slight	2 in 3 yrs	4 in 2 yrs				
Bromley 6	Serious	2 in 3 yrs	None	0.67 x 25.9	215.9	40.7	5.3
Bromley 8	Slight	5 in 3 yrs	1 in 3 yrs	1.33 x 2.44	40.6	100.4	0.4
Bromley 10	Fatal	1 in 3 yrs	None	Not calculated			

*More details of these schemes can be found in *Traffic Calming in Britain* (ETP1992)

independently of its size. It will be seen that the benefit/cost ratio exceeded one (i.e. benefit exceeded cost) for 14 out of the 16 schemes. In addition, for the 3 schemes in which fatal accidents had occurred in the 'before' period, the benefit/cost ratio would also clearly have come out very high if it had been calculated.

The calculations carried out by Kent County Council for a small number of their schemes (most of which were also in our sample) independently confirmed this, with very high 'first year rates of return', as measured by the value of accident savings relative to the construction costs of each scheme. (The only exception was a large multi-phase programme still in the course of construction in Maidstone, where only one year's accident evidence following Phase One was available).

The two schemes where the benefit/cost ratio was below one were those in Maidstone and Bromley (Scheme 8) (for details see Appendix: Types of traffic calming and traffic management measures by towns and councils). The former, costing £198,000 (at 1990 prices), was described by our questionnaire return from Kent County Council as being '...phase 1 of a large urban safety scheme which is still under construction (including reconditioning footways and improved parking facilities)'.

For the Bromley Scheme 8, a follow-up call revealed that substantial drainage work related to the 13 road humps had increased the level of construction costs.

Of the other 14 schemes, the benefit/cost ratio ranged from 1.1 to a massive 39:1. We would argue that this shows that in the vast majority of cases, traffic calming is amply justified by accident savings, using cost-benefit calculations,

which, while simplified and approximate, are based on standard COBA principles. If local authorities or other informed parties would like to suggest alternative values for particular accident types, alternative discount rates, or other modifications, it would be simple to recalculate these figures. However, these benefit/cost ratios are so high that the number above and below one would be unlikely to change much.

Accidents and traffic flows on the treated streets. It would be a major research exercise, which we cannot undertake here, to study accident patterns in streets that may have received additional traffic flow as a result of traffic calming measures. It is, however, quite straightforward to compare quantitatively the degree of traffic flow reduction on the treated streets and compare it with the accident reduction.

There is only a limited number of cases for which useable accident and traffic flow data are both available. (They are detailed in Table 13, and partly overlap with the schemes of Table 12, for which both accident and construction cost data were available). For these 14 cases, however, in all but 2 the accident reduction on the treated streets was much greater than the traffic flow reduction. It was clear that the accident savings were generated mainly by the speed reductions brought about by the traffic calming measures rather than by the traffic flow diversion if any. In 8 of the 14 cases the accident record showed 'none since' the traffic calming measures were installed, and in another 4 there had been less

Table 13. Traffic calming schemes with data on accidents before and after the scheme on the treated streets, with % change in traffic flow (accidents are injury accidents per year unless otherwise stated)

Scheme ref	Accidents Before	After	% reduction in traffic flow on treated streets	
Bristol 2	1.33	0	40	
Bristol 3	0.33	0	-38	(increased)
Reading 1	4.33	0	25	
Folkestone	2.33	1	0	(minimal)
Rochester 1	2	0	30	
Sittingbourne	2 fatal &10 injury in 3 years	0.5	0	(no reduction)
Bradford 1	4.5	0.7	40	
Bradford 2	8	3.6	0	(no reduction)
Bromley 4	1 serious & 2 slight in 3 years	2 slight in 1 year	59	
Bromley 5	1 serious & 7 slight in 3 years	0	24	
Bromley 8	5 slight in 3 years	1 slight in 3 years	27	
Reading 2	n.a.	none since	20	(a.m. peak)
Reading 8	n.a.	none since	0	(no reduction)
Islington 1	5	0	18	

than 1 accident per year since the measures were installed with substantially more before.

The traffic flow reductions varied quite widely. In 4 cases there had been no discernible change in traffic flow since the measures were installed. For one scheme (Bristol 3) there had been an adverse change in traffic flow (i.e. an increase) despite the measures, mainly because of pedestrianization in adjacent streets, but there was still a modest accident reduction sufficient to justify the scheme in cost-benefit analysis terms.

For the sample of 30 schemes for which we were given traffic flow changes, the distribution of percentage reduction in traffic flow on the treated streets (at the morning peak if available, average otherwise) had a mean value of 23% with a standard deviation of 22%

Clearly, if the accidents reported had indeed occurred roughly in proportion to traffic flow, we would be expecting accident numbers to fall by similar levels to the traffic flow. In fact, as pointed out already, in the vast majority of cases the accident reductions following treatment were so much sharper that simple traffic flow effects seemed to be playing a rather minor part compared with the impact of speed reduction or other effects such as traffic separation.

This clearly does not properly answer the question of accident migration, but it makes one feel somewhat more confident that rather modest traffic flow changes (many of which are on minor residential roads anyway) are then spread over the neighbouring streets, which serve as alternatives to the treated ones. While detailed data on the accident record of these neighbouring streets would be required, there is no clear and unambiguous relationship between traffic flow and accidents observed, especially when small numbers of vehicles are involved.

Speed reduction. We saw above that there was a strong implication, from our information on this subset of schemes, that it was the speed reduction brought about by traffic calming that was the principal source of the accident reductions, which led to their justification (with isolated exceptions) in cost-benefit analysis terms. It is therefore worth knowing more about the levels of speed reduction achieved.

It has been well publicized that where collisions between motor vehicles and pedestrians are concerned, quite modest reductions in speed can lead not only to fewer accidents but to very worthwhile improvements in the proportion of pedestrians surviving accidents. In the extreme, a reduction of vehicle speed from 40 mph to 20 mph in accidents involving child pedestrians generates an improvement from most of the pedestrians being killed to almost none of them being fatally injured.

The sample of traffic calming schemes for which we had usable speed data numbered 35 in total and are listed in Table 14. They partly overlap with the samples we looked at in other sections. (For example 10 of them have cropped up earlier in the construction cost/accident reduction analysis). It is no doubt preferable to make use of whatever speed data we were given, ignoring the fact that some of it related to the average speed at or near the traffic calming measures, and some of it to 85%ile levels in the measured speed distribution. A number of the respondents provided considerable extra detail on average and maximum speeds at various locations around the schemes, and this detail is included in the individual scheme descriptions.

The straightforward frequency distribution of average or 85%ile speed reductions for the sample of 35 schemes is as follows:

Speed reduction	Number of cases
0–4 mph	4
5–9 mph	9
10–12mph	13
13–15mph	7
≥16 mph	2
Total	35
Mean	10.0 mph
Standard deviation	3.9 mph

It will be seen that the 'typical' speed reduction achieved by traffic calming measures for these 35 schemes is around 10 mph. Not only is the mean about 10 mph, but the modal group in the frequency distribution is the 10–12 mph group.

One's only misgiving about this rather impressive evidence of the effectiveness of traffic calming in achieving speed reductions is whether there might have been an element of 'self-selection' in the schemes for which we were given this information. In other words, local authorities may have thought that the speed reduction information was worth giving only if it was impressive. Of course the same criticism could possibly be levelled at interpretations of the accident saving data. But in practice a number of local authorities (for instance Reading and Bromley) gave full details on every scheme in their areas, so that there did not seem to be any obvious self-selection bias.

There are two schemes that achieved speed reductions of 16 mph or more. These were, in fact, both reductions of 18 mph in the 85%ile speed and were associated with the 1986 Road Humps Regulations and were located in minor residential roads (in the schemes Reading 2 and Batley). Another seven schemes achieved reductions falling into the 13–15 mph range, and all but two of them were road humps built before 1990. In contrast, the four schemes with speed reductions in the 0–4 mph range made use of measures other than road humps, including width reductions and raised junctions, and were all of a more recent vintage, having been installed in 1990 or 1991.

It seems that the development over recent years of more sophisticated and 'gentler' traffic calming techniques (which may be much more acceptable to public transport operators and emergency services) may often involve less dramatic speed reductions. Nevertheless, as we have seen, the large majority of more sophisticated schemes is strongly justified in terms of accident savings despite a somewhat less 'ferocious' degree of speed reduction.

Environmental impact of traffic calming schemes. Our discussion thus far has focused on the impact of traffic calming

Table 14. Traffic calming schemes with data on traffic speeds before and after the scheme on the treated streets, with summary of measures used

Scheme ref.	Speed reduction (mph)		Summary of measures used on treated streets	Year
Bristol 2	13	(average)	road humps	1985
Bristol 5	7	(average)	road humps	1986
Bristol 6	13	(average)	road humps	1989
Reading 1	14	(approx.)	road humps	1989
Quedgeley	9	(85%ile)	speed tables, chicanes etc.	1990
Folkestone	10	(85%ile)	pinch points, speed tables etc.	1989
Maidstone	10	(85%ile)	pinch points, speed tables etc.	1990
Rochester1	11	(85%ile)	pinch points, speed tables etc.	1990
Sittingbourne	10	(85%ile)	pinch points, speed tables etc.	1989
Bradford 1	8	(85%ile)	rumble strips	1982
Bradford 2	11	(85%ile)	rumble strips	1982
Coventry 3	5	(average)	road humps	1989
Gateshead 1	14	(average)	road humps	1988–90
Kingston	9	(85%ile)	road humps, pinch points, 20 mph zone	1989
Beaulieu	4	(85%ile at scheme)	flat top road hump, reduced width	1991
Buriton	1	(85%ile)	single chicane	1991
Gosport	4	(85%ile)	pinch points	1991
Holbury	12	(85%ile)	road humps	1991
Liphook	12	(85%ile)	road humps, 20 mph zone	1991
Denton (Thameside)	4	(average)	raised junctions, pinch points	1990
Reading 2	18	(85%ile)	road humps	1988
Reading 7	8	(85%ile)	speed tables	1990
Reading 8	15	(85%ile)	road humps	1988
Exeter 1	10	(85%ile)	flat topped road humps, reduced width	1988
Abingdon	11	(average)	road humps	1990
Kidlington (Oxford)	5	(average)	road humps	1990
Guildford 2	12	(85%ile, fastest)	road humps	1990
Aberdeen 1	14	(85%ile)	pinch points, speed tables etc.	1990
Uddingston (Glasgow)	7	(approx.)	reduced width	1990
Newport	11	(85%ile)	road humps, central islands	1989–91
Swansea	8	(85%ile)	speed tables	1990
Islington 1	12	(85%ile)	road humps	1989
Westminster 2	10	(approx.)	road humps (new regs)	1990
Bradford 3	13	(average)	road humps, pinch points, etc.	1991
Batley	18	(85%ile)	road humps	1988

Source: ETP 1992.

measures on accidents, traffic flows and speeds. Given that accidents are the most frequently and easily measured indicator of traffic danger this is not surprising, and although traffic speed reductions will partly duplicate accident savings as a source of benefit, it may also provide a proxy of the reduction in non-accident related anxiety and stress.

The cost-benefit analysis of traffic calming schemes using accident reductions as the principal source of benefit led us to conclude that in general the schemes did not in fact need to be justified on environmental grounds, since the justification on accident reduction grounds was so unambiguous.

However, the relevance of environmental questions in relation to traffic calming lies in several directions.

(i) Firstly, are small-scale traffic calming schemes environmentally beneficial at all? It could be suggested that conventional asphalt road humps actually damage the street appearance, and braking and acceleration traffic noise may be more intrusive than that of constant speed but faster traffic.

(ii) Secondly, can area-wide traffic calming be justified purely on accident savings? As our questionnaire returns made clear, in many cases environmental improvements are one of the principal motives

Appendix H

TRICS OUTPUT DATA

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
VEHICLES

<u>Selected regions and areas:</u>

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
	HC	HAMPSHIRE	1 days
	SC	SURREY	1 days
	WS	WEST SUSSEX	1 days
03	SOUTH WEST		
	DC	DORSET	2 days
	DV	DEVON	2 days
	SM	SOMERSET	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	3 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	3 days
	ST	STAFFORDSHIRE	1 days
	WK	WARWICKSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	5 days
	SY	SOUTH YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	3 days
	GM	GREATER MANCHESTER	1 days
	MS	MERSEYSIDE	1 days
09	NORTH		
	CB	CUMBRIA	2 days
	TW	TYNE & WEAR	2 days
10	WALES		
	PS	POWYS	1 days
11	SCOTLAND		
	AG	ANGUS	1 days
	EA	EAST AYRSHIRE	1 days
	FA	FALKIRK	1 days
	HI	HIGHLAND	1 days
	PK	PERTH & KINROSS	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Number of dwellings
Actual Range:	6 to 98 (units:)
Range Selected by User:	5 to 100 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 13/11/15

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	8 days
Tuesday	9 days
Wednesday	10 days
Thursday	10 days
Friday	6 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	43 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	22
Edge of Town	20
Neighbourhood Centre (PPS6 Local Centre)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	38
Village	1
No Sub Category	4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C1	1 days
C3	41 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	5 days
5,001 to 10,000	12 days
10,001 to 15,000	9 days
15,001 to 20,000	7 days
20,001 to 25,000	4 days
25,001 to 50,000	6 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	4 days
25,001 to 50,000	7 days
50,001 to 75,000	3 days
75,001 to 100,000	12 days
100,001 to 125,000	3 days
125,001 to 250,000	6 days
250,001 to 500,000	7 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	14 days
1.1 to 1.5	29 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	3 days
No	40 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	43 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 AG-03-A-01 BUNGALOWS/DET. ANGUS
KEPTIE ROAD

ARBROATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 7
Survey date: TUESDAY 22/05/12 Survey Type: MANUAL

2 CA-03-A-04 DETACHED CAMBRIDGESHIRE

THORPE PARK ROAD
PETERBOROUGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 9
Survey date: TUESDAY 18/10/11 Survey Type: MANUAL

3 CB-03-A-03 SEMI DETACHED CUMBRIA
HAWKSHEAD AVENUE

WORKINGTON
Edge of Town
Residential Zone
Total Number of dwellings: 40
Survey date: THURSDAY 20/11/08 Survey Type: MANUAL

4 CB-03-A-04 SEMI DETACHED CUMBRIA
MOORCLOSE ROAD
SALTERBACK
WORKINGTON
Edge of Town
No Sub Category
Total Number of dwellings: 82
Survey date: FRIDAY 24/04/09 Survey Type: MANUAL

5 CH-03-A-05 DETACHED CHESHIRE
SYDNEY ROAD
SYDNEY
CREWE
Edge of Town
Residential Zone
Total Number of dwellings: 17
Survey date: TUESDAY 14/10/08 Survey Type: MANUAL

6 CH-03-A-08 DETACHED CHESHIRE
WHITCHURCH ROAD
BOUGHTON HEATH
CHESTER
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 11
Survey date: TUESDAY 22/05/12 Survey Type: MANUAL

7 CH-03-A-09 TERRACED HOUSES CHESHIRE
GREYSTOKE ROAD
HURDSFIELD
MACCLESFIELD
Edge of Town
Residential Zone
Total Number of dwellings: 24
Survey date: MONDAY 24/11/14 Survey Type: MANUAL

8 DC-03-A-01 DETACHED DORSET
ISAACS CLOSE

POOLE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 51
Survey date: WEDNESDAY 16/07/08 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

9 DC-03-A-08 BUNGALOWS DORSET
HURSTDENE ROAD
CASTLE LANE WEST
BOURNEMOUTH
Edge of Town
Residential Zone
Total Number of dwellings: 28
Survey date: MONDAY 24/03/14 Survey Type: MANUAL

10 DV-03-A-01 TERRACED HOUSES DEVON
BRONSHILL ROAD

TORQUAY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 37
Survey date: WEDNESDAY 30/09/15 Survey Type: MANUAL

11 DV-03-A-03 TERRACED & SEMI DETACHED DEVON
LOWER BRAND LANE

HONITON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 70
Survey date: MONDAY 28/09/15 Survey Type: MANUAL

12 EA-03-A-01 DETATCHED EAST AYRSHIRE
TALISKER AVENUE

KILMARNOCK
Edge of Town
Residential Zone
Total Number of dwellings: 39
Survey date: THURSDAY 05/06/08 Survey Type: MANUAL

13 ES-03-A-02 PRIVATE HOUSING EAST SUSSEX
SOUTH COAST ROAD

PEACEHAVEN
Edge of Town
Residential Zone
Total Number of dwellings: 37
Survey date: FRIDAY 18/11/11 Survey Type: MANUAL

14 FA-03-A-01 SEMI-DETACHED/TERRACED FALKIRK
MANDELA AVENUE

FALKIRK
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 37
Survey date: THURSDAY 30/05/13 Survey Type: MANUAL

15 GM-03-A-10 DETACHED/SEMI GREATER MANCHESTER
BUTT HILL DRIVE
PRESTWICH
MANCHESTER
Edge of Town
Residential Zone
Total Number of dwellings: 29
Survey date: WEDNESDAY 12/10/11 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

16 HC-03-A-17 HOUSES & FLATS HAMPSHIRE
CANADA WAY

LIPHOOK
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 36
Survey date: THURSDAY 12/11/15 Survey Type: MANUAL

17 HI-03-A-13 HOUSING HIGHLAND
KINGSMILLS ROAD

INVERNESS
Edge of Town
Residential Zone
Total Number of dwellings: 9
Survey date: THURSDAY 21/05/09 Survey Type: MANUAL

18 LN-03-A-03 SEMI DETACHED LINCOLNSHIRE
ROOKERY LANE
BOULTHAM
LINCOLN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 22
Survey date: TUESDAY 18/09/12 Survey Type: MANUAL

19 MS-03-A-03 DETACHED MERSEYSIDE
BEMPTON ROAD
OTTERSPOOL
LIVERPOOL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 15
Survey date: FRIDAY 21/06/13 Survey Type: MANUAL

20 NF-03-A-01 SEMI DET. & BUNGALOWS NORFOLK
YARMOUTH ROAD

CAISTER-ON-SEA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 27
Survey date: TUESDAY 16/10/12 Survey Type: MANUAL

21 NF-03-A-02 HOUSES & FLATS NORFOLK
DEREHAM ROAD

NORWICH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 98
Survey date: MONDAY 22/10/12 Survey Type: MANUAL

22 NF-03-A-03 DETACHED HOUSES NORFOLK
HALING WAY

THETFORD
Edge of Town
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY 16/09/15 Survey Type: MANUAL

23 NY-03-A-07 DETACHED & SEMI DET. NORTH YORKSHIRE
CRAVEN WAY

BOROUGHBRIDGE
Edge of Town
No Sub Category
Total Number of dwellings: 23
Survey date: TUESDAY 18/10/11 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

24 NY-03-A-08 TERRACED HOUSES NORTH YORKSHIRE
NICHOLAS STREET

YORK
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 21
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

25 NY-03-A-09 MIXED HOUSING NORTH YORKSHIRE
GRAMMAR SCHOOL LANE

NORTHALLERTON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 52
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

26 NY-03-A-10 HOUSES AND FLATS NORTH YORKSHIRE
BOROUGHBRIDGE ROAD

RIPON
Edge of Town
No Sub Category
Total Number of dwellings: 71
Survey date: TUESDAY 17/09/13 Survey Type: MANUAL

27 NY-03-A-11 PRIVATE HOUSING NORTH YORKSHIRE
HORSEFAIR

BOROUGHBRIDGE
Edge of Town
Residential Zone
Total Number of dwellings: 23
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

28 PK-03-A-01 DETAC. & BUNGALOWS PERTH & KINROSS
TULLYLUMB TERRACE
GORNHILL
PERTH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 36
Survey date: WEDNESDAY 11/05/11 Survey Type: MANUAL

29 PS-03-A-02 DETACHED/SEMI-DETACHED POWYS
GUNROG ROAD

WELSHPOOL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 28
Survey date: MONDAY 11/05/15 Survey Type: MANUAL

30 SC-03-A-04 DETACHED & TERRACED SURREY
HIGH ROAD

BYFLEET
Edge of Town
Residential Zone
Total Number of dwellings: 71
Survey date: THURSDAY 23/01/14 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

31 SF-03-A-04 DETACHED & BUNGALOWS SUFFOLK
NORMANSTON DRIVE

LOWESTOFT
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 7
Survey date: TUESDAY 23/10/12 Survey Type: MANUAL

32 SF-03-A-05 DETACHED HOUSES SUFFOLK
VALE LANE

BURY ST EDMUNDS
Edge of Town
Residential Zone
Total Number of dwellings: 18
Survey date: WEDNESDAY 09/09/15 Survey Type: MANUAL

33 SH-03-A-03 DETATCHED SHROPSHIRE
SOMERBY DRIVE
BICTON HEATH
SHREWSBURY
Edge of Town
No Sub Category
Total Number of dwellings: 10
Survey date: FRIDAY 26/06/09 Survey Type: MANUAL

34 SH-03-A-05 SEMI-DETACHED/TERRACED SHROPSHIRE
SANDCROFT
SUTTON HILL
TELFORD
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: THURSDAY 24/10/13 Survey Type: MANUAL

35 SH-03-A-06 BUNGALOWS SHROPSHIRE
ELLESMERE ROAD

SHREWSBURY
Edge of Town
Residential Zone
Total Number of dwellings: 16
Survey date: THURSDAY 22/05/14 Survey Type: MANUAL

36 SM-03-A-01 DETACHED & SEMI SOMERSET
WEMBDON ROAD
NORTHFIELD
BRIDGWATER
Edge of Town
Residential Zone
Total Number of dwellings: 33
Survey date: THURSDAY 24/09/15 Survey Type: MANUAL

37 ST-03-A-05 TERRACED & DETACHED STAFFORDSHIRE
WATERMEET GROVE
ETRURIA
STOKE-ON-TRENT
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 14
Survey date: WEDNESDAY 26/11/08 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

38 SY-03-A-01 SEMI DETACHED HOUSES SOUTH YORKSHIRE
A19 BENTLEY ROAD
BENTLEY RISE
DONCASTER
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 54
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

39 TW-03-A-02 SEMI-DETACHED TYNE & WEAR
WEST PARK ROAD

GATESHEAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 16
Survey date: MONDAY 07/10/13 Survey Type: MANUAL

40 TW-03-A-03 MIXED HOUSES TYNE & WEAR
STATION ROAD
BACKWORTH
NEAR NEWCASTLE
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of dwellings: 33
Survey date: FRIDAY 13/11/15 Survey Type: MANUAL

41 WK-03-A-01 TERRACED/SEMI/DET. WARWICKSHIRE
ARLINGTON AVENUE

LEAMINGTON SPA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 6
Survey date: FRIDAY 21/10/11 Survey Type: MANUAL

42 WK-03-A-02 BUNGALOWS WARWICKSHIRE
NARBERTH WAY
POTTERS GREEN
COVENTRY
Edge of Town
Residential Zone
Total Number of dwellings: 17
Survey date: THURSDAY 17/10/13 Survey Type: MANUAL

43 WS-03-A-05 TERRACED & FLATS WEST SUSSEX
UPPER SHOREHAM ROAD

SHOREHAM BY SEA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 48
Survey date: WEDNESDAY 18/04/12 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	43	32	0.084	43	32	0.290	43	32	0.374
08:00 - 09:00	43	32	0.167	**43**	**32**	**0.401**	**43**	**32**	**0.568**
09:00 - 10:00	43	32	0.145	43	32	0.185	43	32	0.330
10:00 - 11:00	43	32	0.142	43	32	0.143	43	32	0.285
11:00 - 12:00	43	32	0.154	43	32	0.167	43	32	0.321
12:00 - 13:00	43	32	0.165	43	32	0.154	43	32	0.319
13:00 - 14:00	43	32	0.170	43	32	0.177	43	32	0.347
14:00 - 15:00	43	32	0.171	43	32	0.187	43	32	0.358
15:00 - 16:00	43	32	0.246	43	32	0.178	43	32	0.424
16:00 - 17:00	43	32	0.303	43	32	0.185	43	32	0.488
17:00 - 18:00	**43**	**32**	**0.361**	43	32	0.176	43	32	0.537
18:00 - 19:00	43	32	0.237	43	32	0.151	43	32	0.388
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.345			2.394			4.739

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

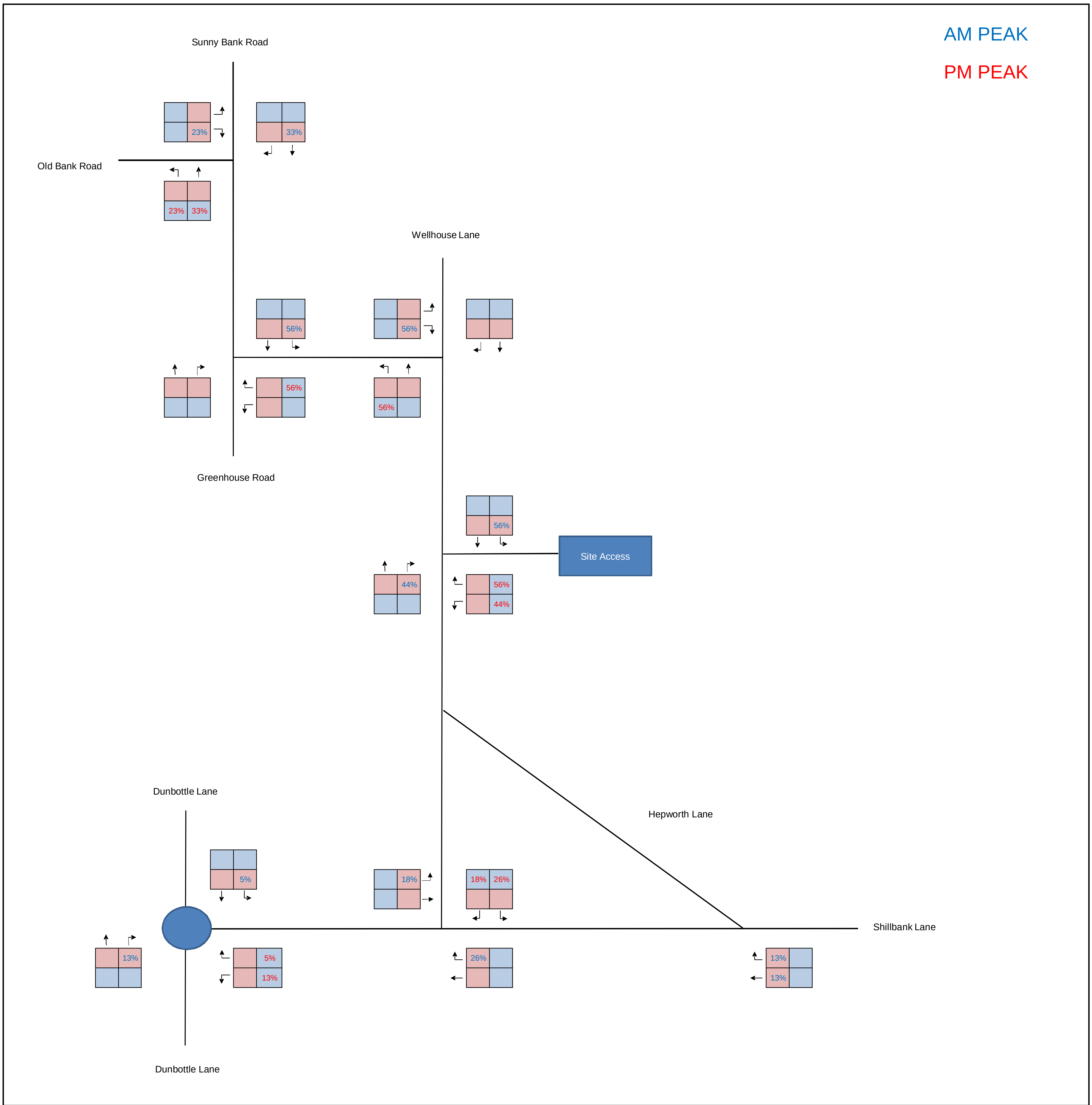
Parameter summary

Trip rate parameter range selected:	6 - 98 (units:)
Survey date date range:	01/01/08 - 13/11/15
Number of weekdays (Monday-Friday):	43
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

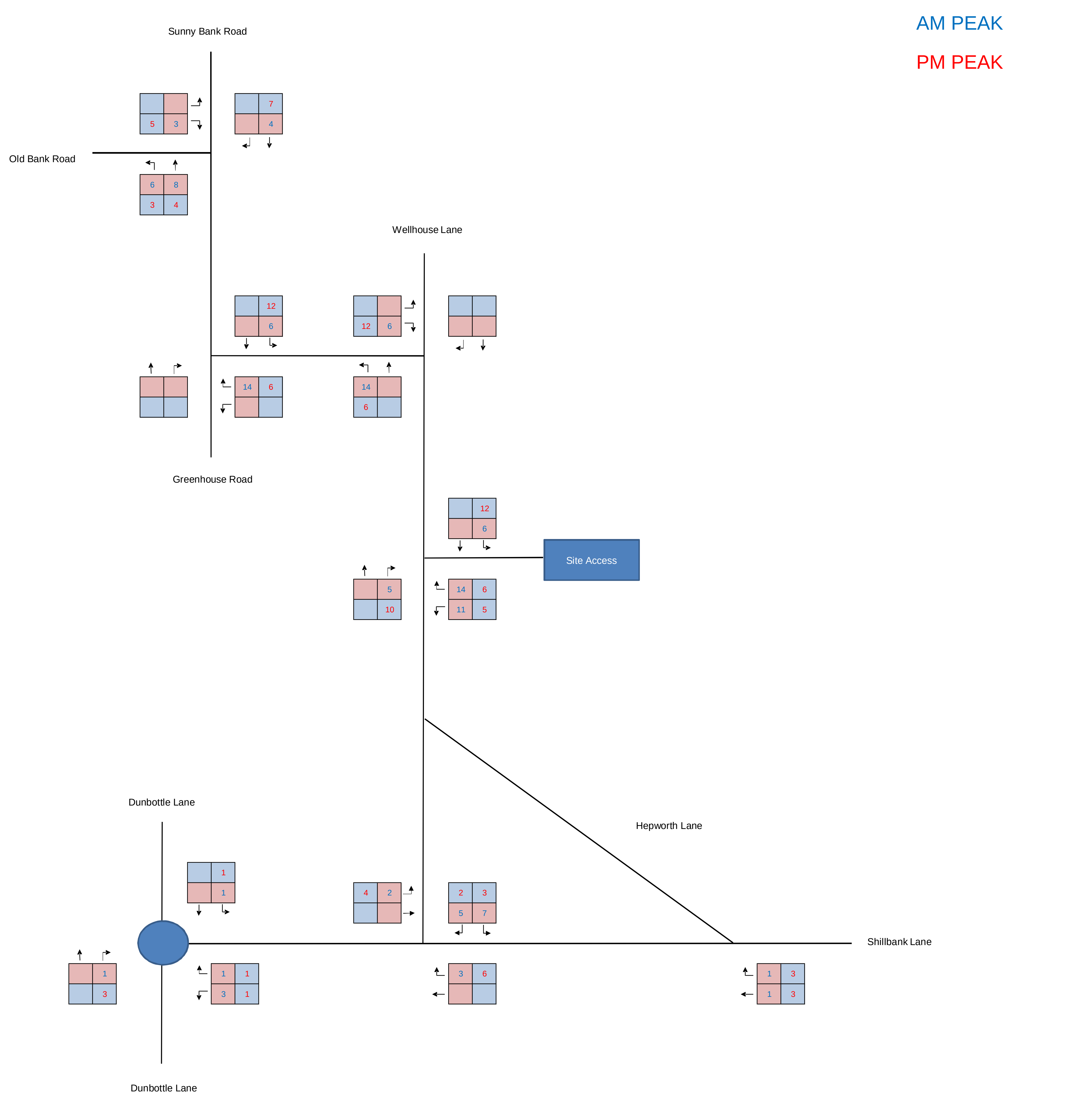
Appendix I

FLOW SCENARIOS



ANDREW MOSELEY ASSOCIATES

Traffic Distribution - Based Upon MSOA Data for Kirklees 020



ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

Proposed Development - Traffic Generation

ANDREW MOSELEY ASSOCIATES
TRANSPORT AND DEVELOPMENT PLANNING CONSULTANTS

Andrew Moseley Associates, No1 Aire Street, Leeds, LS1 4PR

www.amatp.co.uk

info@amatp.co.uk