From: Caroline Reeve [mailto:carolinereeve@rcaregeneration.co.uk]
Sent: 12 October 2018 13:17
To: Brace, Carl; Tookey-Williams, Jill
Cc: Dave Neale; Jon Hickton; Withers, Simon
Subject: 181908 - Land at Lovers Walk, Gorsley
Importance: High

Dear Carl and Jill

Please see attached the completed Stage 1 RSA and DTA's response to the recommendations coming out of the Audit based upon the latest highway drawings submitted for consideration on 21st September 2018. If you could consider this alongside these drawings that would be appreciated. It should be noted that the RSA does question the need for the pedestrian crossing due to the minor nature of the development.

If we could try and resolve highway matters now in relation to the scheme that would be helpful. If you think a meeting with our highway consultant would be the quickest way of reaching agreement rather than playing email ping pong then please let me know.

Kind Regards

Caroline Reeve MRTPI, PG DIP

Associate

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M: 07538 435058

carolinereeve@rcaregeneration.co.uk

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Think ENVIRONMENT: only print if needed!

Forty's Pitch

Gorsley

Road Safety Audit Response Report

david tucker associates
transport planning consultants

1.0 Introduction

1.1 This report sets out the design team response to problems raised in the Stage 1 Road Safety Audit carried out by Road Safety Consulting Ltd on behalf of DTA (reference RSC/KS/EB/18001, 5th October 2018). The audit formally considered the proposed access arrangements. The audit is attached as **Appendix A**.

2.0 Road Safety Audit

2.1 This audit raises four problems, which are set out below along with the response to how these matters will be addressed. It also highlighted two observations that will also be addressed.

2.2 **Location: At the signalled pedestrian crossing**

Summary: Pedestrian to vehicle collisions

Off-peak vehicle speeds are shown to be in excess of the posted 40mph speed limit. Drivers attempting to stop at the signals may overshoot the stop line, particularly in wet weather conditions. This may lead to failure to stop type pedestrian to vehicle collisions.

RECOMMENDATION

It is recommended that the signals installation be provided with appropriate speed assessment / discrimination equipment (or MOVA installation) (reference Table 2 LTN 2-95). Appropriately specified skid resistant surfacing should be provided to ensure braking vehicles.

DESIGN TEAM RESPONSE

The recommendation is generally accepted however, precise details will be discussed agreed with the LHA during the delivery of the crossing.

2.3 **Location: On Forty's Pitch**

Summary: Pedestrian to vehicle collisions

Two bus stops are proposed, to the east of the proposed development access. Pedestrians are unlikely to use the signalled crossing, away from the direct pedestrian desire line, to access these stops. Pedestrians may be vulnerable to being struck by vehicles as they attempt to cross on the likely desire line.

RECOMMENDATION

It is recommended that the bus stops are relocated to maximise the use of the proposed crossing.

DESIGN TEAM RESPONSE

The bus stops are located at a point equidistant between the existing stops on the B4221, which has been agreed in principle with the operator. The crossing has been located on the crest of the hill to maximise the visibility for approaching drivers, it is therefore, not recommended that the crossing be relocated.

A simple dropped kerb crossing could also be provided to assist with crossing the road. See response to 2.6 below for appropriateness of a simple crossing.

2.4 **Location: On Forty's Pitch**

Summary: Vehicle to vehicle collisions

Two bus stops are proposed, to the east of the proposed development access. The orientation of the bus stops may lead to the carriageway being blocked, should buses occupy opposing stops at the same time; this may lead to late braking nose to tail collisions.

RECOMMENDATION

It is recommended that the bus stops are relocated to maximise the use of the proposed crossing – tail to tail configurations are considered conventional, with a separation of three bus lengths.

DESIGN TEAM RESPONSE

The southbound bus stop has been relocated to change the stagger with an approximate separation distance of 35m. This is shown on ***Drawing 16251-11b****.*

2.5 **Location: At the development access**

Summary: Pedestrian injury

At the development access, no dropped kerb crossing facilities are indicated for pedestrians. Some users may have difficulty negotiating full height kerbs and this may result in pedestrian trips or falls.

RECOMMENDATION

It is recommended that appropriate dropped kerb crossing facilities are provided, with tactile paving to highlight the presence of flush kerbing.

DESIGN TEAM RESPONSE

Drawing 16251-11b *shows tactile dropped kerb crossing facilities across the site access junction.*

2.6 **Location: At the signalised crossing (OBSERVATION)**

The proposed development consists of only nine residential properties; this level of development is unlikely to generate substantial levels of pedestrian activity and with low levels of existing development there may be a low frequency of operation of the crossing. Regular drivers of Forty's Pitch may not expect the operation of the crossing and this may lead to failure to stop type incidents (reference LTN 1-95 paragraph 4.2.4).

RECOMMENDATION

It is recommended that an assessment of need for the crossing is carried out. Other forms of pedestrian crossings, such as pedestrian refuges may be more appropriate.

DESIGN TEAM RESPONSE

Information provided to Herefordshire in the form of a PV² calculation clearly demonstrates that a formalised crossing facility is not required, either in the form of a puffin or central refuge.

Following a meeting with HCC they provided further guidance from Cheshire which introduced an updated methodology for calculating the demands for a crossing. This is attached as ***Appendix B****. The associated PV² calculation is attached at* ***Appendix C****.*

Using robust assumptions there is still no need for a crossing. We have assumed 25% of all residents are elderly; 25% are unaccompanied children; 25% have a pushchair; and it takes more than 60 seconds to cross the road. All of which are highly unlikely to be the case.

Finally, the road is not wide enough to be able to provide a refuge. Therefore, the road would need to be widened to provide a refuge, which could lead to increasing vehicle speeds.

2.7 **Location: At the signalised crossing (OBSERVATION)**

There is a Royal Mail Letter box located on the eastbound approach to the crossing which falls within the controlled area of the pedestrian crossing. This may result in people wishing to use the letter box including the Royal Mail operative to stop on the zig-zag markings, which in term may encourage other drivers to illegal overtake parked vehicles.

RECOMMENDATION

It is recommended that the letter box is relocated to the east, away from the crossing.

DESIGN TEAM RESPONSE

Discussions will be held with the local highway authority with a view to agreeing whether or not the post box should be relocated and to where.

Drawings

Existing Layby to be removed

New puffin crossing

1:500

New flag and pole bus stop, position in the verge to the back of the existing footway

New bus stop to be provided to standard specification of the local highway authority. Footway extending east to furthest plot access

1:250

Footway extended to Quarry Lane within limits of public highway

Visibility splays

2.4m x 143m west
2.4m x 126m east

1:1000

REV	DESCRIPTION	DRAWN	INITIALS	DATE

DRAWING STATUS	CHECKED BY	DATE

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Forester House, Doctors Lane,
Henley in Arden,
Warwickshire B95 5AW
Tel: +44(0)1564 793598
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JOB TITLE	CLIENT
Forty's Pitch, Gorsley	North Oak Homes

DRAWING TITLE
Site Access Arrangements
Pedestrian Crossing, Visibility Splays & Footway

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
@A3	DN	Oct 18	16251–11	B

Appendix A

ROAD SAFETY CONSULTING LTD

Stage 1 Road Safety Audit

Forty's Pitch, Gorsley

Site Access Arrangements and Pedestrian Crossing

Date: 05/10/2018

Report produced for: David Tucker Associates

Report produced by: Kevin Seymour, Road Safety Consulting Ltd

Reference: RSC/KS/EB/18001

Document Control Sheet

Project Title	Forty's Pitch, Gorsley Site Access Arrangements and Pedestrian Crossing
Report Title	Stage 1 Road Safety Audit Reference: RSC/KS/EB/18001
Revision	-
Status	Final
Control Date	05/10/2018

Record of Issue

Issue	Author	Date	Check	Date	Authorised	Date
Final	**KS**	**04/10/18**	**EB**	**05/10/18**	**EB**	**05/10/18**

Distribution

Organisation	Contact	Copies
David Tucker Associates	**David Neale**	ecopy

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LE8 6EY
Registered in England and Wales
Company Number 5225549

1. Introduction

1.1. This report results from a Stage 1 Road Safety Audit carried out on the proposed Site Access Arrangements and Pedestrian Crossing on Forty's Pitch, Gorsley, on behalf of David Tucker Associates. The Audit was carried out during October 2018.

1.2. The Audit Team membership was as follows:

Audit Team Leader
Kevin Seymour
B Sc, PG Dip TS, MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd

Audit Team Member
Elaine Bingham,
B Eng (Hons), MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd

1.3. The audit took place at the offices of Road Safety Consulting Ltd between 3rd and 5th October 2018. The audit was undertaken in accordance with the audit brief and the report has been prepared with reference to the Design Manual for Roads and Bridges (DMRB) Highways Directive HD19/15. The audit comprised an examination of the documents provided by the designer and listed in Appendix 1.

1.4. The Audit Team has not been advised of any departures from standards.

1.5. The Audit Team visited the site together on the 4th October 2018 between 1:00pm and 1:45pm. Weather conditions at the time of the audit was sunny and bright. The road surface was dry. Traffic flows were low. No pedestrians or cyclists were observed during the site visit.

1.6. The team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

1.7. All comments and recommendations are referenced to the design drawing and the locations have been indicated on plans in Appendix 2.

2. Items Considered

2.1. Scheme Proposals

2.1.1. The scheme consists of nine residential properties, with a simple give way controlled Tee junction facilitating access on to the B4421, Forty's Pitch, Gorsley. A signalled pedestrian crossing is proposed across the B4421, to the west of the proposed site access. A new footway link is proposed, to link to Quarry Lane and the westbound bus stop near to that junction. New bus stops are proposed to be provided on either side of the B4421, Forty's Pitch.

2.2. Information Provided to the Audit Team

2.2.1. Information that has been provided to The Audit Team, for the purpose of this audit, is as outlined within Appendix 1 of this report. The information included initial design drawings, a Transport Statement and automatic speed survey data.

2.3. Departures from Standards (Design)

2.3.1. The Audit Team has not been advised of any design departures from standards.

2.4. Departures from Standards (Road Safety Audit)

2.4.1. This Road Safety Audit has been produced, in general compliance with DMRB Vol 5 – HD19/15 – Road Safety Audit with the following exceptions.

- A formal Road Safety Audit brief (approved by local highway authority) has not been provided to The Audit Team, however The Audit Team received a supporting email with relevant background data and information and therefore did not consider that the lack of a formal brief would compromise the production of a Road Safety Audit for these proposals).
- Section 4 of this report provides additional Observations, that are outside of the scope of HD19/15 (which specifically excludes the provision of additional comments within Road Safety Audit reports). These comments, whilst considered outside the scope of the audit, have been produced to assist the designer in providing a safe design where any safety comment may be conditional on receiving more detailed information.

2.5. Previous Road Safety Audits

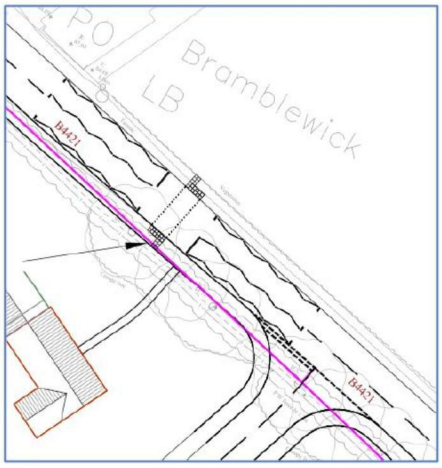
2.5.1. A previous Stage 1 Road Safety Audit was carried out on a development proposal on the site. The development consisted of 26 residential properties. This audit raised two road safety related issues and one item for clarification. These issues have been addressed with the provision of amended design proposals.

3. Items Raised by this Stage 1 Road Safety Audit

3.1. Problem

Location: At the signalled pedestrian (puffin) crossing

Summary: Pedestrian to vehicle collisions



Off-peak vehicle speeds are shown to be in excess of the posted 40mph speed limit. Drivers attempting to stop at the signals may overshoot the stop line, particularly in wet weather conditions. This may lead to failure to stop type pedestrian to vehicle collisions.

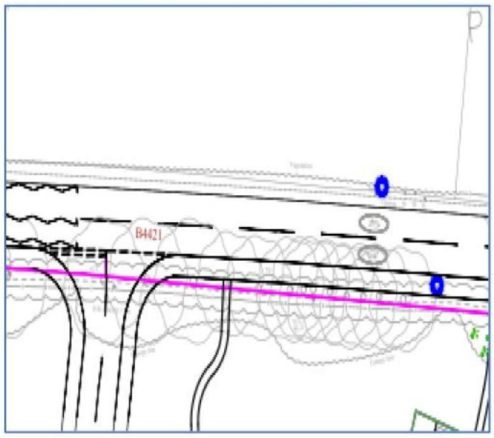
Recommendation:

It is recommended that the signals installation be provided with appropriate speed assessment / discrimination equipment (or MOVA installation) (reference Table 2 LTN 2-95). Appropriately specified skid resistant surfacing should be provided to ensure braking vehicles.

3.2. Problem

Location: On Forty's Pitch

Summary: Pedestrian to vehicle collisions



Two bus stops are proposed, to the east of the proposed development access. Pedestrians are unlikely to use the signalled crossing, away from the direct pedestrian desire line, to access these stops. Pedestrians may be vulnerable to being struck by vehicles as they attempt to cross on the likely desire line.

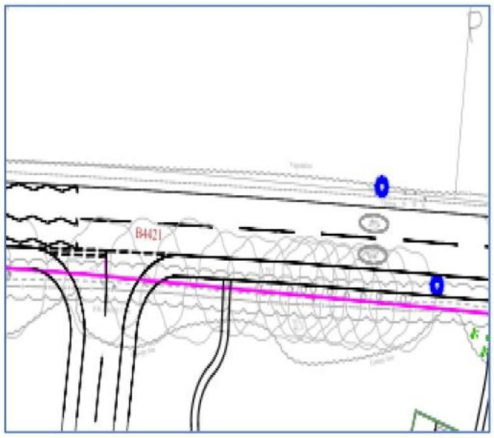
Recommendation:

It is recommended that the bus stops are relocated to maximise the use of the proposed crossing.

3.3. Problem

Location: On Forty's Pitch

Summary: Vehicle to vehicle collisions



Two bus stops are proposed, to the east of the proposed development access. The orientation of the bus stops may lead to the carriageway being blocked, should buses occupy opposing stops at the same time; this may lead to late braking nose to tail collisions.

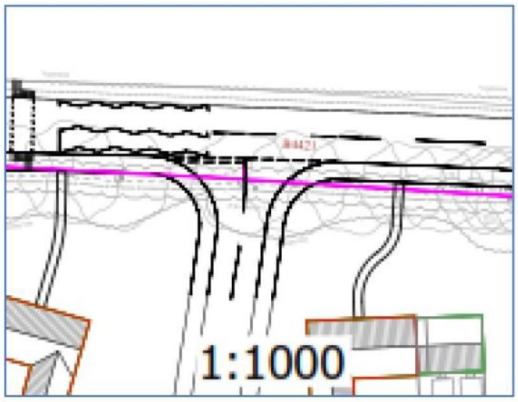
Recommendation:

It is recommended that the bus stops are relocated to maximise the use of the proposed crossing – tail to tail configurations are considered conventional, with a separation of three bus lengths.

3.4. Problem

Location: At the development access

Summary: Pedestrian injury



At the development access, no dropped kerb crossing facilities are indicated for pedestrians. Some users may have difficulty negotiating full height kerbs and this may result in pedestrian trips or falls.

Recommendation:

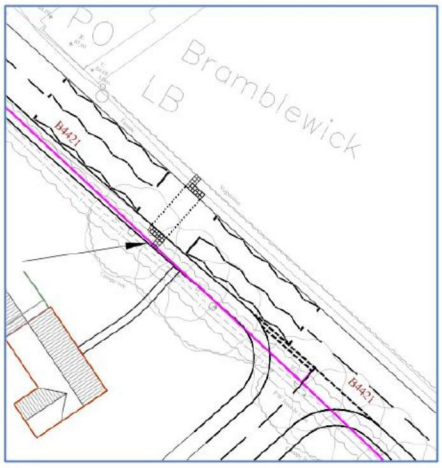
It is recommended that appropriate dropped kerb crossing facilities are provided, with tactile paving to highlight the presence of flush kerbing.

End of Safety Comments

4. Other Observations

4.1. Observation

Location: At the signalled pedestrian (puffin) crossing



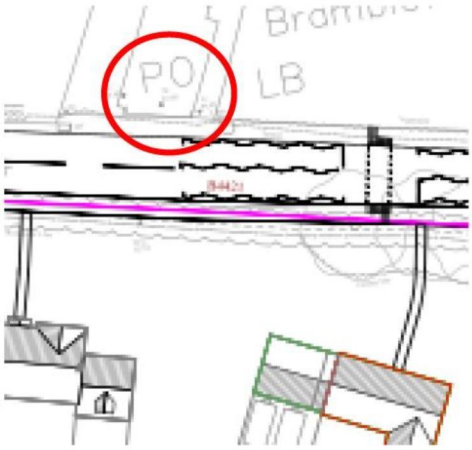
The proposed development consists of only nine residential properties; this level of development is unlikely to generate substantial levels of pedestrian activity and with low levels of existing development there may be a low frequency of operation of the crossing. Regular drivers of Forty's Pitch may not expect the operation of the crossing and this may lead to failure to stop type incidents (reference LTN 1-95 paragraph 4.2.4).

Recommendation:

It is recommended that an assessment of need for the crossing is carried out. Other forms of pedestrian crossings, such as pedestrian refuges may be more appropriate.

4.2. Observation

Location: At the signalled pedestrian (puffin) crossing



There is a Royal Mail Letter box located on the eastbound approach to the crossing which falls within the controlled area of the pedestrian crossing. This may result in people wishing to use the letter box including the Royal Mail operative to stop on the zig-zag markings, which in term may encourage other drivers to illegal overtake parked vehicles.

Recommendation:

It is recommended that the letter box is relocated to the east, away from the crossing.

5. Audit Team Statement

We certify that this Stage 1 Road Safety Audit has been carried with reference to HD 19/15.

Audit Team Leader

Kevin Seymour,
B Sc, PG Dip TS, MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)

Signed: ..... Dated 4th October 2018

Audit Team Member

Elaine Bingham,
B Eng (Hons), MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)

Signed: ..... Dated 5th October 2018

Road Safety Consulting Ltd
4 Paramore Close
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Leicestershire
LE8 6EY

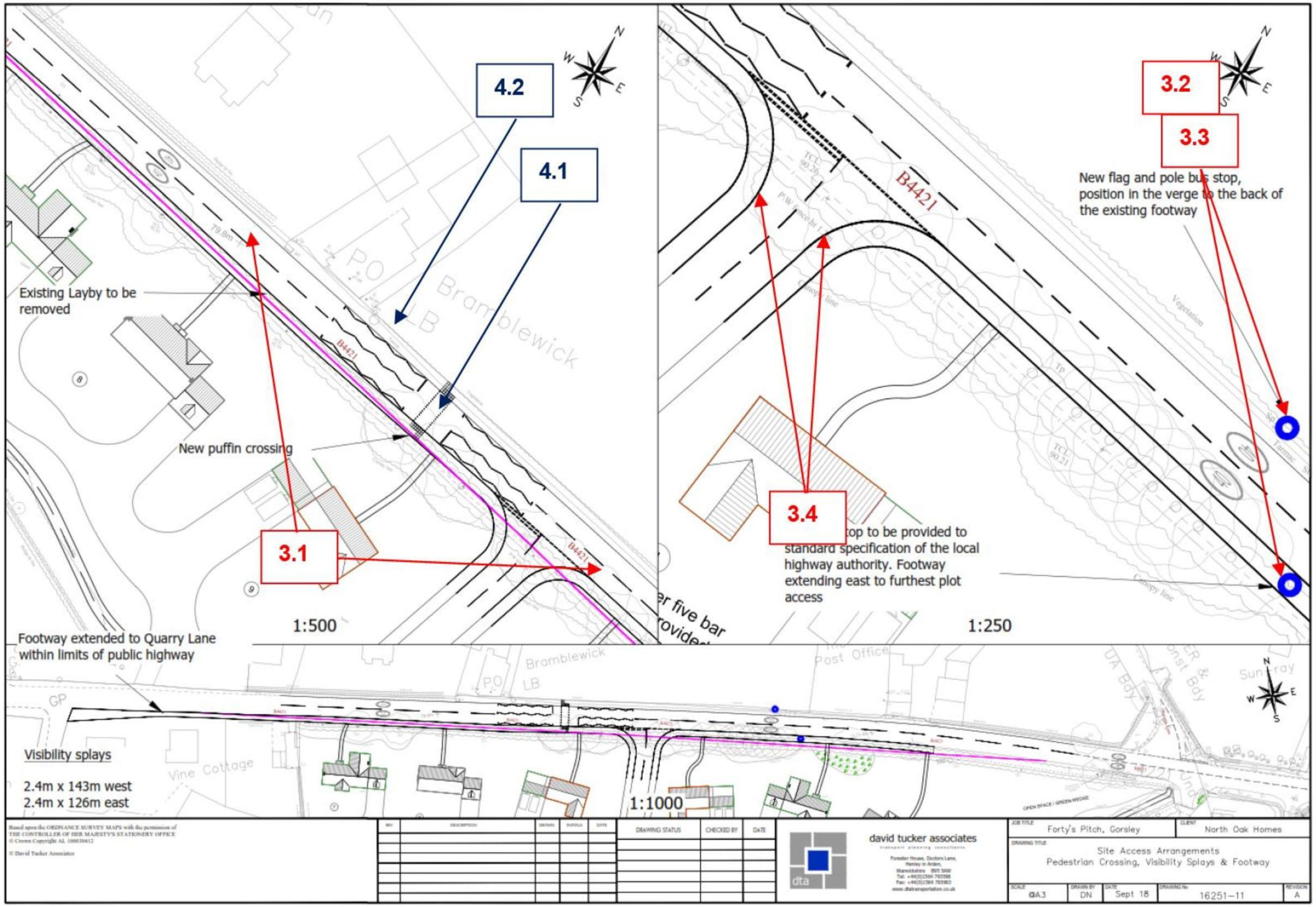
APPENDIX 1: Information Provided

List of Information Provided

- Drawing 16251-11 Rev A – Site Access Arrangements
- Drawing 16251-11-1 Rev - – Site Access Arrangements with Vehicle Tracking
- Document 16251-02 Rev B – Transport Statement

APPENDIX 2: Drawing Showing Problem Locations

Problem numbers shown on the attached drawing refer to Problem numbers within the report.


4.2
4.1
3.2
3.3
3.1
3.4
Existing Layby to be removed
New puffin crossing
New flag and pole bus stop, position in the verge to the back of the existing footway
top to be provided to standard specification of the local highway authority. Footway extending east to furthest plot access
1:500
1:250
1:1000
Footway extended to Quarry Lane within limits of public highway
Visibility splays
2.4m x 143m west
2.4m x 126m east
B4421
Bramblewick
david tucker associates
Forty's Pitch, Gorsley
North Oak Homes
Site Access Arrangements
Pedestrian Crossing, Visibility Splays & Footway
@A3
DN
Sept 18
16251-11
A

Appendix B

APPENDIX 5

ENVIRONMENT STRATEGIC PANEL
3 FEBRUARY 2005

REVIEW OF GUIDANCE FOR PEDESTRIAN CROSSINGS (2005)

Details of the proposed Way Forward

1 The current guidance uses a numerical measure to assess the degree of conflict between vehicles and pedestrians, with a reduced numerical measure for special circumstances. The degree of conflict is determined by multiplying the number of vehicles per hour (V) squared by the number of pedestrians crossing per hour (P) over a 100m section. The average of the four highest hours is taken to represent what is called PV^2. With the introduction of the current national guidance in Local Transport Note 1/95 in 1995, there was a move away, nationally, from the explicit use of PV^2 to a framework approach. However, in Cheshire there was still considered to be a need for some simple, easily understood measure to act as an initial starting point to see if a particular location justifies further investigation and justification for the provision of a controlled crossing. Since PV^2 is a well known and understood measure it is considered appropriate to use the principal of PV^2 but change the starting point to reflect more fully the current national policy guidance, the objectives of the Cheshire Local Transport Plan and the practices in other local authorities.

2 When assessing a request for a crossing then, if the value of PV^2 is less than 0.2×10^8, no formal crossing facilities are required. If the value of PV^2 is above 0.2×10^8 then there should be a more in-depth framework assessment carried out, in line with the advice in Local Transport Note 1/95. This criterion is equally applicable to pedestrian facilities as combined pedestrian and cycle facilities.

3 However to maintain a consistent approach the framework assessment should also be based upon a PV^2 approach. This can be achieved through adjusting the value of PV^2 to take account of the composition of the pedestrian flow, the width to be crossed, the speed limit and 85%ile speed of the road and the difficulty encountered crossing the road in terms of time spent waiting and crossing.

4 However, there are circumstances that the proposed guidance may not fully address the issues of concern such as:

a) close to a proposed new developments ;
b) along a proposed Safer Routes to School route; and
c) along a proposed national cycle network routes.

5 At all the above situations there may be little existing pedestrian or cycle movements. However, as a result of the proposals significant volumes would result. Yet the application of the modified PV^2 calculation would not imply the provision of a pedestrian facility because the number of new pedestrians and/or cyclists generated by the above three circumstances would not be known.

6 Therefore, in these circumstances, due consideration should be given to the provision of pedestrian/cycle crossing facilities if the traffic flow for the four busiest hours is above ***480*** vehicles per hour (two way) or the number of heavy goods vehicles is 300 vehicles per hour (two way) or above. After carrying out a preliminary survey of the proposed site a decision should be reached on whether a crossing is justified or not

based upon experience at previously installed sites, judgement and knowledge of local factors.

7 In addition, where an existing location has a high pedestrian accident rate then, if pedestrian facilities are judged to be most effective remedy, these sites would not be subject to PV2 criteria.

8 In adopting this approach the proposal not only gives an indication of the need for a crossing but also allows for the inclusion of costs to incorporate a ranking between different types of crossing and between two different sites if funding is not immediately available to undertake all requests for crossing facilities in a given year.

Further Details of the Suggested Method

9 In order to take account of the various different classifications of pedestrians it is suggested that a series of factors should be applied to the value of PV^2, which is still calculated as the average over the highest four hours as follows:

EP Percentage of Elderly pedestrians (EP). If the percentage of elderly pedestrians is less than 10%, a factor of 1 should be used. If more than 10%, then use the following formula

$$\frac{(100+EP)}{110}$$

(Elderly defined in terms of visual appearance and is a judgement of the enumeration staff generally taken as over 60)

UC Percentage of unaccompanied children. If there are not more than 10% of unaccompanied children, use 1. If there are more than 10%, use the following formula:

$$\frac{(100+UC)}{110}$$

PW Percentage of pedestrians with prams/pushchairs, wheelchairs or blind (white sticks or guide dogs). If not more than 5% use 1. If more than 5% then use the following formula:

$$\frac{(100+PW)}{105}$$

PB Percentage of bicycles crossing. If not more than 15%, use 1. If more than 15%, use following formula:

$$\frac{(100+PB)}{115}$$

RW Road width. If not more than 7.3m, use 1. If more than 7.3m, use the following formula:

$$\frac{W}{7.3}$$

CT Time to cross (seconds) this reflects the difficulty in crossing in terms of the volume of traffic and complexity of the location (eg presence of junctions or other features). If it takes on average less than26 seconds cross, use 1. If it takes between 26 and 40 seconds to cross, use 1.2; if it takes between 41 and 60 seconds to cross use 1.4; and

If it takes over 60 seconds to cross, use 1.6 (the above crossing times include both waiting time and crossing time).

VS Vehicle speeds; if 85th percentile speed is less than 30 use a factor of 1

If between 30 and 35 use 1.1
If between 36 and 40 use 1.2
If between 41 and 45 use 1.3
If between 46 and 50 use 1.4

NB **before considering the use of surface crossings on roads with 85th percentile speeds greater than 50 mph consider speed reduction measures.**

CS If proposal is located where a road divides a substantial community or is outside a school, clinic, community centre, home for the elderly or busy shopping centre adjust as follows:

Proposed location is on a road that causes community severance or outside a school or clinic, home for the elderly etc then apply 1.1.

If the proposed site is close to two of the above use a factor of 1.25.

If a proposed site is close to three or more of use a factor of 1.4.

Modified Formula for PV^2

PV^2 Adjustment factor (EPxUCxPWxPBxRWxCTxVSxCS)

If adjusted PV^2 is greater than 0.6×10^8 consider either a zebra crossing or a pelican crossing

Below 0.6 consideration of other measures should be given such as narrowing carriageway to aid crossing, central refuges, traffic calming.

Priority Number

10 A priority number can be obtained if the adjusted PV^2 value for a location is multiplied by a standard cost for the particular crossing facility divided by cost of providing a particular crossing facility for a site eg:

$$PV^2 \times \text{adjustment factor} \times \frac{\text{standard cost of crossing}}{\text{Estimated cost}}$$

Type of Crossing	Standard Cost (excluding resurfacing)
Narrowing of carriageway (road markings)	£1,000
Carriageway narrowing	£7,000
Table with associated measures	£6,000
Pedestrian Refuge	£6,000
Zebra crossing	£6,000
Pelican or Puffin	£30,000
Toucan crossing	£30,000

Crossing Options

Where PV^2 is less than 0.6×10^8

Pedestrian Refuges and Road Narrowing

11 Perhaps the simplest form of pedestrian crossing is the pedestrian refuge. This allows both pedestrians and cyclists to cross the road in two halves, reducing the size of gap between vehicles they may require. Although such facilities aid the pedestrian or cyclist crossing the road, they can cause potential problems for cyclist travelling along the road because of the reduced width available for motorised traffic to pass. Refuges are most appropriate where the road is around 10 metres wide.

12 An alternative to the refuge is to use build-outs or road narrowing to assist the pedestrian. Although this does not have the advantage of allowing the pedestrian or cyclist to cross the road in two halves it does reduce the distance the pedestrian would have to cross on the carriageway. It also would allow motorised vehicles the opportunity to pass cycles on the off side because there would not be a central restriction.

Where PV^2 is greater than 0.6×10^8

Zebra Crossings

13 TD 4/79 Pelican Crossings: Pelican Crossing Operations, advised that zebra crossings should be considered where pedestrian flows are 1100 people per hour or less (averaged over the four highest hours) and where vehicle flows are 500 vehicles per hour or less (averaged over the four highest hours). These are still considered reasonable limits in the absence of any other advice or guidance. In addition, LTN1/95 advises that Zebra crossings are usually used where pedestrian flows are relatively low and traffic flows are no more than moderate. The likely effect of a Zebra crossing can be tested by checking the availability of gaps in the traffic. Gaps of around five seconds are needed for an able person to cross a 7 metre carriageway. The school crossing patrol assessment advises that there should be at least four gaps of around 7 seconds in every 5 minute period for there not to be a need for a crossing patrol. This can be considered a reasonable proxy to assess the availability of gaps against for a Zebra crossing.

14 Zebra crossings should not be installed on roads with an 85^{th} percentile speed of 35 mph or above. Zebra crossings should not be considered where there are significant numbers of vulnerable road users such as: unaccompanied children, elderly and people with disabilities. If considering a zebra crossing, it should not be in isolation. It should be in conjunction with additional measures ranging from additional signing/lining to traffic calming.

15 When considering the installation of a Zebra crossing and pedestrian flows are high during the morning peak and at the end of the school day (but relatively low at other times), because of significant numbers of school children, then the presence of a school crossing patrol should also be taken into account when making the choice between types of crossing. A School crossing patrol can assist to ensure there are reasonable gaps for both vehicles and pedestrians. A separate criterion has been adopted by Cheshire County Council for assessing whether a school crossing patrol may be provided. This criterion would also have to be met in the case of introducing a

new crossing patrol. (Further information may be obtained from the Sustainable School Travel Action Team.

16 Zebra crossings are also best avoided on busy town centre streets or outside railway stations since this is likely to result in a constant stream of pedestrians claiming priority. Other forms of crossing such as puffin crossings or pedestrianisation should be considered. In addition Zebra crossings should be avoided in unusual locations such as contra flow bus lanes.

17 The final type of crossing is the PUFFIN or TOUCAN which is a traffic signal controlled crossing for either pedestrians (PUFFIN) or both pedestrians and cyclists (TOUCAN).

Pedestrian Facilities at Signalised Junctions

18 National guidance for the provision of pedestrian facilities at traffic signals is moving towards the provision of pedestrian facilities where the need is justified. Such a need can be both in terms of numbers of pedestrians, number and type of accidents or through a plan to encourage walking such as "Safer Routes to School".

19 Where new signalised crossing facilities are being introduced to the urban or suburban road network or existing signals are being modified (i.e. where one would expect pedestrian activity on a daily basis) it should be the norm that pedestrian facilities are provided on those arms where there is a clear pedestrian need.

Appendix C

	V		P		
	2Way	2Way Factored	Ped	Ped Factored	PV^2
07:00-08:00	470	588	1	2	773495.16
08:00-09:00	597	746	2	6	3067344.96
09:00-10:00	456	570	1	2	736873.20
10:00-11:00	411	514	1	2	612866.50
11:00-12:00	401	501	1	2	400243.74
12:00-13:00	396	495	1	2	403556.18
13:00-14:00	394	493	1	2	464980.33
14:00-15:00	447	559	1	2	708073.14
15:00-16:00	497	621	2	6	2146662.59
16:00-17:00	583	729	1	4	2007469.41
17:00-18:00	621	776	1	4	2310230.62
18:00-19:00	482	603	1	2	882105.19
Ave					**2382927**
Adjusted PV^2					**3475483**
Factored PV^2					**13243796**
Refuge					40000000
Zebra					60000000
Signal					90000000

NO CROSSING IS JUSTIFIED

V Factor 10% HGV @ x2.5
P Factor assume all disabled @ x3
T Factor assume worst case more than 40 seconds @ 1.3
W Factor 6.3m wide existing carriageway
S Factor based on 85th%ile speeds @ 1.3

Factors

Waiting Time	T	1.3
Road Width	W	0.863014
Speed Limit	S	1.3
Accident Record	A	1
		1.458493

EP	25%	1.14
UC	25%	1.14
PW	25%	1.19
PB	15%	1
RW	7.3m	1
CT	>60secs	1.6
VS	50mph	1.4
CS		1.1
PV^2 Factor		3.810635

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