

Design Summary Document Appendix F A13394 - TN101 - Pedestrian Crossing Assessment

Project	A13394 – Barnham Eastergate Westergate
Document Title or Subject	Assessment of Pedestrian Crossing Type at Green Link
Document Reference	A13394 - TN101 - Pedestrian Crossing Assessment
Revision Reference	01
Date	04/05/2021

1 Introduction

- 1.1.1 Pell Frischmann has been commissioned by the Barnham Eastergate Westergate 'BEW' Consortium to provide transport planning and highways consultancy services in connection with emerging masterplan proposals for a strategic residential-led development at land at Barnham/Eastergate/Westergate, (BEW), West Sussex (the 'Site'). The Local Planning Authority (LPA) is Arun District Council (ADC) and the Local Highway Authority (LHA) is West Sussex County Council (WSCC).
- 1.1.2 The A29 is being realigned through the development site in a north/south direction. The northern section of the realigned road is being delivered by West Sussex County Council and is proposed as a 30mph single carriageway road. The southern section is proposed to be designed to the same principles with a 30mph speed limit and a single carriageway road with localised widening for junctions and crossing points.
- 1.1.3 The A29 extension through the site will include a number of new pedestrian crossing facilities, all of which are proposed at-grade. However, a query has been raised relating to the pedestrian crossing facility at the northern green link in terms of whether it would be better provided as a footbridge. The location of this green link is shown in Figure 1 below.

Figure 1 – A29 Link Road and Green Link Location Plan (extract from PF drawing A13394-PF-ZZ-XX-DR-CD-00100)



- 1.1.4 The type of crossing has been carefully considered in this location, including the appropriateness of a footbridge. As the details of the road have been refined through the technical assessment and design process, it has been determined that an at-grade pedestrian crossing would provide a better solution for pedestrians and cyclists.
- 1.1.5 The reasons for this design decision are set out in this Technical Note.

2 A29 Design Principles

- 2.1.1 The A29 realignment through the site will adopt similar design principles to the section of A29 being provided north of the site. It is proposed as a 30mph road, which is consistent with the road speed limit to the north. A 30mph speed limit will make the road more accessible to all road users and avoid creating a severing effect for pedestrians and cyclists travelling in an east/west direction. It is also well established that higher vehicle speeds are linked to more severe road collisions.
- 2.1.2 Detailed traffic modelling has been undertaken for future scenarios up to 2038 when the development is fully occupied as well taking increases in background traffic growth into account. The annual average daily traffic flow is predicted to circa 20,000 vehicles in this future scenario and the road layout has been designed to accommodate this level of traffic flow.

3 At-Grade Crossings vs Bridges

- 3.1.1 The design guidance set out in the Design Manual for Bridges (DMRB) has been used in the design of the A29 link road.
- 3.1.2 DMRB TA 91/05 sets out the design criteria for non-motorised road users and provides a hierarchy of provision for pedestrians and cyclists. Table 3-1 of this document is replicated in Table 1 below. It clearly sets out the preferred order of approach in terms of providing for pedestrian crossing facilities, with a grade separated solution considered to be the last option on the list once all other options have been considered.

Table 1 – Hierarchies of Provision (TA 91/05)

	Hierarchies of Provision for	
	Pedestrians/Equestrians	Cyclists
Consider First  Consider Last	Traffic reduction	Traffic reduction
	Speed reduction	Speed reduction
	Reallocation of road space to pedestrians/equestrians	Junction or hazard site treatment, traffic management
	Provision of at-grade crossings	Redistribution of the carriageway (bus lanes, widened nearside lanes etc)
	Improved pedestrian/equestrian routes on existing desire lines	Cycle lanes, segregated cycle tracks constructed by reallocation of carriageway space, cycle tracks away from roads
	New pedestrian/equestrian alignment or grade separation	Conversion of footways to unsegregated shared use cycle tracks alongside the carriageway

Table 3/1 – Hierarchies of Provision

- 3.1.3 TA 91/05 provides further advice on the selection of the pedestrian crossing type and at para 6.50 states:

“Bridges with steps or steep ramps represent the least suitable form of crossing for disabled people and should therefore only be provided when other forms of crossings (at-grade or underpass) are not deemed appropriate. “

- 3.1.4 This guidance is further supported by the Chartered Institute of Highways and Transportation document ‘Planning for Walking’ 2005 which states:

“Changes in level should be avoided where possible, but when one is inevitable, the needs of those with disabilities must be considered. Bridges, high-level walkways and subways should be avoided, unless they relate naturally to the main entrances of nearby buildings. Subways and footbridges are usually unpopular as they generally require people to deviate from their desire line and can feel threatening and unsafe. There is a move in recent years to remove them and replace them with at-grade crossings.”

- 3.1.5 A research document by Ancaes and Jones entitled Estimating Preferences for Different Types of Pedestrian Crossing Facilities was published in 2018. The project surveyed participants to understand their preferences for at-grade crossings compared to footbridges and underpasses. The document summarised their findings as follows:

“Footbridges and underpasses were systematically rated below signalised crossings. Participants were then asked to choose between walking different additional times to use certain types of crossing facility or avoid crossing the road altogether. The analysis of the choices using a mixed logit model found that on average participants are willing to walk an additional 2.4 and 5.3 min to use a straight signalised crossing and avoid using footbridges and underpasses, respectively. Women and older participants were willing to walk longer additional times to avoid those facilities. Participants only avoid crossing the road if the additional time to use straight signalised crossings is at least 20.9 min.”

- 3.1.6 It is clear from these various documents that grade separated pedestrian facilities are considered to be inferior compared to more direct at-grade crossings in terms of accessibility and convenience to the pedestrian. They are unpopular as they often require ramps to be introduced and pedestrians can feel unsafe when using them. The study referred to above concluded that pedestrians were generally willing to walk further to avoid using a footbridge.

4 Suitability of an At-Grade Crossing

- 4.1.1 Having established that an at-grade crossing would be preferable for the northern green link, a further assessment was undertaken to ensure its suitability for the realigned A29.
- 4.1.2 DMRB TA 91/05 provides criteria for assessing whether the crossing should be formal or informal (informal being dropped kerbs and formal being a controlled crossing such as a zebra or pelican crossing). This criteria is shown in Table 2 below.
- 4.1.3 By the year 2038 an AADT of circa 20,000 vehicles is predicted to be using the section of A29 that crosses the northern green link. As a single carriageway is proposed, the guidance below indicates that a formal crossing would normally be appropriate.

Table 2 – Criteria for Formal vs Informal Crossings (TA 91/05)

Road type	AADT flow (two-way)		
	Normally Appropriate	Potentially Appropriate (see paragraph 6.8)	Not Normally Appropriate
Single carriageway	Below 8,000	8,000 to 12,000	Above 12,000
Dual carriageway	Below 16,000	16,000 to 25,000	Above 25,000
Wide single c'way	-	Below 10,000	Above 10,000

Table 6/1 - Criteria for Suitability of Informal At-Grade Rights of Way Crossings

- 4.1.4 The guidance goes on to state that zebra crossings should be installed where 85 percentile speeds do not exceed 35mph and that stand alone signalised pedestrian crossings should not be installed where 85 percentile speeds exceed 50mph.
- 4.1.5 Either a zebra crossing or signalised pedestrian crossing would therefore be appropriate for a 30mph speed limit. However on balance a signalised crossing is considered to be more suitable for this particular location. Its connection to the green link is expected to attract higher levels of pedestrians and cyclists, including young children compared to other locations along the realigned A29. A signalised crossing will provide a clearer visual warning of the road to the pedestrians and provide greater control over vehicles through use of the traffic signals.

5 Summary

- 5.1.1 Guidance documents and published research clearly indicates that an at-grade crossing is a preferable option compared to a footbridge. At-grade crossings are considered more convenient to use and are more desirable from a personal safety point of view. Pedestrians are often prepared to walk further to avoid using bridges, particularly women and the elderly.
- 5.1.2 The Design Manual for Roads and Bridges has been used to guide the most appropriate type of crossing and the selection of a signalised crossing is supported by the design approach outlined in TA 91/05. Grade separation should be considered last in the hierarchies of provision and the level of traffic flow indicates that a formal crossing would be more suitable than an informal one.
- 5.1.3 The proposed signalised crossing is therefore considered to be the best design solution for connecting to the northern green link.

This report is to be regarded as confidential to our Client and is intended for their use only and may not be assigned except in accordance with the contract. Consequently, and in accordance with current practice, any liability to any third party in respect of the whole or any part of its contents is hereby expressly excluded, except to the extent that the report has been assigned in accordance with the contract. Before the report or any part of it is reproduced or referred to in any document, circular or statement and before its contents or the contents of any part of it are disclosed orally to any third party, our written approval as to the form and context of such a publication or disclosure must be obtained.

Report Ref. A13394 - TN101 - Pedestrian Crossing Assessment

File Path \\Lon-file-01\engineering\133--\A13394-VAA Barnham Eastergate Westergate\40 Reports\Bridge vs At Grade Crossing Note\A13394 - TN101 - Pedestrian Crossing Assessment.docx

Rev	Suit	Description	Date	Originator	Checker	Approver
01	-	Issued to WSCC	04/05/2021	VB	VB	TMcL

Ref. reference. Rev revision. Suit suitability.