AWDM/0961/17 New Monks Farm Site
Non-Motorised Users Design Review
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Non-Motorised Users Design Review

V1.4

4th July 2018

CI-008
1.0 Introduction

1.1 Active Planning and City Infinity have been commissioned by Brighton & Hove Friends of the Earth (BHFOE) to provide support for their objection to the proposed scheme at “Land East Of Shadwells Road At Mash Barn Estate Mash Barn Lane Lancing West Sussex” also known locally as the “New Monk’s Farm Site”, planning authority reference AWDM/0961/17.

1.2 This document is a design review of the proposals in terms of their impact on Non Motorised Users (NMUs) which includes people walking, cycling and riding horses. The modes are variously referred to as pedestrians, cyclists and equestrians. In certain places we also make reference to specific NMUs and sub-groups where there are particular design issues.

1.3 Matters of policy and a summary of these design comments are dealt with by the main letter of objection provided for and on behalf of BHFOE.

2.0 Overview

2.1 BHFOE’s principal objection to the application is that it does not take the needs of people NMUs into sufficient account and indeed, degrades current provision. Chief areas of concern are;

- Loss of the signalised crossing of the A27 Shoreham Bypass at the junction with Coombes Road and the Old Shoreham Road, known as the “Sussex Pad”,
- Creation of a significant diversion for people wishing to cross at the Sussex Pad,
- Quality of the alternative NMU provision along the A27,
- Reliance on an as-yet unapproved route via a proposed bridleway,
- Design and layout of the NMU provision within the development site,
- Design and layout of the NMU provision in the country park.
3.0 Design Guidance & Standards

3.1 In terms of design guidance, the following are of relevance to this planning application and our NMU review;

- Interim Advice Note IAN195/16 “Cycle traffic and the strategic road network” [1] and relevant parts of the Design Manual for Roads & Bridges (DMRB) for changes to the A27,
- West Sussex County Council Local Design Guide - Supplementary Guidance for Residential Development Proposals [2],
- Designing for Walking [3]
- Making Space for Cycling [4]

3.2 The A27 is managed by Highways England (HE) as part of England’s Strategic Road Network (SRN) of motorways and trunk roads. In terms of schemes affecting the HE network (either promoted by HE or third parties as is the case here), network changes are governed by the Design Manual for Roads & Bridges (DMRB) which is a standards-based approach to design.

3.3 The DMRB prescribes how roads, junctions and other features shall be designed and, in some cases, managed. It is split into a number of volumes and documents which are formatted as a series of clauses to provide advice and guidance. Some clauses are mandatory and clearly marked as such.

3.4 HE also publishes Interim Advice Notes (IANs). These stand apart from the DMRB and are released from to time to provide specific guidance. IANs often refer to specific DMRB standards and in some cases, they update or supercede the advice for various reasons.

3.5 IAN195/16 is a standard relating to the Highways England road network whereas the other documents are guidance. The IAN can be considered as useful guidance elsewhere with advice which demonstrates current practice.
The introduction to IAN195/16 states;

“The Strategic Road Network (SRN) makes up a small proportion of the national highway network but has an important role to play in supporting journeys made by cycle as referenced in the Highways England Cycling Strategy.

This document provides requirements and advice relevant to the SRN for the planning and design of infrastructure for cycle traffic and is intended to be used by highway design professionals.”

It goes on to state;

“The purpose of this document is to ensure SRN infrastructure facilitates the convenient and safe movement of cycle traffic crossing or travelling along the SRN, where cycling is legally permitted.”

3.7 The IAN also sets out its relationship with the wider standards within the DMRB including (but not limited to) geometric design, provision for NMUs, grade separation and other facilities. It is our view that this IAN should carry significant weight in this planning application in term of the provision for NMUs within the A27 corridor as a Highways England road and the requirements of the IAN should be taken fully into account. The IAN should be seen as good practice elsewhere.

3.8 Designing for Walking, Making Space for Cycling and Handbook for Cycle-friendly Design are included as reference documents because they are more current than the WSCC Local Design Guide and they provide more detailed and specialist guidance for walking and cycling.

3.9 A Guide to Inclusive Cycling is especially important as it considers how issues faced by disabled cyclists should be dealt with through good design.

3.10 The amount of weight which guidance is given will depend on the situation, however, the age of the document is often important, especially as the design approach to walking and cycling in the UK is constantly evolving.
4.0 Current Walking & Cycling Routes

4.1 This section describes some of the key local walking and cycling routes in the area around the application site.

A27 Shoreham Bypass

4.2 There is a cycle route along the southern side of the A27 between the Lancing Roundabout (Grinstead Lane/ Manor Road) and the Old Shoreham Road. The route is generally along a shared-use cycle track with some elements of on-carriageway cycling at the western end on service roads which run parallel to the A27. At the service roads, there are separate footways for people walking. The western end of the track is poorly laid out, has misleading signage and provision at the roundabout is largely ignored.

Shoreham

4.3 At the eastern end of the A27 shared-use cycle track, the route continues along the Old Shoreham Road to the Old Shoreham Toll Bridge which is a traffic-free crossing of the River Adur. At the eastern end of the bridge, a connection is made with National Cycle Network (NCN) Route 223 which heads north into the Downs Link which is a traffic-free leisure route accommodating people walking, cycling and riding horses (NMUs). Both of these routes are also bridleways. The route has a variation in surface treatment, geometry and width.

4.4 North of the Old Shoreham Toll Bridge, the surfacing is compacted gravel/ fines which deteriorates in width and quality to the north which makes it uncomfortable to cycle on and is it less suitable for some people, especially those using non-standard or adapted cycles. Further north there is a step and tight turn over the River Adur bridge where there is often congestion where it connects with the South Downs Way (National Trail).

4.5 Heading southeast from the eastern side of the Old Shoreham Toll Bridge is local cycle route 79 which links to Shoreham Station. The crossing of the A283 at the Amsterdam Inn is narrow and with the route not being particularly legible with people cycling having to mix with traffic. From Shoreham Station, NCN2 runs east and west along the coast. In addition, the Downs Link passes the eastern side of the Old Shoreham Toll Bridge and continues to the south.
**Sussex Pad Junction**

4.6 The existing junction of the A27 Shoreham Bypass at the junction with Coombes Road and the Old Shoreham Road is staggered crossroads with the A27 running approximately east-west (The Sussex Pad junction); Coombes Road running north on the eastern side of the junction and Old Shoreham Road running south on the western side the junction. There is a signalised pedestrian crossing between the Coombes Road and Old Shoreham Road arms. On the north side of the junction, there is a direct link from the signalised pedestrian crossing to The Drive and Lancing College beyond.

4.7 The junction has been highlighted locally as an important and direct crossing of the A27 for people walking, cycling and riding horses as it provides a relatively flat, high-capacity and accessible route to the South Downs and Low Weald. Old Shoreham Road connects to a traffic-free crossing of the River Adur to the southeast which in turn provides access to Shoreham and beyond. To the north of the junction, Coombes Road provides access to Lancing College and quieter lanes beyond.

4.8 The Sussex Pad has been highlighted by a number of groups as being an important crossing of the A27 such as Bricycles [7], The British Horse Society [8] and Lancing College [9]. Local users consider the crossing to be the best way to cross the A27 as one leaves the Shoreham/ Hove/ Brighton conurbation because in terms of experienced safety, traffic flow/ speed and topography, it is far superior than other crossing points.

4.9 Photographs 1, 2 and 3 (below) were taken on 30th June 2018 and depict some of the group rides which make use of the Sussex Pad Junction to cross the A27. Further discussion of its importance locally is set out in Sections 5 and 6.
Photograph 1 – Cycle group (Southbound).

Photograph 2 – Youth cycle group (northbound on Coombes Road).
5.0 Sussex Pad Junction

5.1 The key highway layout proposals are as follows;

- Changes to Sussex Pad Junction,
- Alternative footpath scheme to east of the Sussex Pad Junction,
- A new signalised 3-arm roundabout junction on the A27,
- A new roundabout to the south of the A27 providing a new connection to the Old Shoreham Road and access to development land further south and west,
- A further 3-arm roundabout (even further south) to provide a spur to a proposed retail development site,
- Link road into residential development,
- Path layout within the proposed country park.

5.2 We have also reviewed the details shown on Civil Engineering Practice Drawings 2800G “Section 38 and 278 Agreement Plans” [10], 2401B “New Access Road Plan and
Longitudinal Section Sheet 1 of 2” [11] and 2402B, “New Access Road Plan and Longitudinal Section Sheet 2 of 2” [12]. From a walking and cycling point of view, it appears that where the main road network is concerned, this will be provided for by 3 metre shared-use cycle tracks.

5.3 The application seeks to rearrange the junction so that the Coombes Road arm becomes a left-in/ left-out access with the Old Shoreham Road arm removed. This in turn means that the signals and therefore pedestrian crossing will also be removed.

5.4 As commented on in 4.6, a clear desire line exists for NMUs and so any alternatives which don’t similarly satisfy this desire line are unlikely to be acceptable to users. Unless NMUs are physically prevented from crossing at this location, then it is reasonable to expect that some will continue to do so and so future safety issues are likely; especially given the proximity of Lancing College.

5.5 The loss of the crossing without the desire line being properly accommodated is a chief reason why BHFOE objects to the application. The proposals suggest that NMUs coming from Old Shoreham Road will have two options;

- Divert to the west using the existing shared-use cycle track on the A27 to the proposed roundabout. Cross the roundabout using a series of toucan crossings and then return east on a new shared-use cycle track; or

- Use an existing footpath (proposed to be changed to a bridleway) from the western side of the Old Shoreham Toll Bridge which runs north under the A27 and then west along a new bridleway to the north of the A27, connecting to Coombes Road.

The latter is the subject of a separate and yet to be determined planning application (reference SDNP/18/00434/FUL [13]). BHFOE have objected to this proposal in its own right [14] because of the alignment, width and proposed details of the route.

5.6 The diversion route using the roundabout forming part of this application would essentially create an NMU diversion distance of some 1,100 metres which equates to a walk of around 13 minutes or a cycle of around 3 minutes. Crucially, this excludes waiting
time at the toucan crossings proposed at the new roundabout, of which there are four. It is not clear at this point if a proposed method of control has been proposed, although given the roundabout forms part of the detailed application this should be made available for review as the crossing times will greatly influence the usefulness and utility of the layout. Given the number of crossings, it is likely that delays could be considerable. For equestrians, the arrangement completely excludes them.

5.7 The diversion route via the proposed bridleway will be some 350 metres which equates to 4.25 minutes to walk and just under 1 minute to cycle. While there is no waiting time associated with this diversion, there are significant issues with it which will be summarised below.

5.8 Of particular relevance to the current application is IAN195/16 “Cycle Traffic & The Strategic Road Network”. The IAN is relevant in terms of the proposal to close the Sussex Pad crossing, the proposed alternative routes and the proposed signalised roundabout to the west of the Sussex Pad crossing.

5.9 Section 2.4 (“Cycle Traffic at At-Grade Junctions and Crossings”) of the IAN is particularly relevant with regard to the proposal to close the Sussex Pad Junction to walking and cycling. Table 2.4.2 deals with the available options for crossing based on the particular circumstances.

5.10 The Department for Transport publishes traffic flow data for the SRN and there is a count point immediately west of the junction. Count Point 6298 provides Annual Average Daily Traffic (AADT) data and is essentially a simple measurement of how busy the road is. For 2015 (the last manual count), the AADT was 58,489 motor vehicles. The estimated AADT for 2016 was 60,408 motor vehicles.

5.11 The National speed limit applies and so Table 2.4.2 sets the preferred cycle crossing as “grade separated” with no alternative and so the Sussex Pad Junction (in terms of a cycle crossing) doesn’t meet the current standard. As far as we are aware, the proposal to close the junction maintains the current speed limit. If reduced to 50mph (as being suggested for the western approach to the A27 roundabout) then a signalised crossing becomes an “other possible crossing” from the Table.
5.12 In Designing for Walking, Table 3 gives guidance on pedestrian crossings for different road speeds and traffic flow conditions. The Sussex Pad Junction is subject to the National Speed Limit and has a high traffic flow. For pedestrians, this would suggest that grade separation is “generally acceptable”, with signalised crossings at junctions being “design with care”.

5.13 For NMUs, the removal of the junction strongly suggests that grade separation is the appropriate treatment. BHFOE are supportive of grade separation in principle, but they object to the mitigation options put forward in the application.

5.14 Grade separation has the advantage of removing delays for drivers and NMUs and can be a significant improvement for experienced safety. Grade separation needs to maintain the desire line otherwise it will be a degradation of directness. It also relies on ramps of an appropriate gradient to be fully inclusive and the width must be appropriate for the expected user types and use (which also applies more generally).

5.15 The IAN gives detailed requirements for grade separation under Section 2.5 which is broadly split between providing bridges or underbridges. For similar general ground levels, overbridges will require longer ramps because of the headroom required over a carriageway whereas an underbridge requires less headroom (even where people are riding horses as could be the case here. The IAN suggests that two-way cycle tracks should be a minimum of 3m wide with appropriate buffers. Wider underbridges also help ensure a better user experience and light wells in central reservations can also assist.

6.0 Diversion Via Eastern Footpath

6.1 One of the options given as NMU mitigation for the closure of the Sussex Pad Junction is the proposal to change the existing footpath (Footpath 2049) which commences at the western side of the Old Shoreham Toll Bridge to a bridleway which appears to form part of this application.
6.2 In parallel, there is a planning application with the South Downs National Park Authority (SDNPA) for the construction of a new bridleway way between Footpath 2049 and Coombes Road.

6.3 For the conversion of the existing footway, the Vectos Drawing VD14260-SK-0101C “General Arrangement Option A - 2.5m Shared Use Footway/ Cycleway” [15] shows a 2.5m wide shared-use path. It would ramp down from the western side of the Old Shoreham Toll Bridge (gradient unspecified) and continue north along the existing path to the west of the River Adur.

6.4 The section through the proposed shared-use path suggests a minimum width of 0.5m between the edge of the path and the top of the bank to the river which demonstrates the constraints of the route. At 2.5 metres, we consider the path to be too narrow for shared use because it will become a point of conflict between people walking and cycling as well as with equestrians. Because the proposed route is against the river wall (Ricardo’s Flood Defences), people cycling will not be able to utilise its full width for fear of catching their handlebars on it. Equestrians will have a similar issue too and the width creates concerns in terms of horses being “spooked” with other people passing in such a narrow corridor. This means the effective width is only 2 metres as 0.5m is unavailable for cycling or riding because of the adjacent wall.

6.5 In Vectos' Response to Objections note, May 2018, [16] reference is made to the Sustrans’ Handbook for Cycle Friendly Design in terms of supporting the proposed width. The diagram on page 22 suggests a 3m width for a “main route” with 1m mown verges. Table H8 gives some recommendation on widths and for “urban fringe/ semi-rural” situations, 3m is the preferred width. Table H2 also gives additional information on the additional clearances required for cyclists and where there is vertical feature above 600mm, an additional 500mm is required which is the same requirement as set out in the IAN. As explained in Section 13, a 4m shared-use NMU route is considered appropriate because of the likely use for walking, cycling and equestrians.

6.6 The shared-path will continue under the A27 (as the footpath currently does) by dropping down on a 1 in 16 slope (over 17m) to provide headroom of 3.4m under the A27. A 1 in 16 slope to be too steep to be fully inclusive and will be difficult for some people to
use, especially with non-standard and adapted cycles. The headroom for equestrians is substandard. TD36/93 of DMRB [17] states in Section 4.10;

“Where bridleways are to be incorporated into subways, the minimum headroom should be 3.7m except where suitable facilities for the riders to dismount and remount are provided, when the headroom may be reduced to 2.7m. Suitable signs should be erected to indicate that equestrians are required to dismount if the latter option is adopted. The minimum width of a subway for equestrian use should be 3.0m.”

6.7 Expecting people to dismount is not conducive to their comfort and safety and so unless the appropriate headroom is provided, this alternative is substandard and therefore a critical design failure. In addition, TD36/93 adds weight to the objection of this section of the route in terms of path width as commented on under 6.4 above. The physical parameters provided by TD36/93 do not change whether part or not part of a scheme explicitly covered by the DMRB.

6.8 For the new section of bridleway between Footpath 2049 and Coombes Road, the proposal is for a shared-use path. HED Drawing HED-1172-LA-604-00 “NMU Route Cross Section”[18] gives some a general arrangement which comprises a 3m shared-use path with a 1:30 crossfall and surfacing of either an asphalt concrete surface course or a rolled gravel. There would be 0.25m verges either side and a fence on one side (0.25m from the path edge). The path would be retained by pegged timber edging.

6.9 We consider a crossfall of 1 in 30 to be far too steep and will create difficulties for some people walking and will be difficult for some people to cycle along, especially where their speeds might be lower than a “design speed”. Steep crossfalls are especially problematic for people using tricycles. A Guide for Inclusive Cycling suggests (p21) that;

“Three wheelers are particularly adversely affected by steep cambers and can end up in the gutter or even overturn”; and

“Paths used for cycling should have the gentlest camber possible to facilitate comfortable and safe cycling, whilst allowing for drainage. A maximum cross fall of 1:40 is recommended for paths used for cycles.”
6.10 It is not certain what surface is to be provided, but we have concerns about the use of gravel which is not fully inclusive and will be difficult for those using non-standard and adapted cycles. Vectos in its “Response to Objections” note (paragraph 4.8) states;

“[T]he proposed sealed surface with gravel rolled-in would be acceptable for the multiple users provided that it is sufficiently hard wearing and is rolled to provide a positively textured surface that is smooth enough not to cause injury but provides the required level of resistance, particularly for a shod horse.”

6.11 Unless a smooth surface is provided, then this approach will not be inclusive for all cyclists and furthermore suggests that there should be separate provision for walking/cycling and horse riding because of competing requirements.

6.12 The form of construction shown on the HED drawing does not sufficiently support the pavement layers. Unless the sub base projects beyond the surfacing layers, failure in the haunch is likely over time, especially if accessible by maintenance vehicles. In time, this will impact on the accessibility, utility and comfort of the route.

6.13 We consider 3m to be too narrow for a shared-use path, although given the constraints next to the River Adur for the conversion of Footpath 2049 only being able to achieve an effective width of 2 metres (because of the river wall sterilising 0.5m), this point is academic.

6.14 The only alternative solutions from a technical point of view would be to create a second river wall behind which a route of an appropriate width could be constructed or a pontoon/structure arrangement to provide the route on a continuous engineered structure to sit independent of the general ground levels and tidal edge of the Adur. Neither solutions are considered practical.

6.15 We also have concerns about the potential for flooding of the alternative route because of the path’s position being between the river wall (flood defence) and the river. We are especially concerned where the route passes under the A27 something which the Environment Agency notes in its response to the SNDPA application [19];
“According to Environment Agency flood maps and records the route of the proposed cycle route is shown to be potentially at risk to tidal flooding should the river defences breach or overtop and on particularly high spring tides in the vicinity where it passes under the Shoreham flyover”.

6.16 We have already set out the undesirability of the route as mitigation for the loss of the Sussex Pad Junction crossing and this is a key aspect of BHFOE’s objection. However, BHFOE do not necessarily object to the proposals as an addition to the local footpath network, but it certainly cannot be made suitable for cycling and equestrian use.

6.17 However, the width, geometry and proposed construction of the route is poor. Table 2.2.11 of the IAN sets out desirable minimum widths for 2-way cycling as 3m where peak flows are less than 150 and 4m where it is greater. There is a relaxation in both cases of 0.5m for a maximum of 100m.

6.18 Table 2.2.11.1 also adds sideways clearances for different edge constraints. For a vertical constraint above 600mm high (i.e. the river wall) an additional 500mm is required. This is to ensure people cycling do not clip the feature with pedals or handlebars and allows the full width of the path to be used.

6.19 The proposed changes to Footpath 2049 would see a shared-use path with an effective width of 2m for nearly 400m (0.5m is sterilised for cycling because of the river wall). The new bridleway from the north of the A27 flyover to Coombes Road at a distance of around 480m would be 3m. Because of the proposed fencing being set 0.25m from the path edge, the effective width would be 2.75m.

6.20 There is dispute in how popular the route would be because BHFOE contend that the data gathered by Vectos is not representative; for example, no data was collected on a Sunday and the Saturday data was not for a whole day. In paragraph 4.2 of Vectos’ May 2018 note, it states that its own data shows 31 and 78 two-way crossings of the Sussex Pad Junction by people walking and cycling respectively (June 2016 data) and Lancing College’s estimate of 250 college movements is dismissed.
6.21 A count was undertaken by BHFOE on 30th June/ 1st July 2018 and this showed;

- 340 cyclists and 55 pedestrians used the crossing on Saturday (8am - 7pm),
- 522 cyclists and 70 pedestrians used the crossing on Sunday (7.45am - 8pm),
- The busiest hour for cycling over the weekend was 11.30am to 12.30pm on Sunday with 107 cyclists counted,
- The counters noted that there were occasions where people crossed in large groups (10 or more people walking or cycling),
- 3 equestrians were counted on the Sunday morning.

Our observation is that even with peak hour flows of under 150 people per hour, the absolute minimum width of the path should be 3m, plus 0.5m next to the river wall or fence north of the A27. The current crossing would appear to be less favoured by equestrians, but it is hardly surprising given the layout, lack of high level push button and exposure to traffic crossing entails.

6.22 Given the route is certain to be used by people walking and riding horses (and especially in groups), additional space would be required to make the route safe and comfortable to everyone. Section 4.2 of Designing for Walking gives advice on footway widths with a desirable minimum of 1.8m - this would be in addition to a cycle track of a minimum of 3m. The IAN also sets out details of layouts with a stepped footway to ensure decent separation between people walking and cycling. This area of discussion is about a minimum level of comfort for users rather than trying to mix people at the minimum cycle track width. The Sustrans’ guidance for a shared NMU route recommends 4m for use by groups of NMUs which must be the minimum requirement here.

6.23 The geometry of this route has significant issues. The gradient of the ramp down from the western end of the Old Shoreham Tollbridge is not specified and the ramp down under the A27 is 1 in 17. Designing for Walking suggests a maximum gradient of 1 in 20 (Section 6.6 for Grade Separated Crossings) and even this may be too steep for some
uses. A Guide to Inclusive Cycling suggests that ramps should be minimised as far as possible (p21). Some cyclists cannot dismount or push their cycles and so layouts should be designed with their needs in mind. Table 2.2.9 in the IAN suggests a 5% gradient (1 in 20) can be achieved for a maximum distance of 30m; this is also the maximum gradient set out in the IAN. There is also a tight 90° turn from the bridge onto the path.

6.24 As the route turns west towards Coombes Road after the A27, we estimate the route to curve with an internal radius of around 10m. Near the western end it turns north with a curve of internal radius of about 4m. Table 2.2.7 of the IAN recommends a minimum curve of 14m at the lower design speed. The tighter curves will require people cycling to slow and lose momentum which adversely affects comfort.

6.25 Where the route connects with Coombes Road, it is some 100m north of the A27 and requires people to join the carriageway with a 90° turn. The users of non-standard or adapted cycles will find this turn very difficult and other cyclists and equestrians will find it awkward. No opportunity has been taken to connect the route close to the A27 where it would connect to the path leading directly to Lancing College and the current proposal makes such access awkward for cyclists and equestrians with having to turn to get to it. Cyclists heading south along Coombes Road will also lose momentum because of the turn. The layout should allow flowing access which would bypass those coming the other way waiting to turn right to join Coombes Road.

6.26 As discussed in 6.7 and 6.8, there is concern about the potential for gravel surface or a sealed surface with gravel rolled in and 1 in 30 crossfall. A Guide to Inclusive Cycling (p19) provides commentary on the undesirability of uneven surfaces in terms of their impact on disabled people. They also state that a maximum gradient of 1 in 40 is required. Steep crossfalls are especially problematic for tricycle users who are placed off-balance.

6.27 Vectos has responded to earlier objections in its Response to Objections, May 2018 note. We have concerns that some of the arguments advanced rely on lack of objections from public bodies and that minimum dimensions are used by default, rather than properly assessing user need. The basic physical space required in each has not been properly assessed and conflict is created because NMUs are expected to share the
same space. In some cases, our assessment as set out in this section suggests that there are issues which are critical design failures.

6.28 The key concerns we have with the Response to Objections are as follows;

- A lack of objections from statutory bodies does not mean that proposals are of an appropriate quality and cannot be taken as endorsing a design approach,

- The “sealed surface” of the footpath link/ diversion only meets an effective width of 2 metres because of the 0.5m “stand off” required for cyclists because of the river wall. Even if this route were to be 3m plus 0.5m buffers on both sides, we do not consider it wide enough for shared use. With the space available, this section cannot physically be made fit for purpose without river works.

- At 3m wide, the path north of the A27 has an effective width of 2.75m because only 0.25m is provided as a buffer to the fence. Again, even 3m is not considered wide enough for shared use by all NMUs. Sustrans’ guidance is quoted, but a minimum is chosen to fit the design layout and not the needs of NMUs.

- TA90/05 [20] is quoted in terms of 2m for shared-use having “operated satisfactorily”. In fact, this comes from Paragraph 7.16 which concludes with “[h]owever, the preferred minimum width for an unsegregated facility is 3.0m.” Following paragraphs restate the need for 0.5m “verges”.

- A headroom of 3.4m is suggested, whereas for equestrian use, 3.7m is required (as explained and referenced in 6.6 above).

- TA90/05 states in Paragraph 5.4 deals with gradients. For shared routes a 3% (1 in 33) gradient is prefered or 5% (1 in 20) being the maximum. 1 in 16 is proposed.

- There is discussion on the time-based merits of the two diversion routes which have been covered under 6.22 above. What is not apparent is the proposed method of control for the A27 and therefore the how long it will physically take to cross the A27 over 4 toucan crossings (covered in 7.6 and 7.7 below).
• 5.12 of the Vectos document suggests that for a bridge or subway, the approach ramps at 100m would “result in unnecessary environmental impacts”. In fact, the scheme proposals are for a large roundabout which compared with an underpass must surely create a larger impact.

6.29 We reiterate that the alternatives appear to have been designed to or below standards and relevant guidance rather than by considering the needs of NMUs and setting design objectives accordingly. Where the issues have been challenged by objectors, the response has been to select parts of standards and guidance which appear to fit the response rather than embracing the full advice provided in those documents.

7.0 A27 Roundabout

7.1 The roundabout is a large, signalised 3-arm arrangement with signal control at the 3 entry points and with corresponding signal control on the circulatory area adjacent to each entry point. There is also a signal control point on the southern exit from the roundabout to provide a toucan crossing. In all, there are 7 stop lines. NMUs are provided with toucan crossings at 5 of the signal control points. The two A27 exits from the roundabout are not signal-controlled.

7.2 The geometry and number of traffic lanes approaching and within the roundabout, together with the geometry are designed to maximise traffic flow which will be a key requirement of Highways England for the A27. There do not appear to be any staging diagrams provided with the planning application and so we cannot comment in detail on the method of control. However, it is likely that the A27 will take priority over the southern arm of the roundabout and in all cases, stacking space has been provided.

7.3 The general arrangement of the junction suggests that this will be via a “walk with traffic” method of control with the southwestern and northwestern pairings of toucan crossings. In essence, as the traffic runs on green, the parallel toucan will also run, although it is not clear how much influence push button demand will have in gaining crossing priority within the overall method of control.
7.4 The southern exit from the roundabout has a toucan crossing which will separately stop traffic to allow NMUs to cross (so is not walk with traffic) and so this is likely to be demand led. What we cannot be clear on, however, is how these 2 pairs of toucan crossings and the standalone toucan crossings will operate within the roundabout.

7.5 People walking and cycling from Old Shoreham Road wishing to cross the A27 would have to use 4 separate toucan crossings and depending on how the signals are set up, means that it could take some time to navigate the movement. For NMUs proceeding east-west along the existing shared-use cycle track, the addition of the roundabout will create delays given the route is not currently interrupted. BHFOE are concerned that this arrangement will create significant delays for NMUs trying to navigate the roundabout.

7.6 The Vectos response to the objections to SDNP/18/00434/FUL suggests in paragraph 5.4 that;

“Dedicated crossing infrastructure is proposed at the new A27 roundabout and the much shorter signal cycle time at the roundabout (60 seconds compared to over 120 seconds at Sussex Pad) will result in an overall reduced crossing time.”

7.7 As no other supporting information is available, it is not possible for us to comment on this in detail. However, the cycle time is not the same as crossing time because an NMU would have to approach the first crossing when it is green for them. For example, coming from the southwest, they would cross at the first green to the splitter island. They would wait for the next green to reach the inside of the roundabout island and then encounter another green to get to the next splitter island and then encounter a green shortly after. Nothing is provided to show this to be the case and it also would discount the toucan crossing on the southern exit (for NMUs coming from the southeast) because this is likely to be standalone.

7.8 In addition to the lack of information, the final decision on how the method of control will be applied to the roundabout will lie with Highways England which will be concerned about maintaining flow along the A27 and so the debate is academic in the absence of HE’s position.
7.9 The NMU provision approaching and through the roundabout appears to be provided using shared-use cycle tracks which generally have a verge buffer from the carriageway. For people cycling, they will have to turn through 90° to move between the cycle track and toucan crossings. Toucan crossings require users to register demand with a push button and so with the usual arrangement of the toucan crossing push buttons and the requirement to turn through 90°, some users will find the arrangement awkward. The users of non-standard or adapted cycles will be particularly affected by this.

7.10 BHFOE object to the use of the roundabout as forming a diversion to the closure of the Sussex Pad Junction crossing. As a principle, the new roundabout could open up more access to the north of the A27 as an addition to the local NMU network and could help with connectivity. However, BHFOE object to the current layout and the method of control for NMUs because of the number of separate crossings which have to be negotiated.

7.11 It is not absolutely clear, but it appears that NMU provision at the roundabout consists of 3m shared-use cycle tracks with buffer verges. As described above, 3m is the desired minimum where 2-way cycling is to take place where peak flows are under 150. This does not take into account the needs of people walking and indeed riding horses.

7.12 Drawing 2402 B appears to show the toucans crossings as 2.4m wide which is far less than the minimum width of 4m suggested by Local Transport Note 2/95 [21]. The IAN also comments on toucan crossings more generally, stating;

“Toucan crossings are less comfortable for both pedestrians and cyclists than separate crossing facilities. They shall only be used where it is necessary to share the same space at the facility, for example where there is a shared path leading to the crossing or where there are complex off-carriageway pedestrian and cycle movements that are best accommodated in a shared use area.”

7.13 Separation of walking and cycling is desirable, although there may need to be judgement on how far people are prepared to walk. Very low numbers of people walking and low levels of people cycling may not be too much of an issue when using a 3m shared-use cycle track. As soon as walking levels increase, then conflict with people cycling arises. When cycling levels increase, there may be safety risks for people walking.
7.14 Section 2.2.4 of the IAN introduced the concept of the “design vehicle” for cycling which is 2.8m long by 1.2m wide. Figure 2.2.4.1 shows the variety of cycle types that the design vehicle takes into account. The main implication of this at the A27 roundabout is the toucan crossings which will require people cycling to turn through 90° and to use a push button. The shared-use nature and apparent narrow width of the buffer verge means that the turns to use the crossings will be difficult for some users.

7.15 The likely position of the push buttons associated with toucan crossings are likely to disadvantage those using non-standard or adapted cycles in terms of their seated position in relation to the push button. Some users will not be able to dismount to press the button and we consider this layout to be a critical design failure which will exclude some users. A Guide to Inclusive Cycling covers this point (p23);

“Sections of the road network that are not continuous, or that require the cyclist to make awkward manoeuvres or dismount, pose a significant barrier for disabled cyclists.”

8.0 First Development Roundabout & Link South of A27

8.1 This is a “normal” roundabout and is situated a short distance south of the A27 roundabout and both are linked by a dual carriageway link road with 2 lanes in each direction. The approach to the A27 roundabout flares to 3 lanes for traffic capacity reasons.

8.2 The dual carriageway maintained the shared-use cycle tracks on each side for NMUs with a verge buffer from the carriageway. The eastern arm (which connects with the Old Shoreham Road) has a shared use cycle track on its northern side. The southwestern arm has a cycle track on its northwestern side. To the southeast of the roundabout, there is a short section of cycle track connecting two crossing points for NMUs.

8.3 The roundabout itself has 2-lane approaches with the northern and southern exits also being 2-lane. The geometry of the roundabout is conventional and designed to maximise capacity; however, this arrangement can lead to higher entry and exit speeds.
For NMUs, the south western and eastern arms are provided with uncontrolled crossing points set back from the roundabout. The south western arm has a separate crossing of the entry and exit whereas the eastern arm has a single stage crossing.

This layout will take NMUs away from their desire lines (especially on the eastern arm). Two lane approaches to roundabouts are harder for people to cross than single lane approaches, especially in situations where one lane is slow moving and can “mask” people crossing. Two lane exits from a normal roundabout can involve higher traffic speeds which make it hard for people to find gaps - especially older and younger people who find it difficult to judge speeds. The crossing point of the eastern arm could also be difficult for many people as they will have to find gaps in two traffic directions at once.

The arrangement of the shared-use cycle tracks means that NMUs coming from the southwest and who wish to head east towards Old Shoreham Road have to use 3 uncontrolled crossing points.

The crossing of the eastern arm means that people walking and cycling also have to cross the entrance to the traveller site which has been designed as a junction access with priority over walking and cycling. Having the shared-use cycle track to the south of this road would negate the need to cross the entrance to the traveller site.

Although the IAN would not apply as a HE standard outside of the A27 corridor, it nevertheless provides useful advice and an indication of best practice.

We would restate the difficulties that the users of some types of cycle (as set out in the IAN) will have with performing tight 90° turns to use the uncontrolled crossing points. Of particular note, the crossing point to the commercial site has a refuge unlikely to be large enough for the design cycle. In both cases, this is considered to be a critical design failure which will exclude some users.

With regard to the uncontrolled 2-lane roundabout entries and exits mentioned earlier, the advice in Designing for Walking (Section 6.2) notes the safety risks;
Multilane approaches to at-grade crossings (including bus lanes) can be a problem when slow-moving traffic in one lane “masks” people crossing from drivers in the faster-moving lane. If this is likely to be an issue, then signalised crossings should be considered, although the signal arrangements need to be reasonably visible to all drivers.

8.11 On matters of design, the West Sussex County Council Local Design Guide - Supplementary Guidance for Residential Development Proposals does not provide any local advice on the design of walking and cycling networks and therefore we suggest that it is reasonable to rely on national and expert-led design guidance as has been utilised in this review. Section 3.3.2 makes reference to walking and cycling in detailed masterplans, but the guidance is silent in terms of detail.

9.0 Second Development Roundabout

9.1 This is another normal roundabout a short distance to the southwest of the one previously described. The two are linked by a single carriageway with 2-southwest-bound traffic lanes and one northeast-bound. The geometry is designed to maximise traffic capacity, although traffic speeds are likely to be lower than the previous roundabout as the geometry is tighter.

9.2 The roundabout is provided as the traffic access to a large commercial development. The only crossing point for NMUs is the development access. The crossing is in two parts with a refuge, but the refuge appears to be narrow and unlikely to be suitable for all users to wait on it, especially those using non-standard or adapted cycles and is therefore considered to be a critical design failure.

10.0 Link Road to Residential Development

10.1 This road continues to the southwest and then west of the second development roundabout. It is single carriageway with a shared-use cycle track on its north side.
10.2 About half-way between the second development roundabout and the start of the residential development, the road widens to provide a pedestrian refuge to help people cross to a bus stop to the west of the refuge (for services towards the residential area). To the east of the refuge, there is a bus stop for services away from the residential development. The refuge does not appear to be particularly wide (as noted by WSCC in their response of 23/1/18). The eastbound bus stop will require passengers to board/alight from the shared-use cycle track and so the layout builds in potential conflict.

10.3 In line with the refuge, there is a path linking to the commercial development site, although there are no details shown on Drawing 2800G to explain if it would permit cycling.

10.4 To the west, the link road changes in nature to provide a street cross section of a carriageway, verges and footways. People cycling will be expected to do so on-carriageway. As people cycling from the east enter the residential area, they will need to cross from the shared-use cycle track into the westbound traffic direction. Joining the carriageway in this fashion will necessitate an awkward 90° turn to be able to see traffic from the east and the space to do so is constrained. People cycling east will simply transition from the carriageway to the shared-use cycle track relatively simply since the crossing point is much wider here, although transitioning from the carriageway parallel to a dropped kerb is a safety risk if the kerb is not completely flush with the carriageway.

10.5 At its western end, the new link road will connect to the existing street network on the eastern side of Lancing at Hayley Road which is a conventional layout comprising a carriageway with a footway on each side. Cycling will continue to be served by using the carriageway.

10.6 There is commentary provided in West Sussex County Council’s consultation response of 23/1/18 [22] that access to the new residential area will be from the west until the A27 connection is completed where by this will be closed to traffic other than walking, cycling and buses. Our view is that this is critical to ensure that the new road does not become a cut-through which will be detrimental to walking and cycling.

10.7 Our view is that a closure to general traffic would be far better placed at the second development roundabout which separates the residential and commercial elements
entirely and which may also act to “nudge” residents to choose non-car modes to access both the commercial development and country park. The link road here would then serve buses and emergency services.

10.8 Making Space for Cycling contends on p16 that on primary and secondary streets;

“People do not like cycling amongst traffic, or mixing with pedestrians. Therefore the primary requirement, which will give people the choice to be able to cycle, is to provide dedicated space for cycling on streets carrying most traffic. Infrastructure must be suitable for people cycling fast or slowly.”

10.9 The link road, as it approaches and passes through towards Hayley Road, probably changes from a primary to a secondary street, although for cycling, even the shared-use approach changes to one where cycling simply isn’t considered as a mode.

11.0 Country Park Linkages & Circulation

11.1 To the east of the residential development, a country park is proposed. In terms of NMU access and circulation this will be provided for by a path network which includes a number of structures to bridge the various watercourses.

11.2 The paths connect to the residential development at three points to its west, to the uncontrolled crossing point to the east of the second development roundabout and two points connecting to a small car park accessed from the link road which runs between the residential area and the second development roundabout.

11.3 The connections to the car park does not provide a way for people walking to either cross the link road or access the adjacent bus stop and for people cycling, the implication is that they would have to use the carriageway. Our view is that proper consideration of providing access to the highway walking and cycling facilities is vital to help ensure the country park is accessible to all.
11.4 Additionally, the links to the car park might encourage people to cycle or walk through it on a loop (being mainly for leisure) and so a bypass to the car park is required in our view.

11.5 The paths throughout the country park appear generally to be 2m in width and from the application drawings, it can be seen that all of the bridges are 2m in width. As discussed at length above, 3m would be the minimum acceptable width, plus a 0.5m clear buffer either side, so the bridges would need to be a minimum of 4m wide. In the WSCC consultation response of 30/5/18 [23], they state;

“Cycle routes within the country park
A number of ‘footpaths’ within the country park are suggested to be suitable for cycling. Whilst some are 4m wide and would provide sufficient space to accommodate shared use, a number of others are 2m wide. It is recommended that if these are to accommodate cyclists that these are widened to a minimum of 3m in width.”

11.6 The 2m footbridges are not wide enough for people cycling to pass each other because with 0.5m of useable sterilised by the parapets, the effective width is 1m. This is not a matter of people flows, but basic user space need and comfort. We consider the widths of the country park paths to be a critical design failure as they will have conflict built into them.

11.7 The proposed surface for the country park paths is self-binding gravel. As discussed earlier in terms of disabled cyclists, we do not consider this to be a suitable material in use. In operation, self-binding gravel is susceptible to weed growth and incursion, damage by flowing water under periods of heavy rainfall and degradation through use.

12.0 Design Review Summary

12.1 In this Non Motorised Users design review, we have provided evidence which supports BHFOE’s objections to the application in terms of how people walking, cycling and riding horses will be impacted by the scheme.
12.2 The loss of the crossing at the Sussex Pad Junction would be a significant impact on the local NMU networks which serve both leisure and utility trips and the alternatives proposed are narrow or circuitous. In many locations, there are critical design failures with reference to widths, headroom, gradients and 90° turns.

12.3 The proposals for Footpath 2049 and the link to Coombes Road north of the A27 contain a series of critical design failures for NMUs and provides a poor alternative to the more direct Sussex Pad Junction crossing.

12.4 The proposed A27 roundabout has poor NMU provision with multi-stage crossings and 90° turns. The layout is designed to maximise vehicle capacity alone and NMU provision is essentially provided in such a way as not to impact on traffic. There is a lack of information on the method of control which one would expect with an element which is part of the detailed areas under submission within the application.

12.5 The two development roundabouts are also designed to maximise traffic capacity and as such, NMU provision is incoherent, difficult to use and in some cases, with safety risks where people are expected to use uncontrolled crossings over multiple traffic lanes.

12.6 The residential element of the scheme hasn’t been developed with proper consideration of people cycling and so they are expected to join or leave the external shared-use cycle track with difficult and unintuitive layouts.

12.7 The majority of the country park path layout has not given any regard to the needs of NMUs who are required to use paths which are below any reasonable minimum widths.

12.8 The application proposals simply fail to place active travel and NMU provision at the heart of the design process. The development has been largely designed around the needs of motor traffic capacity and flow and so motoring is enabled by the design choices and NMUs are merely problems to be designed out.

12.9 The NMU provision falls short of minimum design standards and expert guidance in many places. Elsewhere, a minimum provision has been the adopted position and some of the additional requirements have not been considered - such as the additional 500mm
required with a vertical element above 600mm in the case of the Footpath 2049 proposals. In our view, the reliance of minimum standards and in some cases, their inappropriate application lends further weight to BHFOE’s objection.

12.10 In short, the failings for NMUs are significant throughout the scheme and therefore, this means that there are material grounds for a refusal of the planning application.

13.0 Alternative suggestions

13.1 Notwithstanding BHFOE’s overarching objection, this section provides some very high level comments on possible improvements to the NMU aspects of the application which the planning authority may wish the applicant to explore. Figure A, below gives an indication of what is possible;

Figure A - alternative suggestions.

13.2 The existing cycle routes show a significant gap in provision (for all NMUs), whereby the suggestions demonstrate how a basic network could be provided by the
proposed development which would provide links between Shoreham and Lancing and to cater for leisure and utility trips in the area alike.

13.3 The main principle is the NMU provision should be 4m if shared. Alternatively, there could be a stepped cycle track and footway arrangement for maximum user comfort and for use by equestrians, dedicated space should be provided with appropriate surface treatments.

13.4 For the Sussex Pad Junction, in a situation where the signalised pedestrian crossing is removed, the appropriate solution is for grade-separation with an underbridge for NMUs which is in accordance with the IAN195/16 and DMRB standards referenced within. As discussed in 6.5, headroom should be 3.7m and the 4m route should be carried through with a 0.5m buffer for cyclists. With a segregated or stepped arrangement, the buffer would only need to be on the cycling side. Ramps should be no steeper than 1 in 20, potentially with landings, or shallower without landings.

13.5 Photograph 4 shows an example of an underbridge which provides separate space for walking and cycling and recognises the need for a 0.5m buffer against the vertical element.
13.6 A route taken southwest from the Sussex Pad Junction would avoid the A27 roundabout and first development roundabout completely and toucans/ signals wouldn’t be required at the A27 at all. A spur could be provided north to reconnect with the existing A27 cycle track (south side) which itself is in need of an upgrade (width and surface); plus “missing links” at the Lancing Roundabout.

13.7 Continuing southwest, this route would bypass the second development roundabout and eventually a direct access to the school could be provided with a future spur to the A27.

13.8 Where people need to cross the new road link from the A27 roundabout to the residential area to access the commercial area, then those could be away from the roundabouts using a signalised crossing. If most of the route is shared-use, then either side of the crossing, the spurs would be segregated provision which would allow a parallel crossing which would have detectors for the cycle side and therefore the users of non-standard and adapted cycles would not need to use push buttons. Photograph 5 gives an example of a parallel crossing.
13.9 In all cases, the surface of the route should be machine-laid asphalt to provide a high quality riding surface, the geometry would favour gentle curves and easy corners where turns are required.

14.0 Conclusion

14.1 This NMU review has sought to demonstrate that the NMU provision for the application is of poor quality and does not place active travel at the centre of design objectives. Standards and expert guidance has been reviewed and applied appropriate in support of the comments provided.

14.2 It shows that minimum standards and below minimum is the design norm for NMUs within the application and that they are seen as problem to be dealt with rather than core to the design approach.
14.3 This review also demonstrates that at-grade crossings for NMUs can be inconvenient and introduce delay for NMUs and general traffic. A grade separated crossing at the Sussex Pad which is designed to a highly accessible standard would be beneficial for NMUs and drivers alike.

14.4 Alternative suggestions have been provided which would provide a superior level of service, connectivity and inclusivity for NMUs using the proposed development. There is an excellent opportunity to provide high quality infrastructure for NMUs which will enable mode share to be shifted to active travel for both the development and the existing population.

14.5 Figure B summarises a wider range of issues in and around the development.
Figure B – A wider range of issues

- Effective 2m path width is dangerously narrow – should be 4m path with 0.5m clearance either side
- Grade separated crossing required
- 4-stage crossing of A27 roundabout likely to cause delays and not suitable for equestrians
- A 4m cycle route south of the access road would avoid the bus stop and numerous road crossings
- Country Park paths are only 2m wide while effective bridge widths are only 1m – not suitable for cycling
- Sub-standard width into housing estate
- Connection onto High St needs improving
- Connection to RCR 79 needs improving
- Proposed Bridleway
- Existing Bridleway
- Existing sub-standard cycle route
- Direct access to school
- Faster route avoiding school
- Fill in missing cycle links
- Existing Controlled Crossing
- Existing Footpath
- Existing National Route
- Existing Regional Cycle Route
- Existing PFI (Bridleway)
- Existing PFI (Footway)
- Existing PFI (Restricted Byway)
- New Country Park Path
- New Off Carriageway Path/Cycle Route
- New Upgraded Cycle Route
- Existing Footpath and Cycle Routes
- New Residential Road Network (suitable for cycling)

Sir Robert Woodard Academy
A27
Lancing
North Lancing
South Lancing
Lancing Hill
Gardiner Hill
Gardiner Road
Fairfield Road
Woodlands Road
Woodward Road
North Lancing
Existing Path
Shoreham
B."
15.0 References

[7] Bricycles Objection
[8] British Horse Society Objection
[9] Lancing College Objection
[10] Drawing 2800G
[12] Drawing 2402B
[13] SDNP/18/00434/FUL
[14] BHFOE Objection to SDNP/18/00434/FUL
[16] Vectos Response to Objections note, May 2018
[17] TD36/93 DMRB Subways for Pedestrians and Pedal Cyclists Layout and Dimensions, DfT, 1993
[18] Drawing HED-1172-LA-604-00
[19] Environment Agency response to SDNP/18/00434/FUL
[21] Local Transport Note 2/95, DfT, 1995
[22]WSCC consultation response 23/1/18
[23] WSCC consultation response 30/5/18