

Technical Note

Project: Chichester town centre: cycle review of proposals

Subject: Alternative Approach

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Code:	02515	Author:	LM
Date:	3 December 2016	Approved:	AL

I Introduction

- 1.1 **Commission:** Phil Jones Associates (PJA) have been approached by Councillors from Chichester South to provide expert advice regarding the proposals in Chichester which have recently been the subject of public consultation.
- 1.2 **Phil Jones Associates:** PJA is a major contributor of planning and design ideas in the field of walking and cycling in the UK. The practice provides a comprehensive range of walking and cycling-related services to both public and private sector organisations. PJA has a team made up of individuals with in-depth knowledge of walking and cycling planning, modelling, design, research and innovation. PJA is the originator of national guidance for local walking and cycling infrastructure plans known as the 'National Cycling and Walking Infrastructure Plan, July 2016' (NCWIP), commissioned by the Department for Transport setting out the recommended processes and outputs for developing a pipeline of cycling and walking improvement schemes. This means the practice is well-positioned to provide guidance to local authorities on how to develop their cycling infrastructure.
- 1.3 PJA has drafted this technical note with suggested amendments to improve conditions for cyclists (and pedestrians) for the following plans:
- The proposed Westgate/Orchard St signalised junction Option 4
 - Westgate improvement scheme
 - Westgate/Sherborne Rd mini-roundabout improvement
 - Sherborne Rd proposed traffic calming
 - St. Pauls Rd right-hand turn lane
 - Brandy Hole Lane point closure
- 1.4 **Basis of Advice:** The comments found on the following pages take into account national and local good practice design guidance (Manual for Streets 2, London Cycling Design Standards, Local Transport Note 2-08) and adherence with local policies. PJA has recently worked with DfT to provide network planning guidance for the forthcoming Cycling and Walking Investment Strategy, and new cycling design guidance for the Highways England Design Manual for Roads and Bridges (IAN195/16 Cycle Traffic and the Strategic Road Network).
- 1.5 The advice considers the local vision articulated in the 'Chichester District Council Infrastructure Business Plan 2016/2021' and 'The Chichester Local Plan: Key Policies 2014-2029' which supports "a socially responsible and more environmentally friendly way of life" where people "live in sustainable neighbourhoods supported by necessary infrastructure. . . feel safe and secure. . . and move around safely and conveniently with opportunities to choose alternatives to car travel."

2 Overview

General approach

- 2.1 There is huge suppressed demand for cycling in the UK among adults and children. Around half of children say they would like to cycle to school, yet nationally only 2% do so. Women are more likely than men to be fearful of traffic¹, but fear of being hit by a motor vehicle remains the biggest deterrent to cycling among all groups. Those cycling tend to be over represented in casualties compared to other modes in the UK². The main deterrent to cycling in the UK is fear of being involved in a collision with a motor vehicle, so the separation of motorists from cyclists is an effective way to increase cycling. However, segregation only serves to make cycling an attractive prospect if those cycling are generally given priority over side road junctions, so that delays for cyclists are no longer than delays for motorists.
- 2.2 **Segregated tracks:** Segregation from busy or fast moving traffic is a prerequisite before children, women, older people and the general population is willing to cycle for regular journeys to shops, services, work and education. Segregation can be achieved in the form of stepped cycle tracks, cycle tracks separated by raised kerbs or light segregation with bolt-down armadillos, thin flexible wands/bollards or kerbs. Such facilities are usually welcomed by the public because they mean motorists, pedestrians and cyclists each have their own space.



Figure 1: Segregated, stepped cycle track with side road cycle priority. A3060, Bournemouth

¹ Pooley, C., Tigh, M., Jones, T., Horton, D., Scheldeman, G., Jopson, A., Mullen, C., Chisholm, A., Strano, E. and Constantine, S., 2011. *Understanding walking and cycling: Summary of key findings and recommendations*.

² "Taking into account distance travelled, there are about 50 times more child cyclist deaths (0.55 deaths/10 million passenger miles; 0.32 to 0.89) and nearly 30 times more child pedestrian deaths (0.27 deaths; 0.20 to 0.35) than there are deaths to child car occupants (0.01 deaths; 0.007 to 0.014)."

Sonkin, B., Edwards, P., Roberts, I. and Green, J., 2006. Walking, cycling and transport safety: an analysis of child road deaths. *Journal of the Royal Society of Medicine*, 99(8), pp.402-405



Figure 2: Segregated, stepped cycle track, A35, Bournemouth



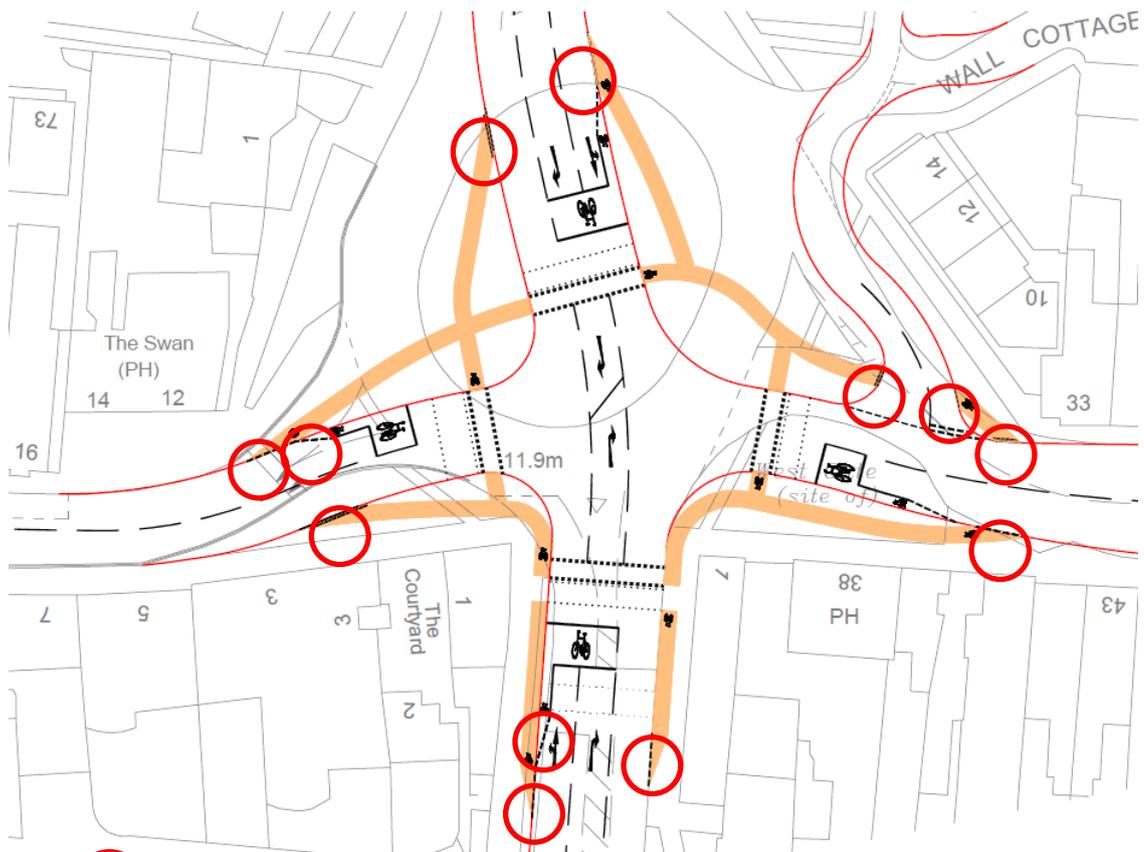
Figure 3: Segregated, stepped cycle track, Old Shoreham Rd, Brighton

2.3

Side roads, crossings and roundabouts: Where walking and cycling routes intersect with motor traffic, pedestrians and cyclists need to be given some form of protected crossing. This crossing can take the form of parallel crossings, zebra crossings, or signalised junctions — crossings which can be used by vulnerable road users including those on mobility scooters and children travelling independently. At side roads, continuous footways, entry treatments and give-way markings can help ensure pedestrians are given assistance to cross. (See Figures 14, 15 & 16 for images of continuous footways). At roundabouts, parallel crossings (see Figure 4) and a more compact geometry to reduce vehicle entry and exit speeds may need to be considered as a way to improve safety for pedestrians and cyclists. Junctions that require drivers to slow and negotiate with others (including other drivers) can have safety and place-making benefits.



Figure 4: Parallel crossing, Hackney, London



KEY:  = Potential conflict point as cyclist is directed onto or off carriageway

Figure 5: Proposed plan of Westgate/Orchard Street signalled junction. Potential conflicts point highlighted. Source: Extract from Vectos plan

Issues

- 3.1 The layout currently proposed creates some cycle traffic movements through the junction which could result in potential conflict points with motor vehicles or pedestrians (see Figure 5).
- 3.2 Two-sets of cycling infrastructure are proposed at this junction: One set is on-road, the other is off-road. This is intended to provide an on-road facility for more confident cyclists and an off-road amenity for more nervous or vulnerable cyclists such as children. However, both the on and off road amenities proposed present problems to those two different user groups.
- 3.3 The off-road facility takes people away from the direct, desire lines across the junction (heading north-south, east-west). Every time a cycle route leaves or re-joins the carriageway, a potential conflict with motor vehicles is created, and the cyclists are routed through areas where pedestrians are approaching and waiting to cross the road. Cyclists using the cycle tracks will incur additional delays at the traffic signals compared to those who remain on-carriageway. Figure 5 illustrates the potential conflict points where someone cycling must negotiate leaving

or re-joining a carriageway. These potential conflict points could be redesigned to reduce risk by using protective buildouts where cyclists re-join the carriageway – see Figure 6 below.

Protective buildouts



Figure 6: Protective build-out, Bournemouth.

- 3.4 Anyone cycling on the off-road facility is also obliged to give way at the signalised side-road (to Wall Cottage Drive). This makes it less convenient and creates a potentially injurious conflict point with motorists entering or exiting the side-road, especially as they would not anticipate stopping so close to a signalled junction. Side road junctions are particularly difficult to negotiate for children travelling independently since they are less well able to judge vehicle speeds and may be less able to communicate with the adults driving. A continuous footway and cycle track is suggested below to overcome this issue.
- 3.5 The proposed on-road painted facility has short feeder lanes and Advanced Stop Lines (ASLs). No lane is marked across the junction. The presence of two lanes for vehicular traffic poses a problem requiring those cycling to switch lanes, and negotiate traffic going ahead if they wish to turn right. number of cycle deaths involving HGV traffic have occurred where the cyclist has been positioned in a left-hand feeder lane to the left of vehicles, and has consequently been crushed by the left turning vehicle.

Two Alternative Suggested Layouts:

Sketch idea 1: Radical redesign – Danish style junction for Westgate/Orchard St

- 3.6 We suggest a single cycle facility could be constructed which meets the needs of all cyclists: young and old, beginner or experienced. This is in line with both national and international best practice.³
- 3.7 Our proposal would simplify what is quite a complicated design that many users would struggle to understand. A single set of high quality cycle infrastructure might also be cheaper to construct and maintain. Our proposal would liberate more of the public space surrounding the intersection which could be landscaped to improve the urban environment.



Figure 7: Sketch idea 1, Westgate junction – schematic sketch in principle only. We do not have traffic flow and modelling information to provide a detailed alternative proposal.

- 3.8 Most towns and cities in the UK are only just beginning to engineer seriously for cyclists. This makes it all the more important that the cycling infrastructure which is built is easily understood, safe and simple to use. The sketch in Figure 7, illustrates a junction formation type which is worth considering at this and/or other locations in the future. Clearly it would need to be subject to junction modelling and all the other traffic flow information which we do not have access to would need to be considered.
- 3.9 We suggest that a single high grade segregated cycle facility is provided on each side of each road. This could be a stepped cycle track (or cycle track segregated via raised kerb) which merges with road level only at last moment, just before the cyclist meets the junction to traverse it, thereby reducing (in both time and space) the risk of exposure to traffic injury. Where the cycle

³ 'International Cycling Infrastructure Best Practice' co-authored by Phil Jones Associates in 2014 and commissioned by Transport for London

facility is not segregated as it crosses the junction, a painted lane can be marked to indicate the straight-ahead movement for cyclists. A two-stage right turn should also be considered.

- 3.10 The crossings for pedestrians and cyclists can be brought right up to the junction. Tightening the geometry will also serve to reduce speeds and therefore improve safety and the attractiveness of this important junction.
- 3.11 To further reduce the risk of injury and delay to other traffic, a pre-green, head start can be given to cyclists to enable them to set off a few seconds in advance of other vehicles so that turning traffic isn't in conflict with cyclists going ahead.
- 3.12 'Two Stage Right Turn: At many of the re-engineered junctions in London with separate cycle signals and tracks (including 'hold the left' junctions) a 'two stage turn' has been used which enables cyclists to turn right from the left-hand side of the carriageway, so they don't have to cross into the moving traffic lane. Cyclists firstly move off when shown a cycle green, but then come to a stop in the junction mouth opposite the road they wish to turn into. They wait there until the signals change and they (and the traffic behind them) receive a green and move off ahead to complete the turn. The second stage of the turn is also assisted by an early release for cycles. We recommend the same arrangement is used here to ensure cyclists are safe.



Figure 8: Nearside waiting area for two-stage right turn, Cycle Superhighway 2, London

- 3.13 In the Vectos proposals the on-road painted lanes and off-road cycle ways do not connect to cycle facilities beyond the junction in question. It is worth considering how the facilities could link to future cycle facilities on the roads approaching this junction. A single set of stepped cycle tracks on each side of the road could potentially, be extended along each of the approaching roads.

Sketch idea 2: Minor alterations to proposed junction for Westgate/Orchard St

- 3.14 This section outlines a less radical redesign with some minor design amendments. Avenue de Chartres and Orchard Street form part of the Chichester Ring Road and as such relatively heavy volumes of motor vehicle are to be expected. Therefore, arguably, these roads are unlikely to be attractive environments in which to cycle without further infrastructure improvements along each link as well as at the junction.
- 3.15 To address the most useful north-south movement for cycle traffic, it is noted that Avenue de Chartres has a shared cycleway footway on its west side, albeit of intermittent quality with one section where those cycling are required to dismount. With minimal work, the path west of Avenue Chartres – which continues to the station, Westgate Leisure Centre and other important trip attractors – could form a key part of a Chichester cycling network if access to this route were more convenient and clearly demarcated. Therefore, the junction layout should facilitate cycle traffic wanting to access the cycleway on the west side of Avenue de Chartres.

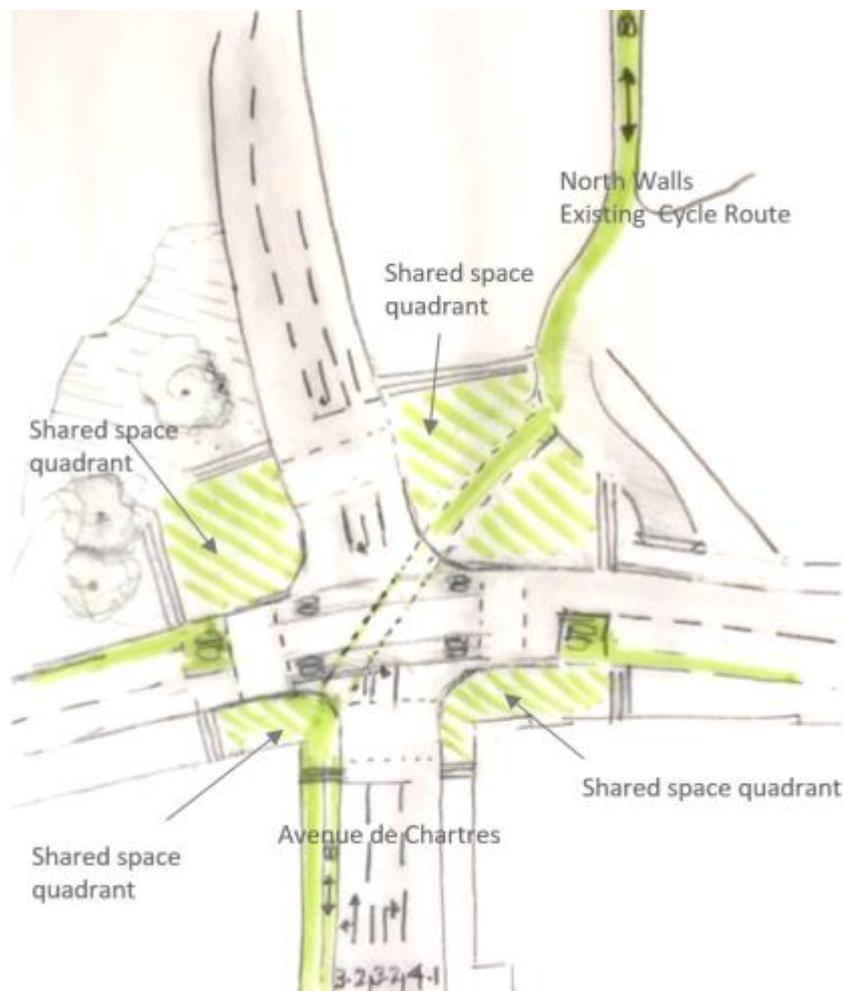


Figure 9: Sketch idea 2, Westgate/Orchard St junction – linking existing cycle route

- 3.16 The current division of space south of the junction could be altered to allow a two-way track on the south-west of the junction. Traffic lanes on the approach to the junction are wider than the 3.2m standard lane width set out in Manual for Streets. By reducing proposed queuing lane

widths to 3.2m, a better environment for pedestrians and cycle traffic can be achieved without loss to motor traffic capacity.

- 3.17 The dismount section of Avenue de Chartres, south of the junction, could be removed by altering the configuration of the bus stop by making use of the space available mid-carriageway which is currently hatched out adjacent to a central reservation. The traffic lane can be moved over to fill this currently unused space, and the bus stop built out to create a wider footway around the bus stop. This may be sufficient to provide a separate cross-section for cycle traffic – as opposed to shared use at present either side of the bus stop – a configuration that has been successfully in place in Brighton since 2013, and known as a ‘bus stop bypass’ or ‘floating bus stop’.
- 3.18 In the other direction along the north-south axis through the junction, the city walls provide an alternative orbital route for cycle traffic parallel to Orchard Street, both at ground level (officially) and informally at the elevated level. Therefore, it is recommended that the signalised junction facilitates diagonal movement for cycle traffic between Avenue de Chartres (west side) and Wall Cottage Gardens. This can be in the form of a diagonal cycle crossing stage during the all-red pedestrian phase. A short cycle link from Wall Cottage Gardens can make the presence of this route clear. The quadrants of the junction would act as shared use as cycle traffic would be moving slowly at this node point.
- 3.19 For west-east movement, taking cycle traffic off the carriageway and then back on again results again in additional conflict with motor traffic and pedestrians. Cycle traffic also loses priority over side road traffic at Wall Cottage Gardens, and cycle traffic will have already had to wait for a full cycle of the junction in order to make use of the all-red phase. However, cyclists remaining in the carriageway benefit from the same amount of green time as motor traffic, plus they retain priority at Wall Cottage Gardens. It is therefore recommended that the off-carriageway cycle lanes are removed and replaced with advisory cycle lane markings through the junction.
- 3.20 These should be located away from the nearside of the mixed traffic lane – i.e. at least 1m from the kerb – to avoid cycle traffic being led into the nearside “left hook conflict” location, where risk of collision with turning vehicles is greater. With the quadrants of the junction available as shared use (for pedestrians and cyclists), dropped kerbs should be provided to facilitate access to these areas so that cyclists wishing to pass through the junction without traffic moving can do so during the pedestrian stage. This would also facilitate right-turning movements for cycle traffic.
- 3.21 The footway should also be continued across the mouth of Wall Cottage Gardens to indicate pedestrian priority. The tightening of the junction should be investigated in order to shorten pedestrian and cycle crossing distances. This may have the benefit of reducing inter-green times and thus improving junction capacity. Tightened junctions also lead to fewer and less serious casualties because they oblige drivers to undertake turns at lower speeds, which means road users have more time to see each other and react accordingly.

Westgate Improvement Scheme

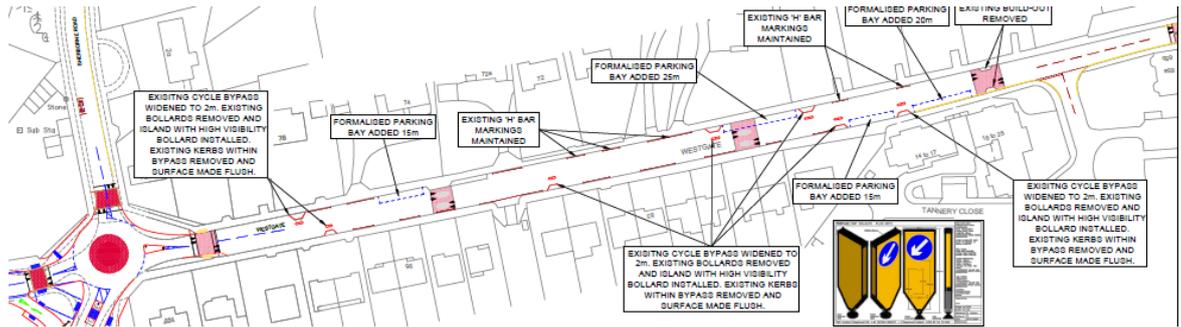


Figure 10: Proposals for Westgate. Source: Extract from Vectos Plans

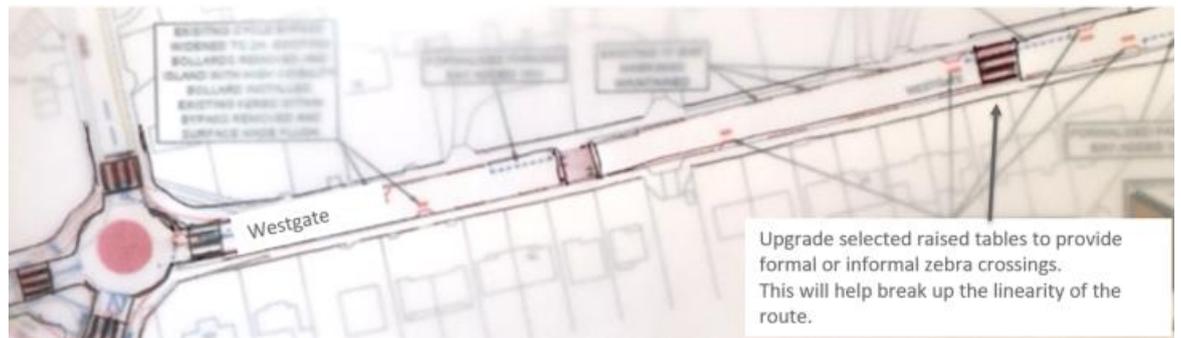


Figure 11: Westgate, improving the walking environment with zebra markings - sketch idea

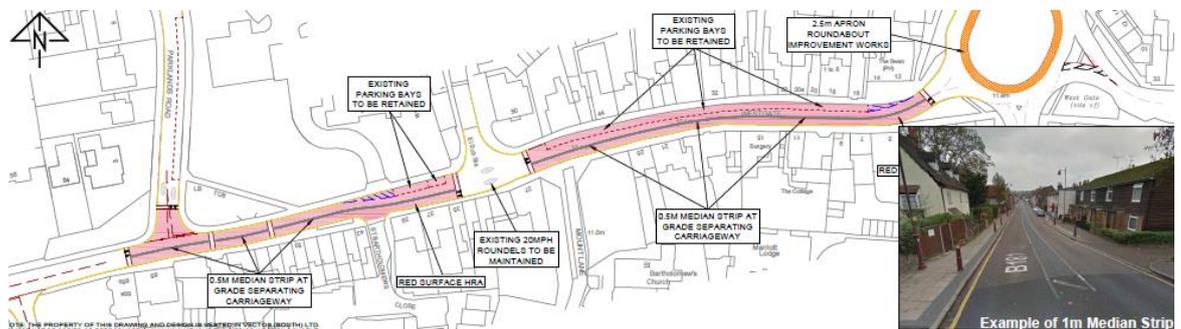


Figure 12: Proposals for Westgate. Source: Extract from Vectos Plans



Figure 13: Westgate: improving walking environment with zebra markings - sketch idea

- 4.1 It should be noted that the roundabout proposal shown at Sherborne Road on the “Westgate Improvement Scheme” is different to the roundabout proposal in the specific drawing for the Sherborne Road / Westgate Road roundabout. This assessment has assumed that the latter is the preferred option, and comments and recommendations are set out in the specific section below.
- 4.2 Westgate is divided into two distinct character sections: We present recommendations consistent with the respective typologies. In the eastern section, Westgate currently benefits from being relatively uncluttered with no centre line, few paint markings, minimal highways engineering clutter – all factors which help keep the space simple and legible.
- 4.3 It is unclear what benefit the median strip and surface overlay would provide. The proposed surface overlay and median strip appears to be detrimental to the historic character of the street. A median strip also introduces a visual demarcation between opposing traffic flows, and TfL research has found that the absence of median demarcation reduces vehicle speeds⁴ (so the median strip could potentially lead to increased speeds). It should be noted that new, smooth road surfaces generally result in higher traffic speeds. Also, the width of the median strip – 0.5m – provides little benefit to pedestrians if the intention is to allow two-stage crossing movements. If the idea is that the median strip will assist with crossing, and that there is a desire to cross the road in places (which inevitably there will be) it is better to provide crossing points where motorists are obliged to stop and give-way, by using zebra crossings or indicative zebras.
- 4.4 In both sections of Westgate, we recommend that some of the raised table traffic calming features are upgraded to pedestrian crossings: either with formal zebra crossing markings or with contrasting materials (see Figure 22) that encourage drivers to cede to pedestrians wanting to cross (and are therefore more beneficial to pedestrians than a raised table alone).
- 4.5 The hatching around the parking bays is a further visual intrusion into this attractive street. A more sensitive approach might be to use ground-mounted planters, with suitable reflectors, to act as ‘bookends’ for the parking bays. These are more effective than hatching as they are in situ at all times, whereas when the parking is not occupied, motorists can easily encroach into the hatching removing its effectiveness.
- 4.6 The side roads along Westgate do not have a consistent treatment. Mount Lane has a continuous footway across the mouth of the junction with Westgate giving visual priority to pedestrians (see Figure 14). However, adjacent junction mouths are wider, which can be difficult for vulnerable pedestrians to use. It is recommended that the continuous footway treatment at Mount Lane is replicated at the other side road junctions off Westgate to provide a consistent environment with a better level of service for pedestrians. Continuous footways slow vehicles

⁴ ‘Centre Line Removal Trial’, Transport for London 2014.
[Internet] <http://content.tfl.gov.uk/centre-line-removal-trial.pdf>

turning into or out of side roads, reducing speeds so collisions with pedestrians, cyclists and other motorists are less likely and less serious if they do occur. See Figures 15 and 16 for examples of continuous footways. Their inclusion on all side roads along Westgate would be in keeping with the existing.



Figure 14: Existing continuous footway across Mount Lane, Westgate, Chichester



Figure 15: Continuous footway, Clapham, London



Figure 16: Continuous footway, Clapham, London

5 Westgate/Sherborne Road Mini-Roundabout Improvement Scheme

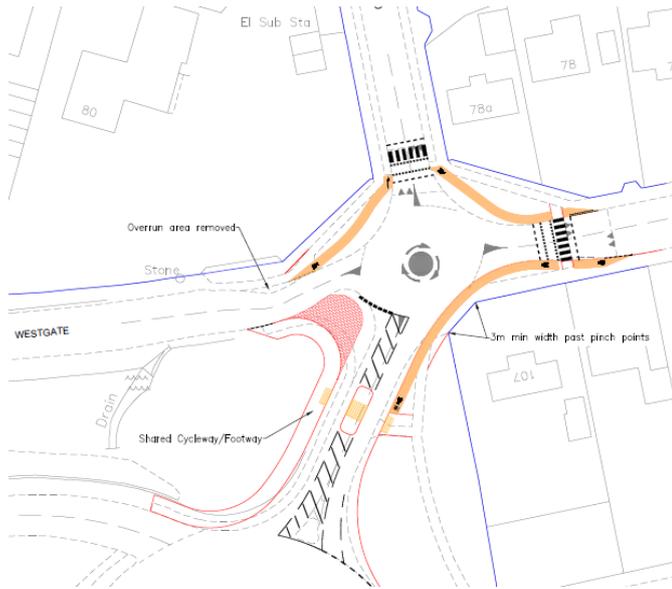


Figure 17: Proposals for Westgate/Sherborne mini roundabout. Source: Extract from Vectos Plans

- 5.1 Three options are suggested below: one with minor changes, the second with an additional parallel crossing to the south, and a third with a parallel crossing on each of the four arms of the roundabout.
- 5.2 It should be noted that the design above differs from the treatment shown in the proposed Westgate improvement scheme drawings. The commentary below relates to the above proposals only. However, we will make passing reference to the other layout where relevant, and this will be clearly stated.
- 5.3 The existing layout is hampered by the overrun area required for buses to turn left into the stub-end section of Westgate, and it is acknowledged that this is a detriment to pedestrians because it widens the space they have to cross. It is unclear why the proposed left-slip lane has been abandoned from the proposals (as shown in the Westgate scheme drawings) since the inclusion of the left-slip lane would allow a tighter geometry and pedestrian/cycle crossing to be more easily integrated to the south of the roundabout.
- 5.4 Widening the road to the south of the roundabout opens up the road and separates the traffic – both features which are shown to increase driving speeds and are likely to make the roundabout and the road less conducive to walking and cycling.
- 5.5 The proposed cycle lanes are useful for left-turning movements, but all other movements at the junction are made more problematic with this arrangement. Some cycle traffic may remain on carriageway to turn right or carry on ahead, and motorists may incorrectly perceive that a cyclist is wrong to stay on the carriageway: this may lead to aggressive or bullying behaviour.
- 5.6 A more legible approach would be for the cycle facilities to operate two-way around the junction so turning movements can avoid the roundabout completely. Because of constrained spaced, it

is recommended the south-eastern quadrant of the junction is shared use, consistent with the greenway that connects to the south. The alignment of the paths can also be amended to avoid cycle traffic being required to make a sharp 90-degree turns. Finally, the path on the south-west quadrant of the junction should connect directly between the two crossing points, rather than following the long way around parallel to the kerb. This will improve visibility as pedestrians and cyclists will arrive at the crossing point largely perpendicular to the kerb, rather than having traffic approach the conflict point from behind them.

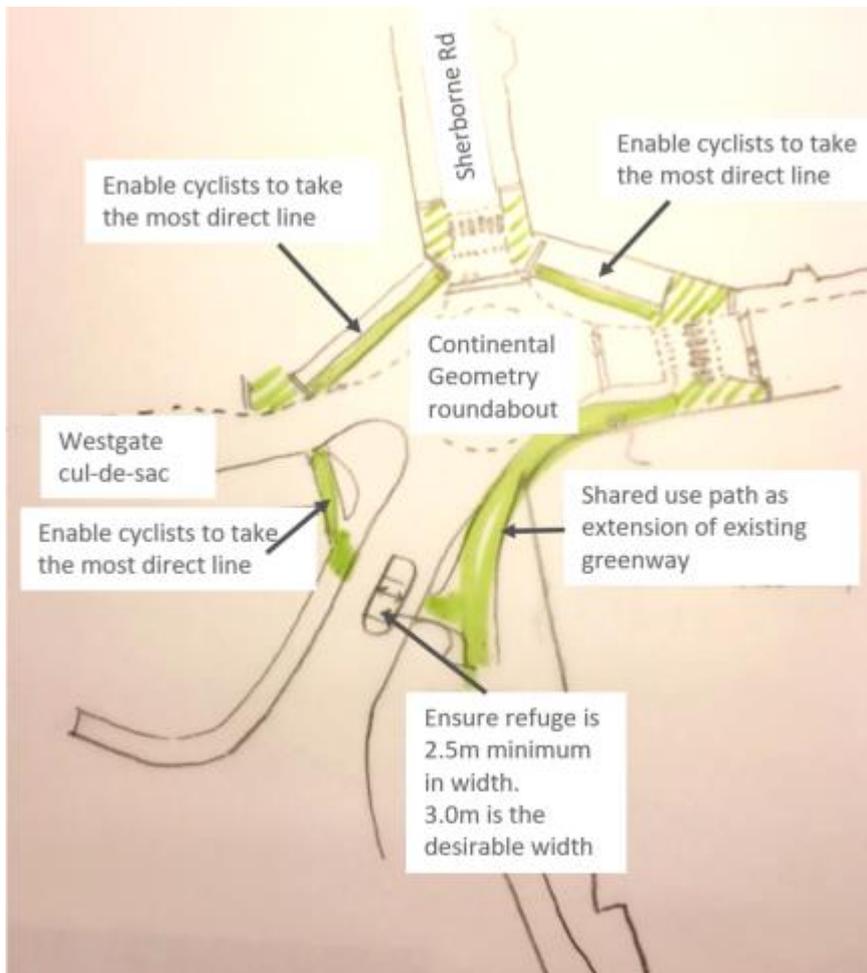


Figure 18: Sketch idea 1: Minor alterations to align the cycle route

- 5.7 A third parallel crossing should be considered for the arm to the south of the roundabout. A gateway feature could be introduced at the splitter island on the exit from the large roundabout to the south, then motorists can be fore-warned that they are entering a lower speed environment (if the road is not widened).

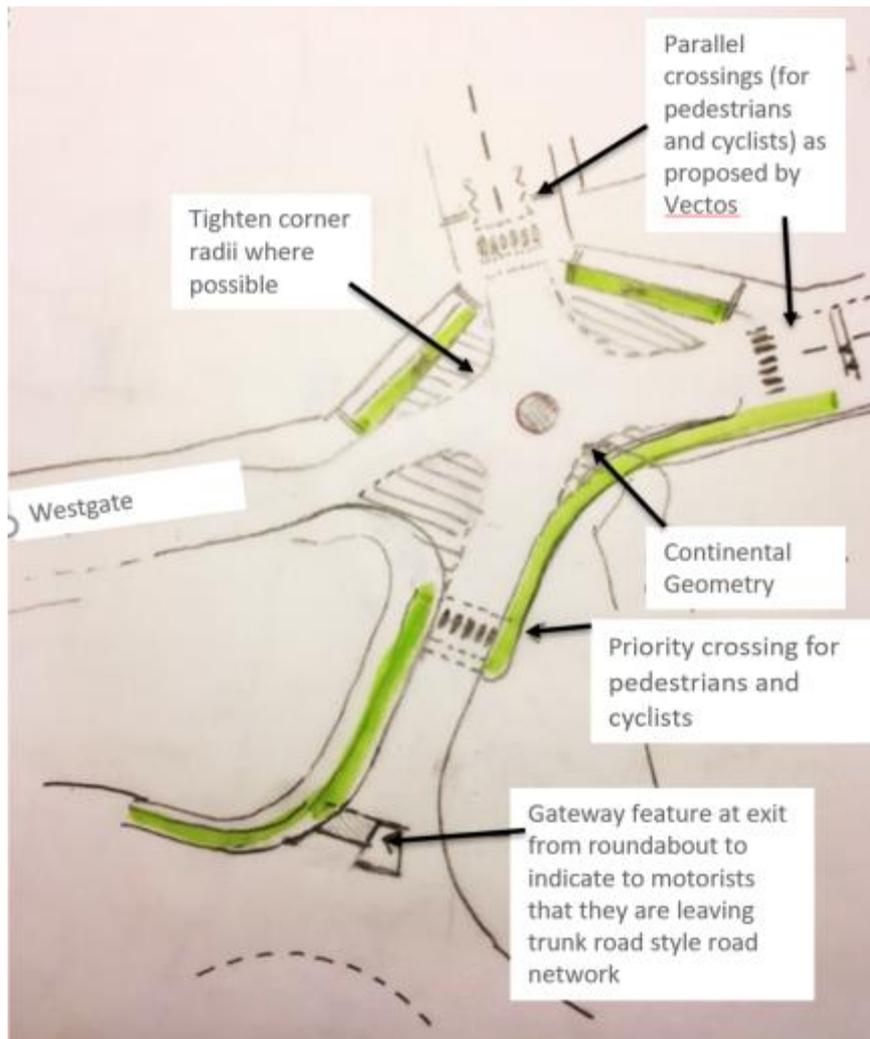


Figure 19: Sketch idea 2: three parallel crossings plus gateway feature

- 5.8 The Vectos plans include three different crossing types within a single roundabout site (Sherborne/Westgate). The roundabout design could be simplified by creating parallel crossings on each of the four arms of the roundabout rather than different crossing types on each arm. See the Cambridge roundabout proposal (Figure: 21) by way of example. Motorists are not obliged to give way to people crossing at pedestrian refuges or splitter islands, so crossings would also improve accessibility particularly for vulnerable road users such as older people who benefit from the legal priority provided by a zebra crossing.
- 5.9 Creating a compact continental geometry would reduce speeds and casualties. Principles include removing splitter islands or using pellet shaped splitter islands (rather than flared islands) to slow turning movements, removing central hatching, tightening flares and the circulatory lane.
- 5.10 Further, segregated cycle facilities on the approach to each parallel crossing would provide a facility which can be used by all ages.

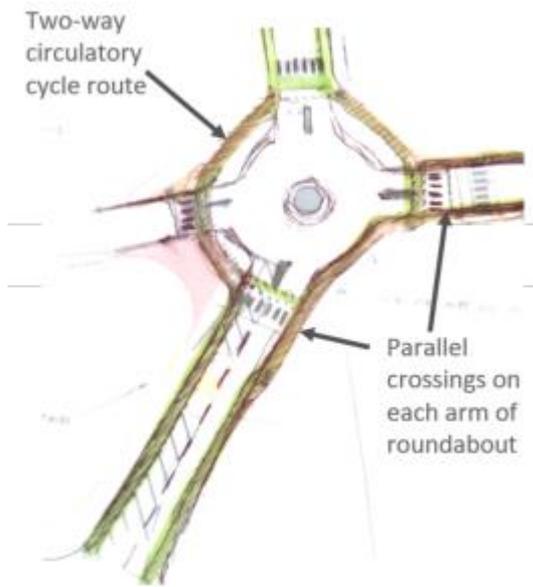


Figure 20: Sketch idea 3: continental geometry with parallel crossings. We do not have traffic flow and modelling information or survey to provide a detailed alternative proposal.



Figure 21: Cambridge ring road cycle roundabout proposal

6 Sherborne Road Proposed Traffic Calming

- 6.1 Identify where people might want to cross along Sherborne Road. Raised tables can be replaced with zebra crossings or raised table zebras to ensure vulnerable road users can cross safely (with legal priority if required). The introduction of zebra crossings along this route will also break down the linearity of long street.



Figure 22: Indicative zebra crossing, Bexley Heath

7 St. Paul's Road Right Hand Turn Lane

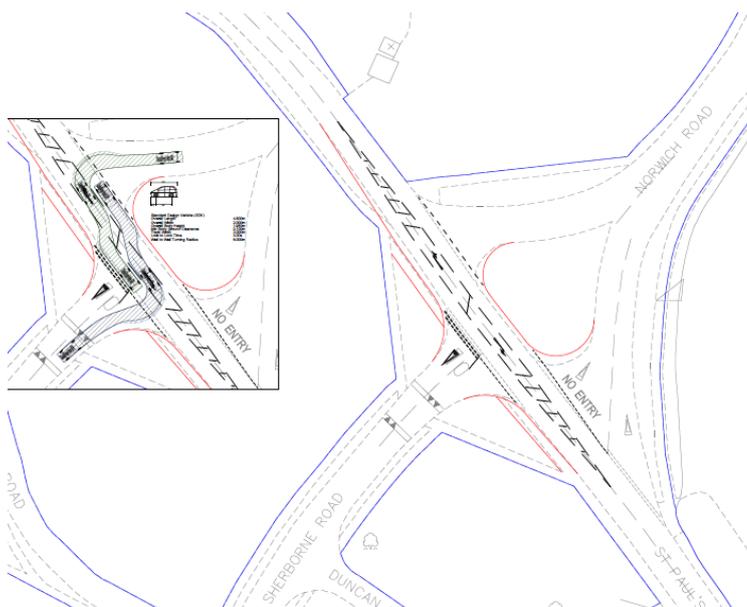


Figure 23: St. Paul's Road Right Hand Turn Lane. Source: Extract from Vectos plans

- 7.1 The four-arm junction of St Paul’s Road, Sherborne Road and Norwich Road is an unusual layout. It appears that right-turn pockets have been proposed to accommodate additional volumes of traffic travelling from the new development (to the north) towards the A27 via Sherborne Road.
- 7.2 There are no desire-line crossings provided for pedestrians, and cycle traffic carrying out a crossing manoeuvre or right-turn will find itself in a vulnerable position, both with the current layout and in the proposal.
- 7.3 The generous curvature of the Norwich Road junction will encourage fast turning manoeuvres, which can lead to elevated collision risk for cycle traffic.
- 7.4 All these issues can be addressed by reducing the entry and exit geometry on Norwich Road and using the space gained to provide pedestrian crossings. These can be tied in with widened footways to accommodate a short section of shared use, as a feeder link for cycle traffic. A left-turn by-pass slip can be provided for cycle traffic exiting Norwich Road.
- 7.5 The proposed footway adjacent to St Paul’s Road leads pedestrians to a very uncomfortable crossing point where traffic is turning in to the side road from behind them. The existing raised table a short way into Sherborne Road is recommended as a much more natural and comfortable crossing point, and as such the layout of pedestrian infrastructure should reflect this.
- 7.6 All crossing points – existing and suggested – could take the form of parallel pedestrian-cycle Zebra crossings, to provide vulnerable pedestrian and cycle traffic with legal priority. These may also act as a useful gateway feature for southbound traffic as it enters the urban area.

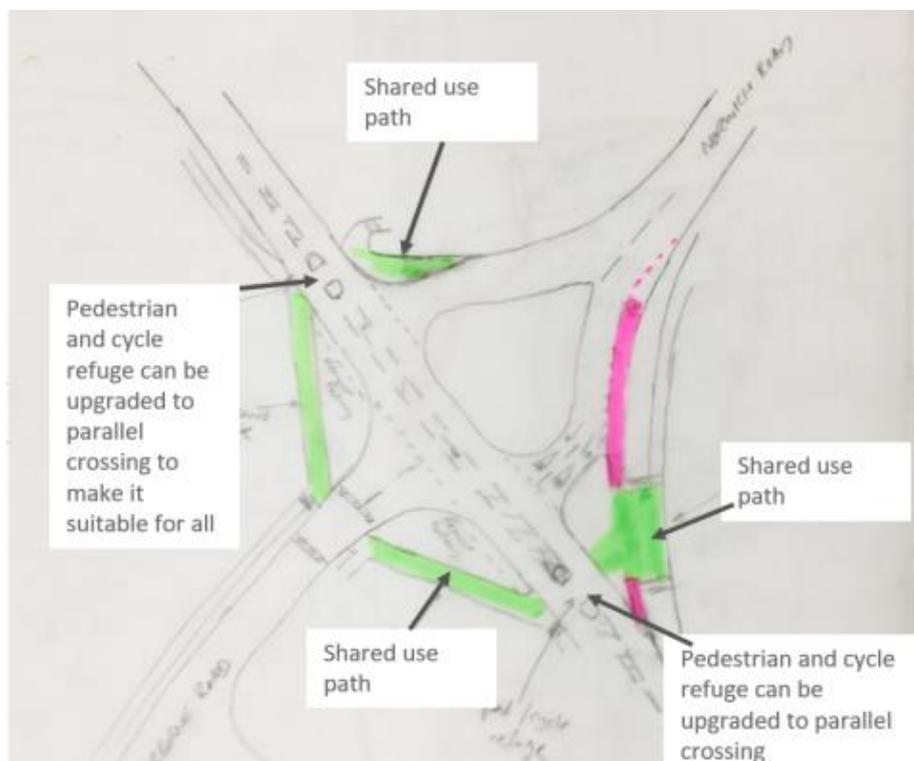


Figure 24: St. Paul’s Road Right Hand Turn Lane – sketch idea

8 Brandy Hole Lane – point closure

- 8.1 A point closure is proposed on Brandy Hole Lane. This will be beneficial for pedestrians and cycle traffic as it will dramatically reduce the volume of through traffic on this road. It is understood that the plan shown is only indicative, however it should be borne in mind that appropriate spacing of bollards or other closure materials (to 1.5m gap with a straight approach, see IAN 195/16, Highways England) would be required to ensure adequate access by wheelchair users and cycle traffic.

9 Conclusions

- 9.1 The current cycling network in Chichester is not yet comprehensive so designing a coherent package of new infrastructure is not an easy task. We also appreciate that the Highway Authority can only consider the proposals put before them, and there is limited scope in the planning system to push for wider measures if it cannot be backed up by a pre-existing adopted plan or strategy.

- 9.2 Our recommendations are therefore two-fold:

- A full NMU audit is undertaken on all infrastructure proposals, following the technical advice of IAN 195 / 16 and the “Cycle Level of Service” methodology set out in TfL’s London Cycle Design Standards. This will help to ensure that the proposals put forward are as good as they can be for cycling, within the limits of each scheme.

Develop a local cycling and walking infrastructure plan (LCWIP) for Chichester to identify a strategic cycling and walking network. Over the longer term this would ensure that any new opportunities for cycle infrastructure that emerge from new development or other funding are placed in the context of a wider network plan. The Department for Transport is due to publish its LCWIP process guidance in spring 2017.