Greater Manchester Interim Active Travel Design Guide

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GMCA GREATER MANCHESTER COMBINED AUTHORITY

Transport for Greater Manchester

Context and purpose of this guide

1. When the Bee Network was conceived in 2017, a key part of the concept of the network was a promise of design quality: that if a route was branded as part of the Bee Network the user could be confident that the route would be appropriate for use by an unaccompanied competent 12 year old cyclist, or by a parent pushing a double buggy. This was first articulated by the Greater Manchester Cycling and Walking Commissioner, Chris Boardman, in his 2017 publication *Made to Move.*
2. When Greater Manchester's *Cycling and Walking Infrastructure Proposal* was launched in summer 2018, it committed to the following design principles:
    1. Streets should be places where people choose to spend time socialising rather than just save time passing through
    2. Street design should focus on moving people rather than traffic
    3. Dedicated separate space should be provided for walking and for cycle traffic
    4. People should feel safe, relaxed and secure on the street and not just in a car
    5. People should feel like they can stroll without delay and linger without issue
    6. Protection and priority should be given to people cycling and walking at junctions
    7. Health benefits should be highlighted and quantified for all street improvements.
    8. Walking, cycling and public transport should go hand in hand
3. These principles were intended to inspire designers with new ideas about how to approach street design so that the focus could be placed on those that walk and ride rather than simply those who drive.
4. This has since been reinforced by the adoption of the Greater Manchester Streets for All Design Check (SADC), an evolution of Transport for London's Healthy Streets Check, in Greater Manchester's Walking and Cycling Investment Plan, *Change a Region to Change a Nation*, in 2020. The SADC introduces a series of metrics themed around the seven adopted Network Principles from the GM 2040 Strategy on which design proposals can be scored. The check ultimately provides a method of visually quantifying the uplift in street design quality that is afforded by a design solution. More importantly, the SADC provides a designer's checklist of 'things to think about' when designing streets.
5. The SADC includes fifteen 'critical issues' for cycling and walking safety, which are the key subjects of examination through Cycling and Walking Design Review Panel. However, whilst the SADC is a useful tool for designers, it does not give design ideas or 'answers'. For that, full design guidance is required.
6. Work is underway on producing a Streets for All Design Guide for Greater Manchester. However, this is a substantial task which will take some time to complete. In the meantime, it is recognised that there remains a need for clear, adopted interim guidance from the Greater Manchester Combined Authority, to which designers can work when developing schemes, particularly those funded under the Greater Manchester Mayor's Cycling and Walking Challenge Fund (MCF) and other Active Travel funding administered by GMCA.
7. This Design Guide draws on the body of existing high quality UK design guidance on cycling and walking infrastructure to provide that interim guidance. It replaces the Greater Manchester Cycling Design Guidance (2014), which should no longer be used.
8. The standards outlined in this Design Guide **must** be followed for Bee Network schemes, and any other active travel schemes funded, or part funded, by GMCA. District Highway Authorities are also recommended to follow them for all other active travel schemes.

Key existing publications

9. There exist a number of key publications in the sphere of cycling and walking design guidance in the UK, on which this Design Guide draws:

- **Local Transport Note 1/20 Cycle Infrastructure Design (LTN 1/20)** (Department for Transport, 2020). This is the new national design guidance and is the standard by which the Department for Transport, and the new Active Travel England regulator, will judge all cycling infrastructure paid for through national government funding. It is therefore the primary design guidance tool for designers of cycling infrastructure in Greater Manchester and in cases of conflict between documents, LTN 1/20 should take precedence. It does not, however, cover walking-specific issues or broader considerations of quality of public space.
- **London Cycling Design Standards (LCDS)** (Transport for London, 2016). First published in 2014, and updated in 2016, LCDS remains current and the most detailed UK design guidance available on many aspects of cycling and walking design. Like LTN 1/20, however, it is solely focused on cycling
- **Welsh Active Travel Design Guidance** (Welsh Government, 2014). Whilst this document is the oldest of the design guides referenced, it remains relevant, most particularly since it considers pedestrian issues in much greater detail. Like LCDS, the Welsh Guidance is significantly dated in relation to its coverage of signal junctions and crossings.
- **Pedestrian Comfort Guidance for London** (Transport for London, 2010). A specific guidance tool for assessing levels of pedestrian activity and determining appropriate levels of pedestrian provision.
- **A Guide to Inclusive Cycling** (Wheels for Wellbeing, 2020). This is the fourth edition of Wheels for Wellbeing's guide, which provides invaluable guidance on ensuring that cycling facilities are accessible to all.
- **CYCLOPS – Creating Protected Junctions** (Greater Manchester Combined Authority/Transport for Greater Manchester, 2019). This technical note provides detail on the concept and design of Cycle Optimised Protected Signal (CYCLOPS) junctions.
- **NACTO – Global Street Design Guide** (Global Designing Cities Initiative/National Association of City Transportation Officials, 2016). The NACTO guide aims to set a new global standard for street design, and builds on worldwide experience. The NACTO guide was adopted by GMCA in 2017 as the Greater Manchester standard for street design.
- **SuDS in London: a Guide** (Transport for London, 2016). A key consideration in any urban design is drainage, and in particular the reduction of flood risk through the introduction of Sustainable Urban Draining Systems (SuDS) to minimise surface runoff. This Transport for London publication provides relevant guidance on the incorporation of SuDS into urban designs which is as relevant in Greater Manchester as it is in London.
- **Sustrans Traffic-free Routes and Greenways Design Guide** (Sustrans, 2019). As the guardians of the National Cycle Network, Sustrans has been designing and maintaining high quality off-road cycling and walking infrastructure for many years. This publication represents the most up-to-date UK guidance on the design of such infrastructure currently available.

‘Pedestrians’ and ‘cyclists’: who are we designing for?

10. From the outset, it is important to define for whom we are designing, since the terms ‘pedestrian’ and ‘cyclist’ are used as catch-all terms encompassing a variety of different street users with specific design needs.

11. The term ‘pedestrian’ encompasses not only people walking, but also those using the public environment in a variety of other ways, including:

- Those using wheelchairs, including electric wheelchairs and mobility scooters
- Those with sensory impairments, such as blind, partially sighted or deaf pedestrians who may experience the street environment quite differently
- Those pushing prams, buggies and double buggies
- Those using non-mechanically driven scooters
- Those using the street to spend time in, meet others in etc

12. Similarly, the term ‘cyclist’ not only applies to people riding conventional bicycles, but a number of other types of cycle which may require specific design parameters based on their differing dimensions/manoeuvrability. In particular:

- Adaptive cycles, hand cycles, wheelchair cycles and any form of cycle designed for use by those unable to use a standard bicycle
- Recumbent bicycles
- Tricycles
- Tandems
- Cargo bikes
- Bicycles towing trailers

Design guidance on key issues

13. Greater Manchester is committed to delivering high quality infrastructure for cycling and walking. In particular, we are developing the Bee Network to connect every community in Greater Manchester via a network of high quality cycling and walking routes known as *Beeways*. This is a key part of our vision to make these the modes of choice for shorter journeys. This Guide builds on the design guidance documents referenced above and experience gained from the early delivery of Beeways to date, to define a number of 'key issues' commonly encountered in the design of cycling and walking routes.

14. This Guide provides specific guidance on how to approach each key issue when designing active travel infrastructure, and also links to sections of existing documents for more detailed guidance. This Guide must be followed on all active travel schemes funded or part funded by the Greater Manchester Combined Authority. In instances where, for specific local reasons, standards referenced in this guide cannot be met, an exception must be agreed to be acceptable through Design Review Panel. In most cases this will be where there is a strong justification to provide a continuity of route through a short section where standards cannot be met due to the high quality of the remainder of the route, and its importance as a cycling/walking connection.

15. It is recommended that this Guide is followed in relation to all other schemes promoted by Greater Manchester district authorities and Transport for Greater Manchester.

Key Issue 1: Speed and volume of traffic

16. The speed and volume of traffic on any given road is a key determinant of the appropriate type of infrastructure for cycling and walking, and, in particular, enables the designer to answer two key questions:

    1. What type of crossings are required for pedestrians and cyclists?
    2. Is physical protection needed for cyclists?

17. Generally speaking, a two-way flow of 400 motor vehicles per hour at peak time (roughly equivalent to 4,000 vehicles per day) can be considered to be a threshold above which it will be necessary to provide some form of controlled crossing at locations where pedestrians (and potentially cyclists) need to cross the road – usually a zebra, puffin, toucan or parallel crossing. Additionally, above 8,000 vehicles per day, a signalised crossing will likely be preferable to a zebra or parallel crossing.

18. Similarly, above 4,000 vehicles per day, it will be necessary to provide some form of physical protection for cyclists on a Beeway: for example kerbed protection (as shown in figure 1), light protection or a terraced cycle track (not simply a painted lane). Below 4,000 vehicles per day, physical protection for cyclists will not usually be required on a Beeway, and pedestrian crossings can usually be uncontrolled (but see exceptions regarding speed and large vehicles below).

19. Interactions with Heavy Goods Vehicles (HGVs) and buses are particularly hazardous to cyclists, and collisions involving large vehicles are over-represented amongst serious and fatal cycle collisions. Consideration should therefore be given to the proportion of traffic which is represented by HGVs and buses. If HGVs/buses represent over 5% of motor traffic, physical protection for cyclists may be desirable, even if the overall traffic volume does not exceed 4,000 vehicles per day.

20. A further consideration is the speed at which vehicles are travelling. In addition to the above guidance on traffic volume, if the 85th percentile speed is over 25mph, physical protection for cyclists is likely to be needed on Beeways, even if traffic volumes are below 4,000 vehicles per day.

21. Before concluding that current traffic levels make protected cycle infrastructure and controlled crossings necessary, always consider whether it may be possible to reduce traffic levels and speeds on the street to a level where such measures will not be necessary, for example by modal filtering, restricting traffic movements at signals etc.

References for more detailed guidance: LTN 1/20, section 4.4, and Figure 4.1.

Figure 1: Example of protected cycle provision on a busy road: kerb protected cycle lane in Fallowfield (Manchester)

Figure 2: On streets with motor vehicle flows of under 4,000 per day, protected infrastructure for cycling is usually unnecessary, as even inexperienced cyclists will feel comfortable sharing space with light traffic flows

Figure 3: Filtered neighbourhood, London ensuring only local motor traffic uses this residential street, and creating a much easier walking and cycling environment.

Key Issue 2: Width of dedicated cycle facilities

22. This section considers widths of facilities designed solely for cyclists. Where cyclists share a lane with motor traffic, see Key Issue 4. Where cyclists share a facility with pedestrians, see Key Issue 5.

23. Cycle lanes and tracks should be designed with sufficient widths taking into account four key considerations:

    1. To ensure they are accessible to all types of cycle, which may include types of cycle significantly wider and/or longer than a standard bicycle
    2. To enable them to be swept and gritted by a mechanical street maintenance vehicle
    3. To enable faster riders to overtake slower ones safely without needing to leave the facility wherever possible
    4. To permit larger flows where peak cycle flows are expected to be over 200 cycles per hour

24. LTN 1/20 Table 5-2 provides clear guidance on cycle lane and track widths, concerning both desirable minimums and absolute minimums at constraints. This is replicated below. For purposes of the Bee Network, the desirable minimum widths below should be applied. The absolute minimum widths are only acceptable on Beeways over short lengths, typically less than 50m, to ensure route continuity where constraints exist.

Table 1: Cycle lane and track widths (source: LTN 1/20)

Cycle Route Type	Direction	Peak hour cycle flow (either one way or two-way depending on cycle route type)	Desirable minimum width* (m)	Absolute minimum at constraints (m)
Protected space for cycling (including light segregation, stepped cycle track, kerbed cycle track)	1 way	<200	2.0	1.5
		200-800	2.2	2.0
		>800	2.5	2.0
	2 way	<300	3.0	2.0
		>300-1000	3.0	2.5
		>1000	4.0	3.0
Cycle lane	1 way	All – cyclists able to use carriageway to overtake	2.0	1.5

*based on a saturation flow of 1 cyclist per second per metre of space. For user comfort a lower density is generally desirable.

25. A further consideration is the presence of fixed objects such as kerbs, and in particular immovable vertical obstructions such as walls, fences, trees etc which may reduce the effective width of the cycle track. Depending on the nature of such objects, up to an additional 0.5m may be required over and above the dimensions given above. Further guidance is provided in LTN 1/20 table 5-3.

References for more detailed guidance: LTN 1/20, section 5.5.

Key issue 3: Width of dedicated walking facilities

26. This section covers dedicated pedestrian facilities. Where cyclists and pedestrians share a facility, see Key Issue 5 (though note that there is a presumption against space shared between cyclists and pedestrians except in specific circumstances).

27. There are two key issues to consider around width of pedestrian facilities:

    1. The need for clear, continuous walking space to enable all users (including, for example, those pushing a double buggy or those with a visual impairment) to use the facility.

    2. The need to provide sufficient width to maintain a high level of pedestrian comfort

28. The first issue is very simple. A width of less than 1.4m will not permit use by a double buggy user and is unacceptable on the Bee Network. This width must be clear, continuous and free from any obstacles or obstructions such as bollards, parked vehicles, signs, trees etc. 1.4m should be regarded as an absolute minimum at localised constraints, and a minimum of 2.0m should be provided at all other locations.

29. The second issue requires consideration of the flows of pedestrians expected, as this will affect the width necessary to maintain a high level of pedestrian comfort. Detailed guidance is provided on this topic in Transport for London's *Pedestrian Comfort Guidance for London* (TfL, 2010). Assessment of pedestrian comfort using the above guidance is recommended in all cases, and is required as part of the scheme Full Business Case on Beeways where large volumes of pedestrians are expected, or where the width of a pedestrian facility is proposed to be less than 2m for a distance of over 50m. For Beeways, peak-time pedestrian comfort should be at a minimum of Pedestrian Comfort Level B as described in the above guidance (TfL, 2010).

References for more detailed guidance: Pedestrian Comfort Guidance for London (TfL, 2010).

Key Issue 4: Mixed traffic lane widths

30. This issue covers instances where cyclists share a lane with motor vehicle traffic. For instances where cyclists are provided with a dedicated lane or track, see Key Issue 2. For instances where cyclists share space with pedestrians, see Key Issue 5.

31. On Beeways, cyclists should only be expected to mix with motor traffic where that traffic is of a low volume and speed (see Key Issue 1 and LTN 1/20 section 4.4 for detailed guidance).

32. Where the requirements for sharing with motor traffic above are met, sharing between cyclists and motor traffic on Beeways is only acceptable where the width of the shared lane is either 3.25m or less, or 3.9m or more. Shared lane widths between 3.25m and 3.9m encourage drivers of motor vehicles to pass cyclists where there is insufficient space. Such lane widths are not permitted on a Beeway. Furthermore, any scheme implementing a Beeway should not introduce any new lane widths between 3.25m and 3.9m on any road, regardless of whether that route is part of the Bee Network.

33. Where a lane of less than 3.25m width is provided, this should be designed to encourage cyclists to adopt the 'primary' position in the centre of the lane, and motor vehicles either remain behind cyclists, or pull out of the shared lane to overtake cyclists.

References for more detailed guidance: LTN 1/20, section 7

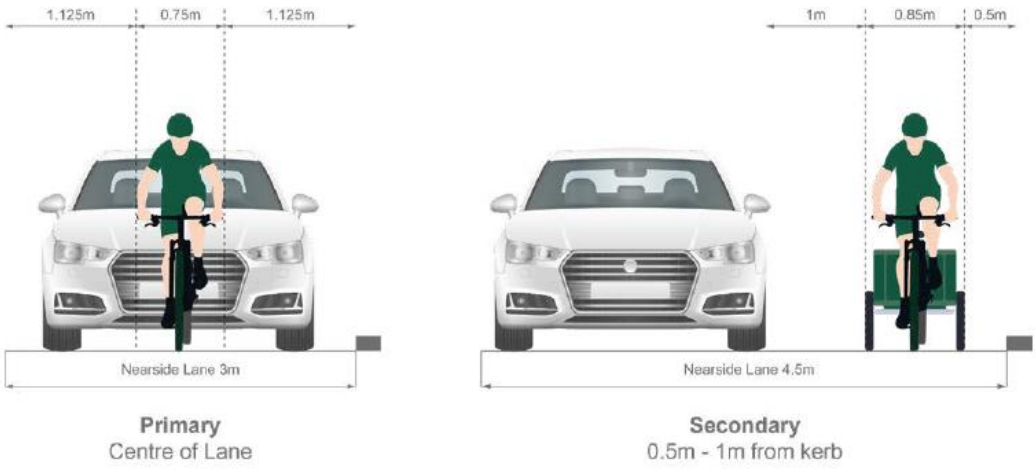


Figure 2: Primary and secondary riding positions (reproduced from DfT LTN 1/20)

Key Issue 5: 'Shared use' paths or footways

34. Paths and footways that are shared by pedestrians and cycles present a number of issues:

    1. They treat cyclists as pedestrians, rather than as vehicles, which creates conflict between cyclists and pedestrians and makes the route less attractive to both modes.
    2. They can significantly reduce the level of service and quality of experience for both pedestrians and cyclists, and therefore reduce the likelihood that the facility is used as intended.
    3. They can be confusing and intimidating to blind or partially sighted pedestrians.
    4. They create specific problems in providing priority for cyclists and pedestrians at certain locations such as side road crossings

35. For these reasons, shared use paths or footways are generally only acceptable as part of Beeways, or any other Active Travel scheme funded in whole or part by GMCA, where they are located away from the highway (for example traffic-free routes through parks or

on bridleways or former rail alignments). Away from motor vehicles, many of the issues of shared paths are mitigated, since the need to treat cyclists as vehicles to enable them to interact easily with the highway environment is less important. It is also likely that space will be less constrained, and that pedestrian levels may be lower, on paths away from the highway. Even in such scenarios, where flows of pedestrians and cyclists are likely to be high, providing physical separation between them Is preferable if space allows.

36. Shared use footways adjacent to the carriageway will only be acceptable as part of active travel schemes in Greater Manchester as a last resort to maintain route continuity at locations where all other possibilities have been thoroughly examined and found to be undeliverable. In particular, shared use footways adjacent to a carriageway must not form part of active travel schemes in Greater Manchester in any of the following circumstances:

- Where large volumes of either cycles or pedestrians (over 300 per hour total pedestrians and cyclists) are expected,
- At any location where there is significant frontage activity (for example at local shops)
- Where there are multiple side roads or private accesses to be crossed.

37. At locations where it is determined that shared use is appropriate (either away from the carriageway or adjacent to the carriageway in the circumstances outlined above) any such shared path must be a minimum of 3.0m in clear width free from fixed objects or obstructions, or 4.5m width where over 300 cyclists per hour are expected.

References for more detailed guidance: LTN 1/20 sections 1.6 and 6.5.

Key Issue 6: Access control barriers on traffic free routes

38. Historically, concerns over abuse of traffic-free cycling and walking routes by motorised vehicles of a variety of types have led to the introduction of barriers or other physical restrictions to prevent such incursion onto these routes.

39. Whilst such concerns can be legitimate, common barriers used to exclude motorised vehicles such as A-frames, K-frames and kissing gates also exclude many legitimate users, such as users of non-standard cycles, mobility scooters or double buggies. For this reason, such barriers are unacceptable on the Bee Network, or other new active travel infrastructure in Greater Manchester.

40. In particular, it is usually physically impossible to exclude motorcycles without also excluding many legitimate users such as those listed above. Use of any access control barriers on new active travel infrastructure in Greater Manchester will therefore usually be limited to those locations where there is concern about abuse by cars or other 4-wheeled motorised vehicles, and must have clear, specific, local justification agreed through the Cycling and Walking Design Review Panel as part of the development of the scheme business case. Acceptable solutions will usually either use bollards or offset barriers/gates with sufficient clearance to permit use by all legitimate users.

41. Any barrier used must provide a minimum width clearance of 1.5m to enable use by all legitimate users. Failure to provide this may result in breach of the Equality Act 2010.

References for more detailed guidance:

- Sustrans Traffic-Free Routes and Greenways Design Guide, Chapter 9;
- A Guide to Inclusive Cycling, (Wheels for Wellbeing, 2020) p 36-38

Figure 3: Accessible access control gate with lockable access for maintenance vehicles, Linnyshaw Loopline, Salford

Key Issue 7: Shared cycle and bus lanes

42. Cyclists are generally permitted access to bus lanes within Greater Manchester. Whilst such lanes will be attractive to a significant proportion of cyclists and potential cyclists, they are unlikely to be attractive and accessible for all. For this reason, alternatives should always be sought to route Beeways away from such shared lanes. Shared bus and cycle lanes will only be acceptable as part of the Bee Network in the following circumstances:

    1. Where alternatives have been considered as part of the preparation of the scheme business case, and it is concluded that a shared bus/bike lane represents the best option, considering value for money and level of service for all users; and
    2. Where there are fewer than 20 scheduled buses per hour using the bus lane; and
    3. Where a wide bus lane of at least 4.0m, and preferably 4.5m, width is provided. If 4.5m is achievable this should incorporate within it a mandatory 1.5m cycle lane (see Figure 6). As an alternative, a narrow bus lane of 3.25m may be provided, which should be designed to encourage cyclists to adopt the primary position such that buses will need to pull out of the lane in order to pass a cyclist. Shared bus and cycle lanes of between 3.25m and 3.9m are not acceptable on Bee Network schemes as they risk tempting bus drivers to pass cyclists without leaving sufficient space; and
    4. Where consultation with TfGM's Bus Services team has been undertaken as part of the scheme design, as lane width requirements may be dependent on local variations such as vehicle types and road geometry (wider lanes are required on bend areas to cater for the large swept path of rigid buses).

43. References for more detailed guidance: London Cycle Design Standards, Chapter 4 section 4.3.7.

Figure 6: Cycle Lane within a bus lane (image reproduced from London Cycle Design Standards)

Key Issue 8: Bus stops

44. Bus stops often represent a conflict location for cyclists and pedestrians, since conventional UK bus stop design usually creates one of two critical conflicts:

    1. Requiring cyclists on the carriageway to move out into a stream of moving traffic to pass stationary buses, at a point where buses are themselves pulling into the kerb to serve the bus stop – a very awkward 'scissor' movement.
    2. Requiring cyclists in off-carriageway facilities to merge into shared space with pedestrians around the location of the bus stop, often compounded by visibility issues caused by bus stop infrastructure such as shelters.

45. In locations with significant enough traffic flows to justify segregated facilities for cyclists, LTN 1/20 recommends two potential approaches to bus stop design which design out the conflict between buses and bikes:

1. **Bus stop bypass:** in this solution, a cycle track is taken around the rear of the bus stop. This type of design has the potential to introduce conflict and severance for pedestrians, which will need to be managed carefully (further guidance is provided in LTN 1/20 section 6.6). There is significant existing experience of delivery of bus stop bypasses in Greater Manchester already, with 26 having been in operation on the Wilmslow Road/Oxford Road corridor for a number of years already.

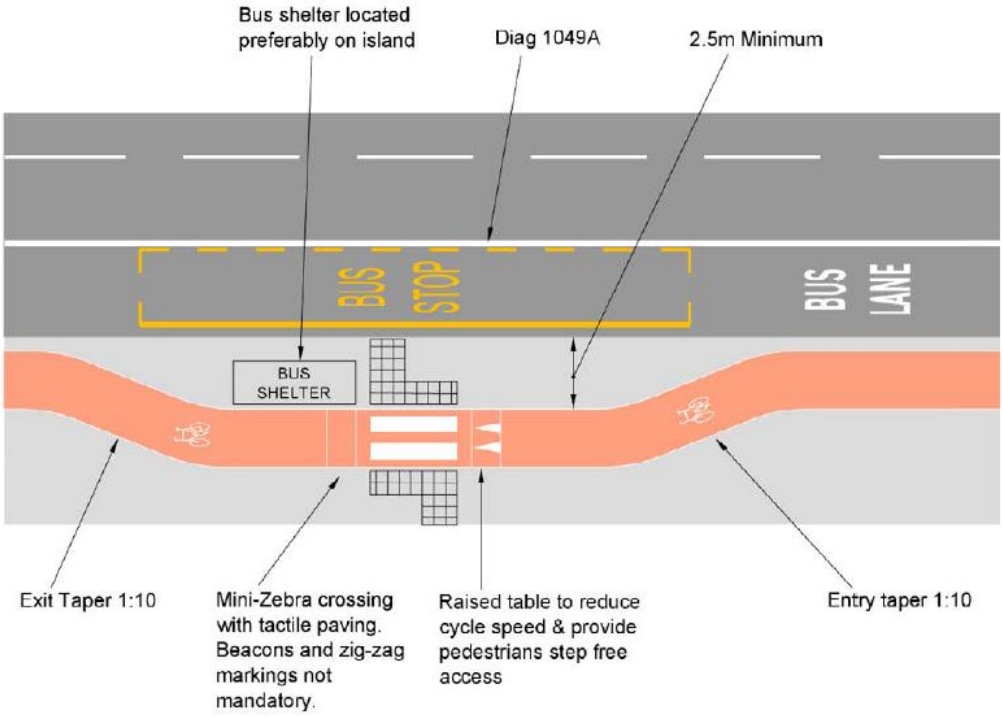


Figure 7: Typical Design Detail of a Bus Stop Bypass (source LTN 1/20)

2. **Shared bus stop boarder:** in this solution, cyclists are brought up onto a footway-level cycle track which passes between the footway and the edge of the carriageway, and doubles as a raised bus boarder from which pedestrians board the bus. This solution is how the majority of bus stops are designed in Denmark, but is uncommon in the UK currently. At the time of writing, there are no such bus boarders in operation in Greater Manchester. However, they have been used extensively in London and initial research suggests that they manage the potential conflicts between cyclists and pedestrians better than bus stop bypasses. They also require significantly less available width than bus stop bypasses. At the time of writing, TfGM is in the process of developing a trial of this type of bus stop layout. This trial will be conducted in consultation with users, bus operators, TfGM's Disability Design Reference Group and other stakeholders, with a view to testing their effectiveness in a Greater Manchester context and developing a standard design approach for such layouts in Greater Manchester. Until the conclusion of this trial, shared bus boarders are not currently recommended for installation in Greater Manchester.

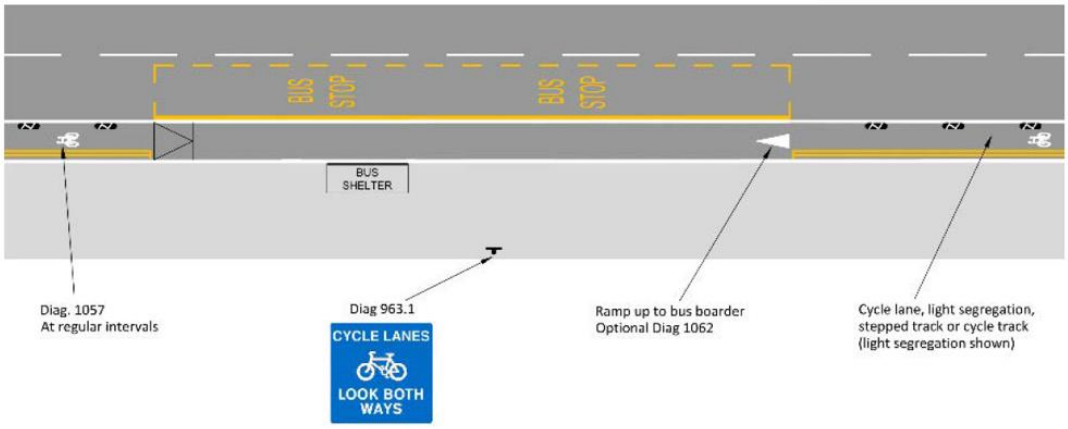


Figure 8: Typical Design Detail of a Shared Bus Boarder (source LTN 1/20)

46. Any Highway Authority considering making amendments to any bus stop as part of a Cycling and Walking scheme must consult closely with TfGM's Bus Facilities and Cycling and Walking Teams. Since the potential conflicts at bus stops are especially pertinent to pedestrians with some disabilities, particularly blind or partially sighted pedestrians, consideration should also be given to specific consultation with TfGM's Disability Design Reference Group on a case-by-case basis.

47. In locations where traffic flows are sufficiently low for cyclists to share a mixed traffic lane (generally less than 4,000 vehicles per day – see Key Issue 1), in most circumstances a standard bus stop will be sufficient, with conflicts between cycles and motor traffic sufficiently low due to the lightly trafficked nature of the road. However, where bus flows are high (typically greater than 10 buses per hour in each direction) or where the bus stop is used as a timing point or layover location, consideration should be given to one of the design options outlined above even where the overall traffic flow is below 4,000 vehicles per day.

Figure 9: Bus stop bypass, Oxford Road, Manchester

Key Issue 9: Headroom on cycle facilities

48. Cyclists ideally require a minimum of 2.4m of headroom at underbridges and subways. At existing structures, lowering the minimum headroom to 2.2m may be acceptable on a case-by-case basis, dependent on factors such as forward visibility. Where the minimum headroom cannot be achieved, a warning sign to TSRGD diagram 530A should be provided. Such exceptions will only be permitted on Beeways where there is clear, locally specific strategic justification as part of the scheme Business Case.

49. Signs of greater than 350mm width should be placed such that they do not overhang cycle infrastructure. Where this is unavoidable, the recommended minimum mounting height in the Traffic Signs Manual for most signs that may overhang cycle tracks is 2.3m.

50. It is noted that Bee Network wayfinding signs are all 350mm wide or less, and may therefore be placed at lower heights, even if these overhang cycle routes.

Key Issue 10: Crossing types (and which should be used where)

51. Regular pedestrian crossing opportunities should be provided on all routes, and in particular at locations where a walking route crosses a major road. Crossings should be located as close to the pedestrian desire line as possible. Pedestrian crossings may be located at junctions, or they may be standalone. On roads that form part of the Bee Network, crossing facilities appropriate to the type of road must be provided at least every 400m.

52. All crossings provided on the Bee Network where a Beeway crosses a main road should be of a type able to be used by both pedestrians and cyclists, unless otherwise agreed on a case by case basis through Design Review Panel. Wherever possible, a crossing type which avoids the need for shared space between pedestrians and cyclists should be selected, usually either a ‘parallel zebra’ or ‘signalised parallel' (‘Sparrow’) crossing. The signalised option is likely to be preferable where motor vehicle flows are greater than 8,000 per day.

53. Toucan crossings should be avoided except where the cycle/pedestrian feeder routes to both sides of the crossing are shared use paths (which themselves should be avoided in most circumstances as per the guidance in Key Issue 5). In any other circumstances, toucan crossings will only be acceptable as part of active travel schemes in Greater Manchester where all other options have been thoroughly investigated and shown, as part of the project Full Business Case, to be undeliverable. The crossing selection tool in Appendix B should be used to assist in selecting the best crossing solution for any given scenario.

54. In instances where a crossing for pedestrians only is required, where vehicle flow is over 4,000 per day, this should be provided as a controlled crossing: usually either a zebra crossing or (where vehicular flow is greater than 8,000 per day) a puffin crossing.

55. Appendix A provides standard details of a number of key crossing types. Appendix B provides a crossing selection tool to assist scheme designers.

56. District Highway Authorities are recommended to engage early with TfGM’s Urban Traffic Control (UTC) team to select and design the most suitable crossing option in each local circumstance. Authorities are also required to commission the TfGM UTC team to either undertake, or review, the design of any signalised pedestrian crossing installations in Greater Manchester.

References for more detailed guidance:

- LTN 1/20 section 10.4
- Welsh Active Travel Design Guidance, sections 6.35-6.37.

Figure 10: Parallel zebra crossing, London

Figure 11: Sparrow crossing, Cheadle Hulme, Stockport (image courtesy of Stockport Council)

Key issue 11: Signal junctions

57. Whilst designs providing good quality facilities for pedestrians at signal junctions have been commonplace for years in the UK, providing facilities of comparable quality for cyclists at such locations has been an aspect of cycle infrastructure design which has historically been problematic. However, it is an area where a great deal of progress has been made in the last decade, particularly in London and Greater Manchester.

58. LTN 1/20 section 10.6 describes in some detail a number of options which have been developed to provide high quality provision for cyclists at signal junctions, namely (and generally in descending order of the level of priority provided for cyclists):

    1. Cycle bypasses
    2. Separate cycle phases
    3. Cycle and pedestrian-only stage
    4. Hold the left
    5. Two stage right turns
    6. Cycle gate
    7. Early release
    8. Advanced stop lines

59. All of the above aspects will have a role to play in active travel infrastructure in Greater Manchester, on a location-specific basis. District Highway Authorities are recommended to engage early with TfGM's Urban Traffic Control (UTC) team to select the best option in each local circumstance. Authorities are also required to commission the TfGM UTC team to either undertake, or review, the design of any signals installations in Greater Manchester.

60. In addition to the options described in LTN 1/20, TfGM has developed an advancement on the 'Cycle and pedestrian-only stage' option described at section 10.6 of LTN 1/20: the Cycle Optimised Protected Signal (CYCLOPS) junction.

61. A CYCLOPS junction enables full adoption of Dutch principles at signal junctions and enables full protection for cyclists and pedestrians to be provided on all movements in the junction, without pedestrians and cyclists having to share space. The key innovation which has enabled this is the 'flipping' of the pedestrian and cycle movements in the circulatory system such that cycles are on the *outside* of pedestrians. This is the opposite arrangement to that found at most signal junctions in the Netherlands. However, crucially, it enables the pedestrian and cycle phases to run at the same time without the cycles conflicting with green man signals for pedestrians, which is critical in UK regulations.

62. At the time of writing (January 2021), two CYCLOPS junctions have already been completed and are operational, in Manchester and Bolton respectively. Whilst the approach is previously untested, these junctions have been well received by users initially and over thirty other CYCLOPS designs are currently in various stages of development and delivery across Greater Manchester. Early indications are that the principle is very adaptable to different junction geometries.

Figure 12: Aerial view of the first completed CYCLOPS junction in the UK: Hulme, Manchester

63. As with all signal junction installations, districts are recommended to engage early with TfGM's UTC team to determine whether a CYCLOPS junction, or any of the other options listed above, may be appropriate at any given location.

64. LTN 1/20 includes the 'Junction Assessment Tool' at Appendix B. This is a very useful tool for assessing the level of service provided to cyclists at junctions. It does not consider pedestrian movements, however. Each junction movement is assessed on a 'red/amber/green' scale where a green indicates a movement able to be made easily by cyclists of all levels of experience, and a red represents a movement where conditions exist which are most likely to give rise to the most common collision types, and would therefore be challenging for even experienced cyclists to navigate safely. All junction movements which would be made as part of the Bee Network must conform to the 'green' standard described in the Junction Assessment Tool.

References for more detailed guidance:

- LTN 1/20 section 10.6 and Appendix B: Junction Assessment Tool
- London Cycle Design Standards section 5.4.
- CYCLOPS – Creating Protected Junctions (Greater Manchester Combined Authority/TfGM, 2019)

Figure 13: 'Hold the left' protection for two-way cycle track, Nottingham

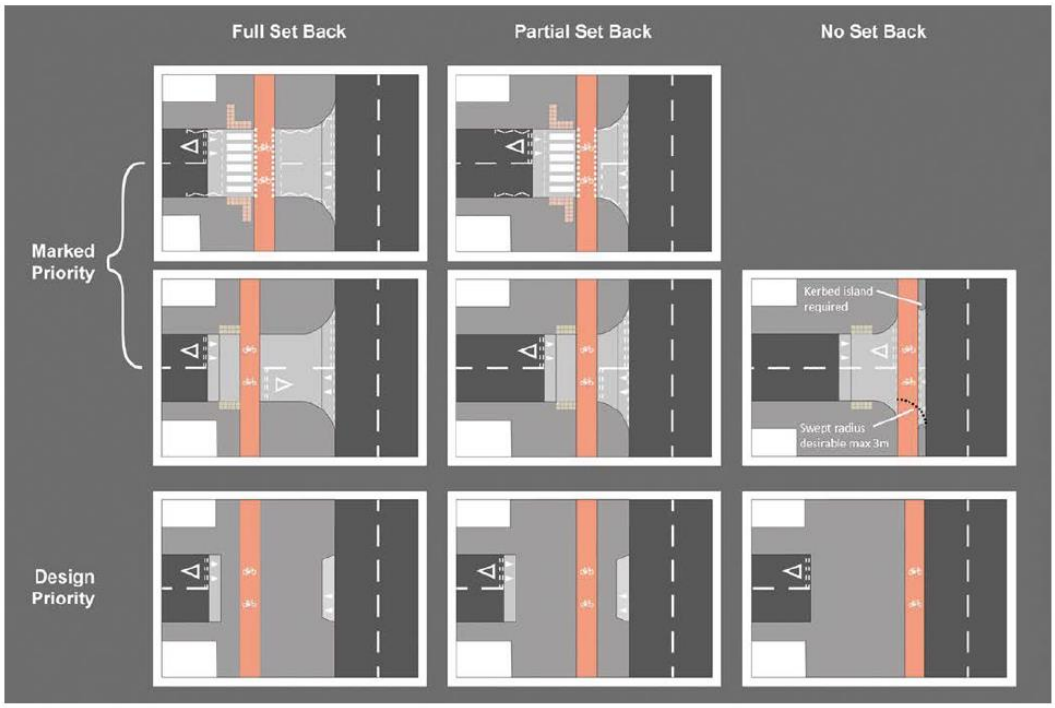
Figure 14: Protected right turn dedicated cycle phase, Trafford

Key issue 12: Side road crossings

65. Crossing side roads is a significant hazard for both pedestrians and cyclists, as standard UK approaches to side road junctions bring users of both modes into regular conflict with motor vehicles turning across them, potentially at speed. These conflicts can be reduced, or designed out entirely, by the adoption of a variety of potential approaches, as outlined

in section 10.5 of LTN 1/20, and specifically as shown in figure 15, which is reproduced from LTN 1/20 below. This shows options for providing for cycle and pedestrian priority at side roads in urban areas, classified by the position of the cycle facility relative to the major road kerbline:

1. Full set back – at least a car length (5m) from the kerbline;
2. Partial set back – less than a car length from the kerbline;
3. No set back – at the kerbline



* Note – yellow globes at parallel crossings omitted for clarity.

Figure 15: options for provision of priority for pedestrians and cycles at side road crossings, reproduced from LTN 1/20

66. All the above options are described in greater detail in paragraphs 10.5.7 to 10.5.34 of LTN 1/20, and are acceptable as part of Bee Network schemes.

67. In all cases, speed reduction measures through and on the approaches to junctions, and on turning, are recommended as measures that will benefit both cyclists and pedestrians. The following features, adapted from LTN 1/20, may be considered to help achieve this:

- Reducing all movements through a junction to a single lane;
- Adopting lane widths that allow cyclists to comfortably take either the secondary position or (when traffic flows and speeds are low) the primary position (see Key Issue 4);
- Tight corner radii and raised entry treatments or wider junction tables that slow vehicles at the conflict points;
- Banning one or more turning movements that conflict with major cycle flows (and ensuring that the conflict is not simply transferred elsewhere);
- Providing refuges to allow cycles to cross junctions and to turn in more than one stage, but being careful to avoid creating pinch points;
- Changing priorities at junctions to give priority to a heavy cycle flow, possibly requiring a change of layout; and

- Providing road markings to highlight the presence of cyclists to other road users, such as cycle symbols to TSRGD diagram 1057, lines to TSRGD diagram 1010 and advisory cycle lanes, as well as coloured surfacing.

68. Untreated, traditional side roads which do not communicate priority for pedestrians and cyclists over turning traffic, and which have large turning radii permitting high entry/exist speeds are not acceptable on Beeways.

References for more detailed guidance: LTN 1/20, section 10.5.

Figure 16: Side road with marked priority for cyclists and pedestrians, Walthamstow

Key issue 13: Surface quality and trip hazards

69. Surface quality is very important for both cyclists and pedestrians.

70. For pedestrian facilities, surfaces should be level, smooth and well maintained, and free from standing water. Tactile paving should be clear, unambiguous and conform to relevant Department for Transport guidance. Pedestrian facilities should be free from all trip hazards, defined as a non-contrasting level difference of greater than 20mm.

71. For cycle facilities, ideally a sealed asphalt or macadam surface should be provided, except where this is not possible due to local considerations. Where such a surface is not possible, a variety of alternative surfaces exist which provide a high quality, bound surface for cycling, but also permit permeability to water, and will be acceptable to other users, including equestrians. Unbound or loose surfaces such as mud or gravel are not acceptable for use on Beeways, as these make cycling more difficult and can represent a skid hazard to cyclists. They can also become muddy in periods of wet weather. Consultation with TfGM's Cycling and Walking team is recommended to explore non-asphalt/macadam surfacing options.

References for more detailed guidance:

- LTN 1/20 section 8.5
- Wheels for Wellbeing: A Guide to Inclusive Cycling, p43-45

Key Issue 14: Gradient

72. For all new cycling and walking facilities, it is important to take the opportunity to minimise any gradients, since they pose challenges for many users, particularly those who are older or disabled. No gradients of greater than 5% should be included on any new Beeways *except where:*

    1. Local topography means a steeper gradient is necessary; and
    2. Site constraints prevent the gradient being engineered out in a way which represents value for money; and
    3. Alternative routes have been considered and have been found to be unsuitable/unattractive.

73. People can walk or cycle short stretches of relatively steep gradient, but many will not be capable of maintaining the higher levels of effort required on gradients over longer distances. For this reason, the maximum recommended gradient differs depending on the length of the hill. These are shown in Table 2, below, which is reproduced from section 5 of LTN 1/20.

Table 2: Maximum lengths for gradients of varying steepness (source: LTN 1/20)

Gradient %	Desirable maximum length of gradient (m)
2.0	150
2.5	100
3.0	80
3.5	60
4.0	50
4.5	40
5.0	30

74. It is recognised that cycle and pedestrian routes along existing roads and paths will usually have to follow the existing gradient. However, where gradients exceed those shown in Table 2, and cannot be engineered to comply with Table 2 in a way which represents value for money, signing the Bee Network via alternative, less steep routes should be considered.

75. Cycle routes should not be constructed with crossfall exceeding 2.5% gradient, as steep crossfall can cause bikes to slide, and can destabilise cycles with more than two wheels.

References for more detailed guidance:

- LTN 1/20 section 5.9 (and in particular table 5-8, which is reproduced above)
- Wheels for Wellbeing Guide to Inclusive Cycling, p43

Key issue 15: The ‘door zone’

76. Historically, roads and cycle lanes in the UK have often been designed such that cyclists are encouraged to pass close to kerbside car parking or loading bays. This is potentially very hazardous, since an opening car door can inflict serious injury or death on a passing cyclist, or cause them to veer suddenly into the path of motor traffic.

77. All new active travel schemes in Greater Manchester must design out this potential hazard by either:

    - Where cyclists are accommodated in physically protected lanes, routing these lanes to the nearside of parked vehicles, incorporating a buffer zone of 0.5m in width between the parked vehicles and the cycle lane; or

- Where cyclists are accommodated in a mixed traffic lane, placing cycle symbols to diag. 1057 in the primary position central to the lane width between the edge of the parking bay and the centre of the carriageway; or
- Removing or relocating the on-street car parking such that it no longer affects the cycle route.

References for more detailed guidance: LTN 1/20 sections 6.2.40 to 6.2.43.

Key issue 16: Lighting

78. Lighting of cycling and walking routes is very important in order to ensure they are accessible to all. Unlit routes can be intimidating to many users after dark. Given that many utility trips will occur during hours of darkness, particularly in winter, lack of good quality lighting is a major deterrent to year-round cycling and walking.

79. Lighting for all on-road Beeways should comply to the British Standard 5489-1:2003 Code of Practice for the Design of Road Lighting. Where new lighting is installed, this should use LED equipment as such lights give a far better quality of light and are more energy efficient.

80. Off-road Beeways should also be provided with full ambient lighting, ideally to the same standards referenced above. It is recognised that such lighting may not be appropriate or possible in some locations away from the highway, for example for ecological or planning reasons. In these instances, it is recommended that either low level bollard lighting be installed, or solar powered LED road studs embedded in the track surface. Solar powered road studs are not recommended where there is deciduous tree cover, since the studs can become obscured by leaf litter.

81. All Beeways, either on-road or off-road, must be equipped with at least some form of lighting.

References for more detailed guidance:

- LTN 1/20 section 8.7
- Sustrans Traffic-free Routes and Greenways Design Guide, section 10.1.

Key issue 17: Cycle parking

82. High quality cycle parking should be provided as an integral part of all Beeways. This should include as a minimum:

    1. Short stay cycle parking installations at locations of trip origin or destination along the route, such as local shops, parks, schools and places of worship (see figure 17).
    2. Longer stay parking at major trip destinations such as public transport stops and significant employment locations (see figure 18). Scheme promoters should work with local major employers as necessary through the Activation Plan developed as part of the project Business Case to ensure that potential users of the proposed Beeways have access to high quality cycle parking.
    3. Consideration should also be given to the need for parking provision for non-standard cycles.

83. All cycle parking should be:

    - Visible
    - Accessible, located at or very close to the end destination (usually the pedestrian entrance to the destination being served)

- Safe and secure, both in terms of security of the bike, and the personal safety of the user when parking the bike
- Consistently available – often small clusters of stands at frequent intervals work better than larger concentrations at fewer sites, except at major destinations with single points of access, such as office blocks or public transport stops.
- Easy to use
- Fit for purpose
- Well managed and maintained
- Coherent, in terms of its relationship to other cycle infrastructure
- Covered, unless intended for very short stay durations of less than 2 hours

84. Section 11 of LTN 1/20 provides detailed guidance on cycle parking, including design dimensions for stand spacing and suggested numbers of stands at specific locations.

References for more detailed guidance:

- LTN 1/20, section 11.
- A Guide to Inclusive Cycling, Chapter 5.

Figure 17: high quality on-street short-stay cycle parking incorporating planting features, Stockport

Figure 18: Long-stay, open-access covered cycle parking at a local rail station, Amsterdam

Key Issue 18: Streetscape

85. The purpose of this Guide is not to provide detailed guidance on landscaping and the appearance of streetscapes. Detailed guidance on this is provided in a variety of sources, most notably the NACTO Global Street Design Guide. Further guidance for Greater Manchester will be incorporated in the future Streets for All Design Guide.

86. However, a number of core principles exist to which all Active Travel schemes within Greater Manchester should seek to adhere:

- **Minimising street clutter:** all schemes should look to minimise street clutter and provide as clear and spacious a street environment as possible.
- **Provision of places to rest and spend time:** streets are not just transport corridors, but in the context of pedestrian usage are public places and should be pleasant places to spend time. Locations to rest or spend time and encourage wider uses of the street – such as play, performance and community functions – should be incorporated as part of designs wherever possible.
- **Maximising street trees:** trees benefit environmental quality in many different ways. All active travel schemes in Greater Manchester should aim to increase the numbers of trees in the street environment.
- **Sustainable Urban Drainage Systems (SUDS):** street designs should aim to reduce flood risk by minimising surface water runoff through incorporating sustainable urban drainage systems, usually in the form of street level planting. Detailed guidance is provided in the Transport for London publication *SuDS in London – a Guide.*
- **Installation of public artwork** or other features to assist in creating a 'sense of place' and encourage people to linger and spend time in the street environment.

References for more detailed guidance:

- NACTO Global Street Design Guide, especially chapter 5 (Designing Streets for Place) and section 10 (Streets)
- SuDS in London: a Guide

Figure 19: Incorporation of SUDS to Active Neighbourhood scheme, Cardiff

Figure 19: Incorporation of SUDS to Active Neighbourhood scheme, Cardiff

Appendix A

Appendix A: Crossing Standard Details

This appendix contains standard details of a number of the types of crossing which may be used on roads with sufficient traffic flow to justify signal controlled crossings (usually those with flows of over 8,000 PCUs – see Key Issue 10).

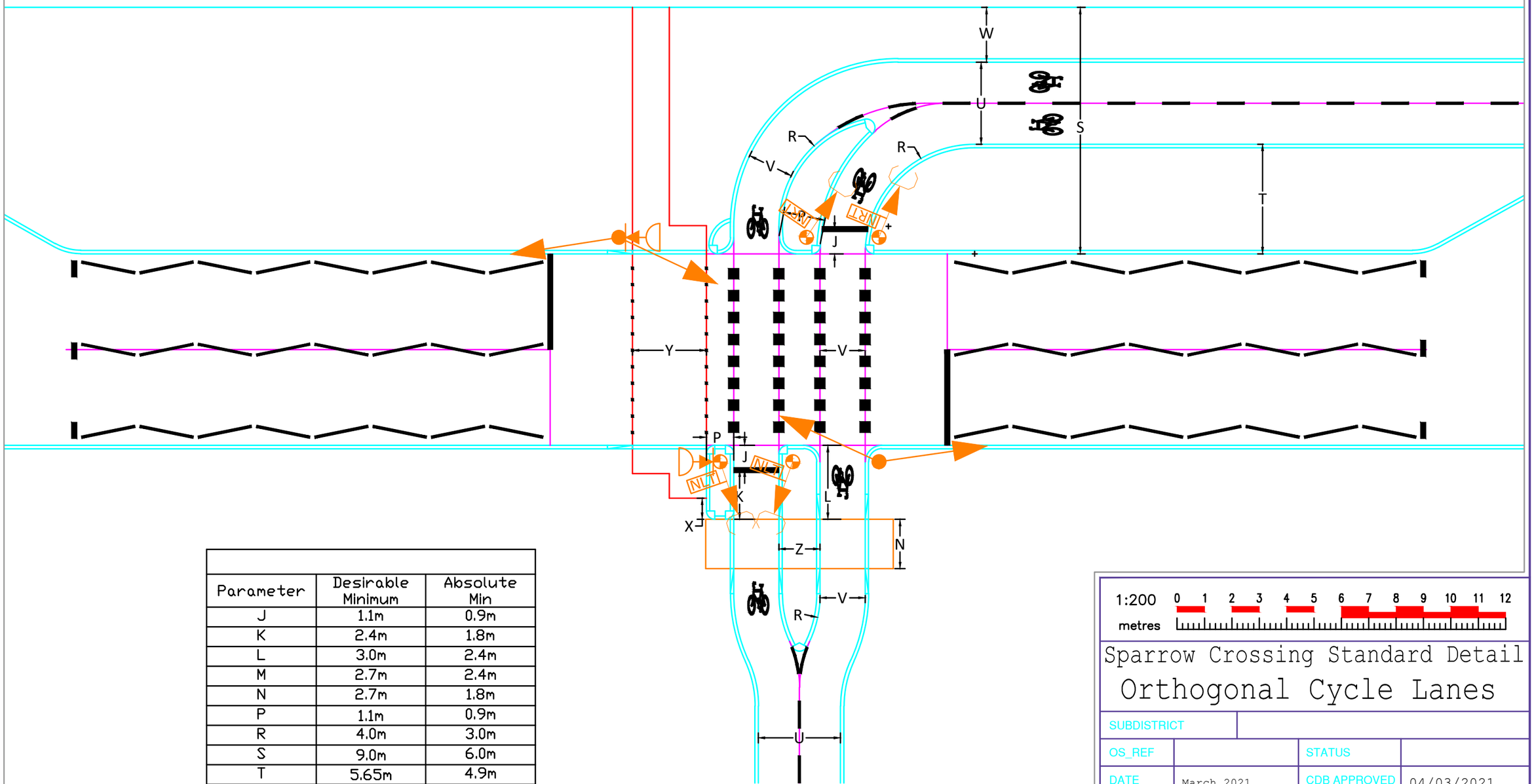
The following standard details are provided:

- A.1: Sparrow Crossing, orthogonal cycle lanes
- A.2: Sparrow Crossing, non-orthogonal cycle lanes
- A.3: CYCLOPS Crossing
- A.4: Toucan Crossing, standard shared space
- A.5: Toucan Crossing, two-way cycle lane into shared space
- A.6: Toucan Crossing, two-way cycle lane signalised
- A.7: Toucan Crossing, two-way cycle lane bypass
- A.8: Toucan Crossing, one-way cycle lane signalised
- A.9: Toucan Crossing, one-way cycle track bypass

Options A4 to A9 should only be used where options which do not involve sharing space between pedestrians and cyclists (such as those in options A1 to A3) have been thoroughly examined and been found to be undeliverable in a specific location. In particular, options A.4 and A.5 are not recommended for use on Bee Network schemes, and detailed justification of their use must be provided as part of the Full Business Case for any scheme funded in whole or part by GMCA.

The Crossing Selection Tool in Appendix B will assist designers in selecting the most appropriate crossing variant for any given location, in the most common Bee Network scenario: the need to connect two side roads for pedestrians and cyclists across a busy road.

A.1



Parameter	Desirable Minimum	Absolute Min
J	1.1m	0.9m
K	2.4m	1.8m
L	3.0m	2.4m
M	2.7m	2.4m
N	2.7m	1.8m
P	1.1m	0.9m
R	4.0m	3.0m
S	9.0m	6.0m
T	5.65m	4.9m
U	3.0m	2.5m
V	2.0m	1.65m 1.5m if r>15m
W	2.0m	1.8m
X	0.6m	0.3m
Y	2.7m	2.4m
Z	1.8m	1.5m

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Sparrow Crossing Standard Detail

Orthogonal Cycle Lanes

SUBDISTRICT			
OS_REF		STATUS	
DATE	March 2021	CDB APPROVED	04/03/2021
DRAWN BY	RL	CHCKD BY	RB
FILENAME	Parallel Crossing Standard Details.dwg		
XREFS			REV
DWG No.	A4/Sparrow/2-way/SSD1		-

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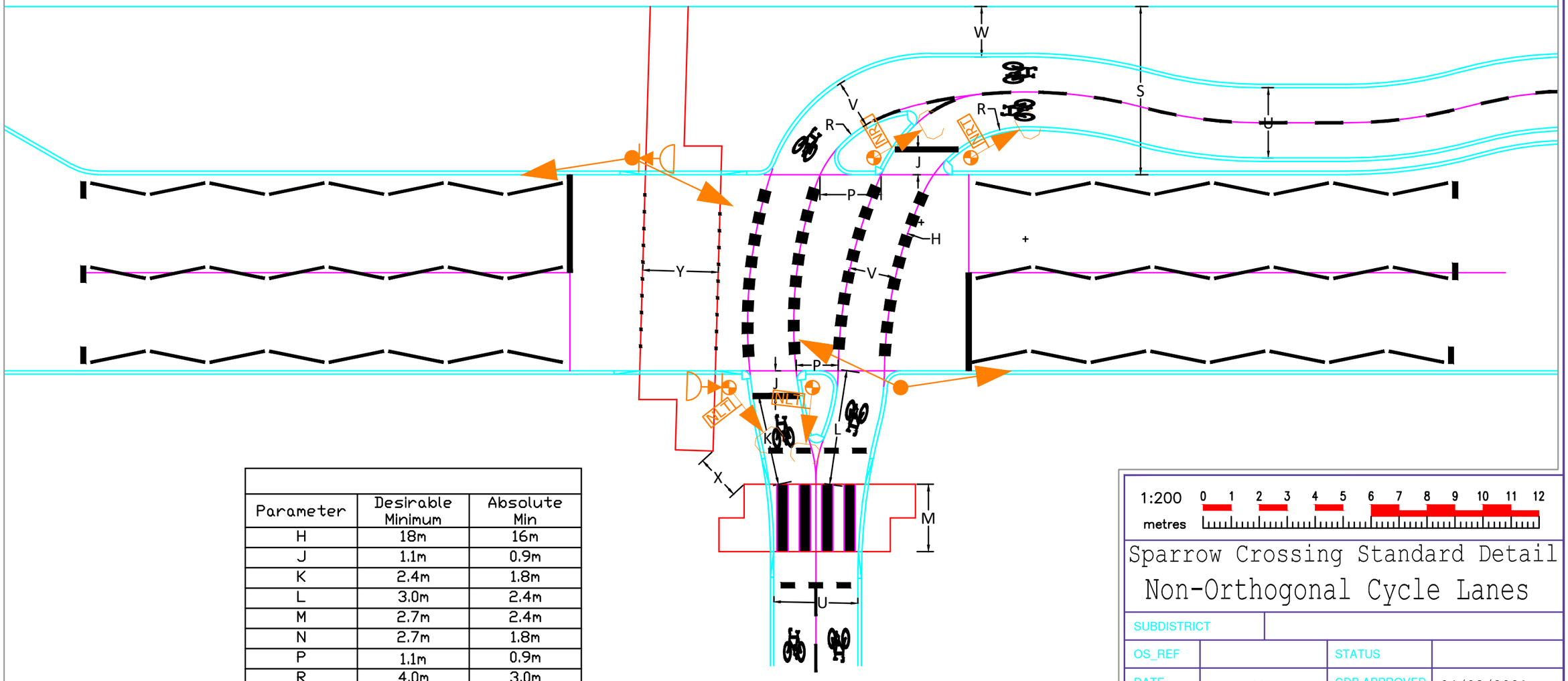
A.2



Parameter	Desirable Minimum	Absolute Min
H	18m	16m
J	1.1m	0.9m
K	2.4m	1.8m
L	3.0m	2.4m
M	2.7m	2.4m
N	2.7m	1.8m
P	1.1m	0.9m
R	4.0m	3.0m
S	9.0m	6.0m
T	5.65m	4.9m
U	3.0m	2.5m
V	2.0m	1.65m 1.5m if r>15m
W	2.0m	1.8m
X	0.6m	0.3m
Y	2.7m	2.4m
Z	1.8m	1.5m

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Sparrow Crossing Standard Detail
Non-Orthogonal Cycle Lanes

SUBDISTRICT			
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FILENAME	Parallel Crossing Standard Details.dwg		
XREFS			REV
DWG No.	A4/Sparrow/2-way/SSD2		-

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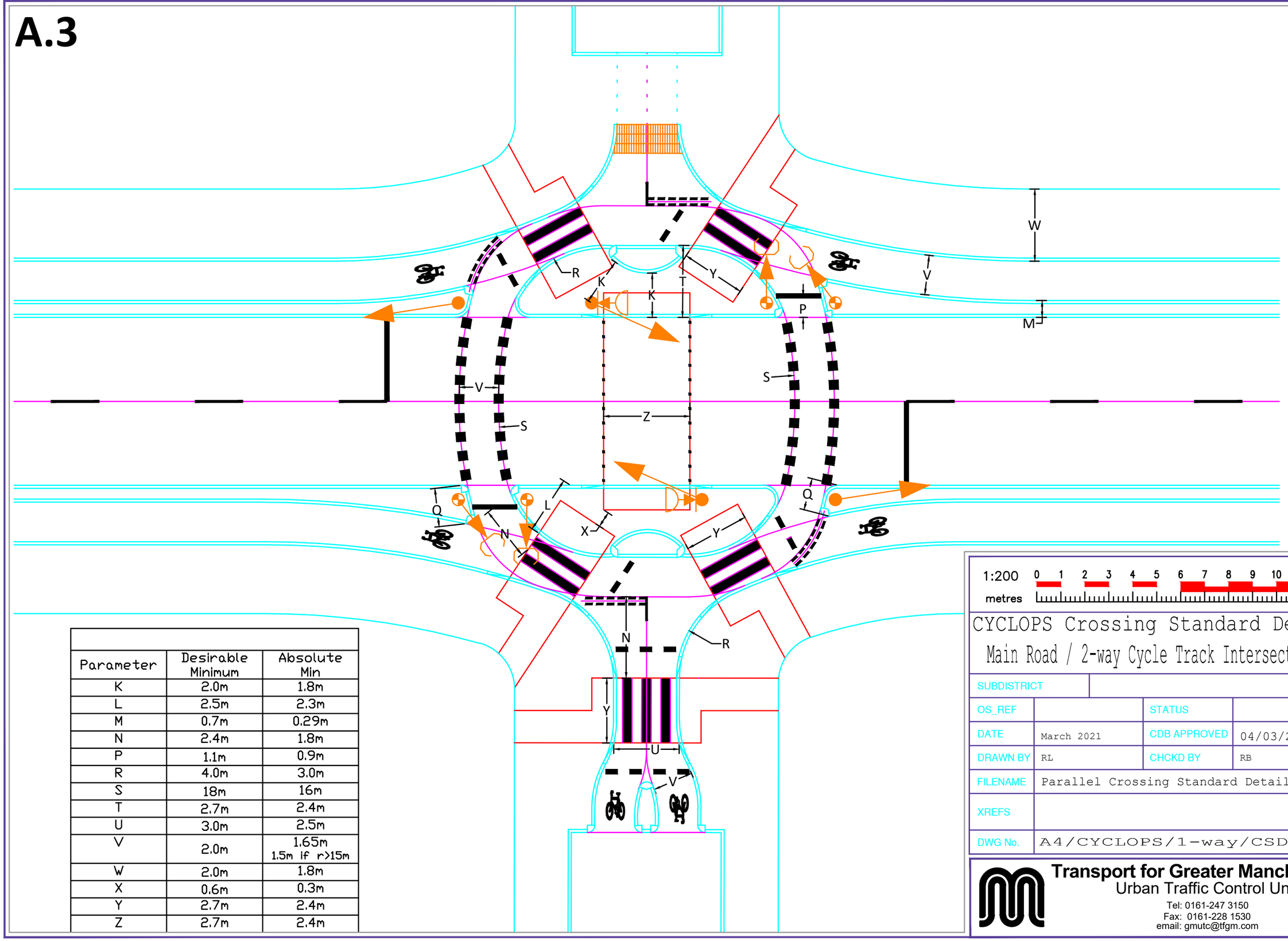
A.3



Parameter	Desirable Minimum	Absolute Min
K	2.0m	1.8m
L	2.5m	2.3m
M	0.7m	0.29m
N	2.4m	1.8m
P	1.1m	0.9m
R	4.0m	3.0m
S	18m	16m
T	2.7m	2.4m
U	3.0m	2.5m
V	2.0m	1.65m 1.5m if r>15m
W	2.0m	1.8m
X	0.6m	0.3m
Y	2.7m	2.4m
Z	2.7m	2.4m

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

CYCLOPS Crossing Standard Detail

Main Road / 2-way Cycle Track Intersection

SUBDISTRICT			
OS_REF		STATUS	
DATE	March 2021	CDB APPROVED	04/03/2021
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FILENAME	Parallel Crossing Standard Details.dwg		
XREFS			REV
DWG No.	A4/CYCLOPS/1-way/CSD1		-

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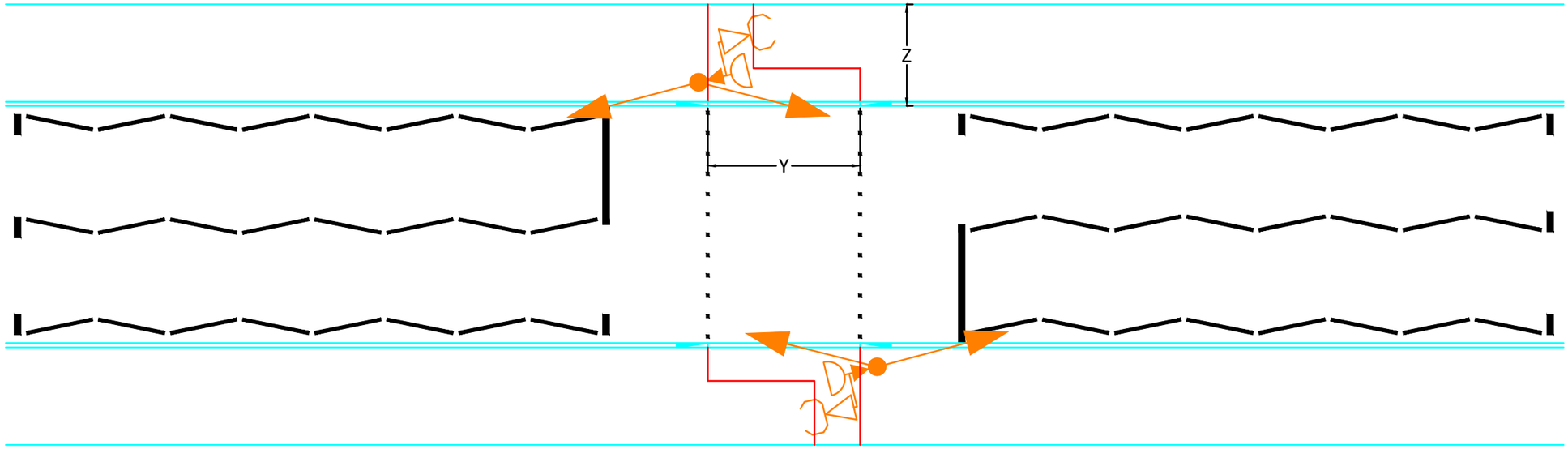
A.4



Parameter	Desirable Minimum	Absolute Min
Y	3.6m	3.0m
Z	4.0m	3.0m

Notes:
Traffic signal detection omitted for clarity.

1:200 0 1 2 3 4 5 6 7 8 9 10 11 12 metres

Toucan Crossing Standard Detail

simple shared space

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
DRAWN BY	EG	CHCKD BY	RB
FILENAME	Toucan Standard Details.dwg		
XREFS			REV
DWG No.	A4/Toucan/2-way/TSD1		-

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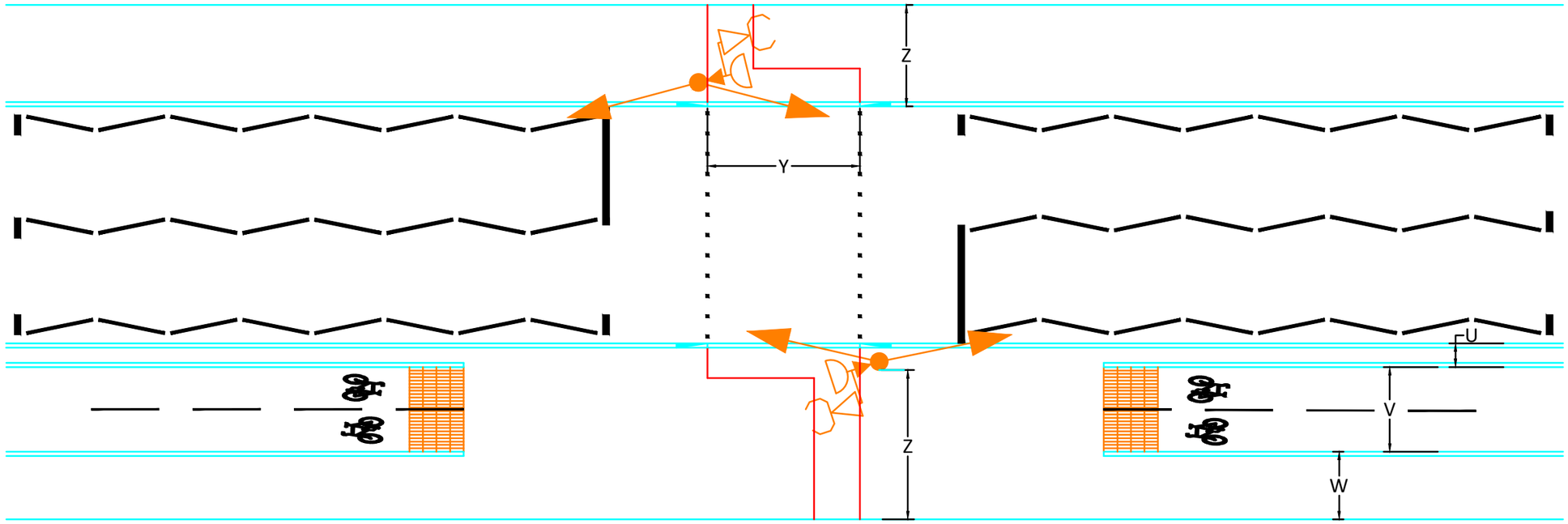
A.5



Parameter	Desirable Minimum	Absolute Min
U	0.8m	0.5m
V	3.0m	2.5m
W	2.0m	1.8m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
Traffic signal detection omitted for clarity.
Left hand poles optional.

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Toucan Crossing Standard Detail
2-way cycle lane into shared space

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
DRAWN BY	EG	CHCKD BY	RB
FILENAME	Toucan Standard Details.dwg		
XREFS			REV
DWG No.	A4/Toucan/2-way/TSD1		-

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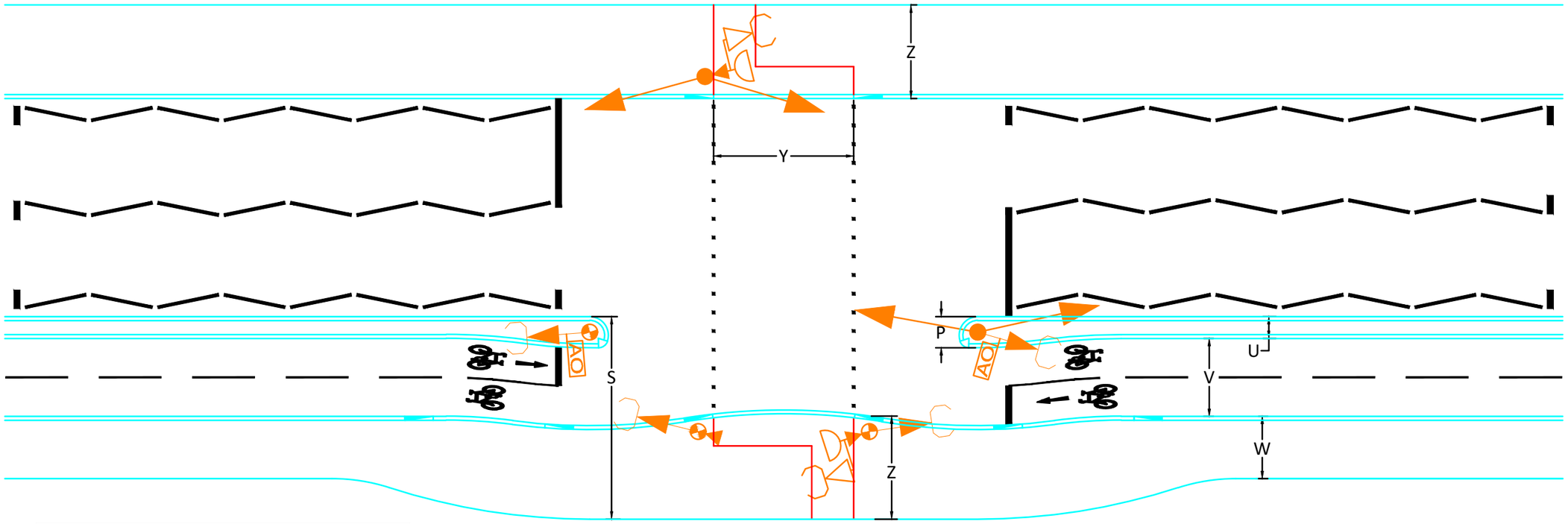
A.6



Parameter	Desirable Minimum	Absolute Min
P	1.0m	1.0m
S	6.5m	6.25m
U	0.8m	0.5m
V	3.0m	2.5m
W	2.0m	1.8m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
Suggested wavy kerbline makes area between segregation islands smaller and less appealing as a refuge. This may reduce the incidence of pedestrians attempting to cross in gaps. It also helps maximise the shared space area. Traffic signal detection omitted for clarity. Left hand poles optional.

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Toucan Crossing Standard Detail

2-way cycle lane signalised

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
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FILENAME	Toucan Standard Details.dwg		
XREFS			REV
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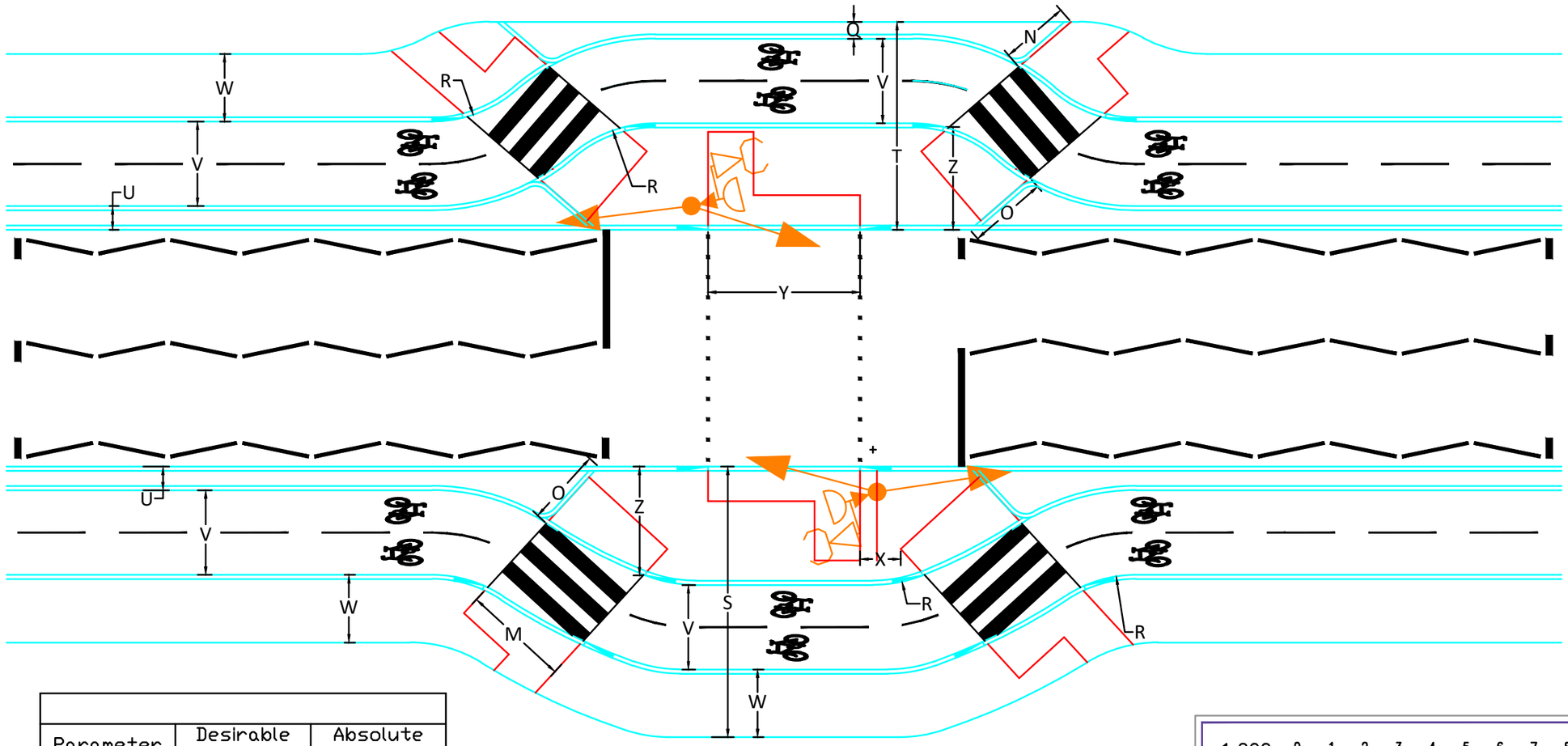
A.7



Parameter	Desirable Minimum	Absolute Min
M	3.6m	2.4m
N	2.0m	2.5m
O	3.0m	2.5m
Q	0.5m	0.25m
R	4.0m	3.0m
S	8.0m	7.3m
T	6.5m	5.75m
U	0.8m	0.5m
V	3.0m	2.5m
W	2.0m	1.8m
X	0.6m	0.3m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
South side full footway bypass.
North side no footway bypass.
Traffic signal detection
omitted for clarity.
Left hand poles optional.

1:200 0 1 2 3 4 5 6 7 8 9 10 11 12
metres

Toucan Crossing Standard Detail

2-way cycle lane by-pass

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
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XREFS			REV
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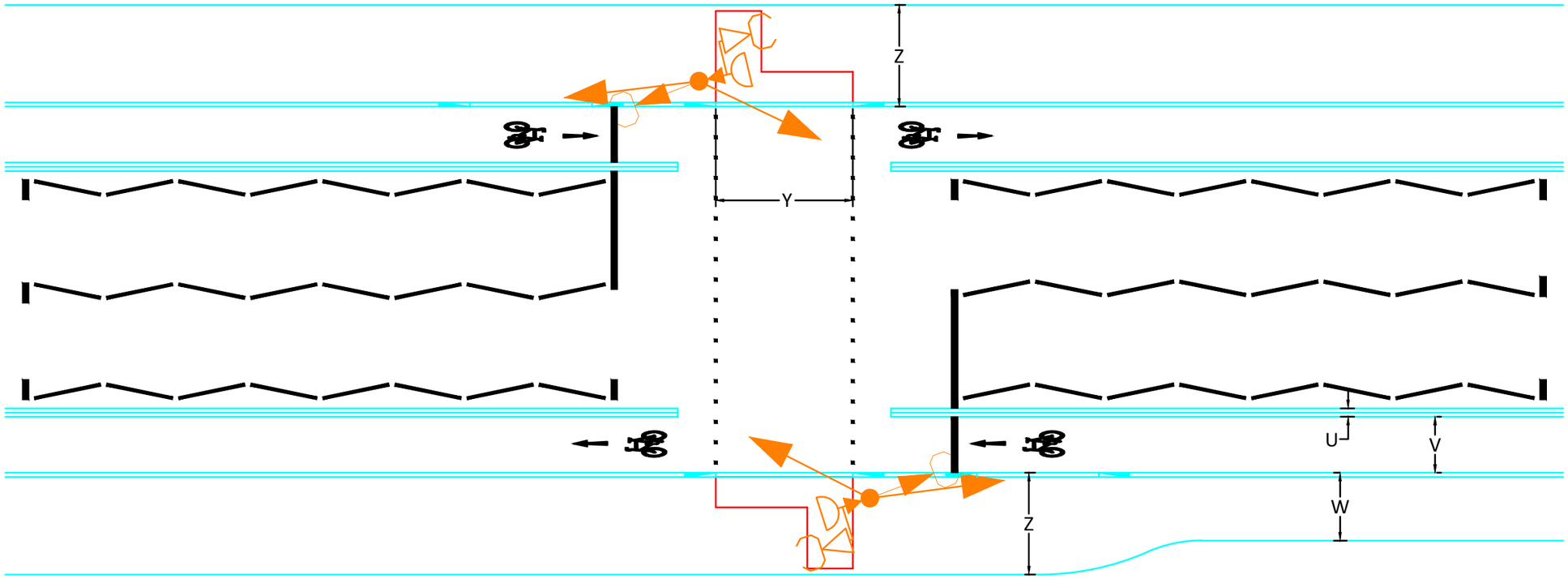
A.8



Parameter	Desirable Minimum	Absolute Min
U	0.6m	0.25m
V	2.0m	1.65m 1.5m if r>15m
W	2.0m	1.8m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
Traffic signal detection omitted for clarity.
Left hand poles optional.

1:200 0 1 2 3 4 5 6 7 8 9 10 11 12 metres

Toucan Crossing Standard Detail

1-way cycle lane signalised

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
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XREFS			REV
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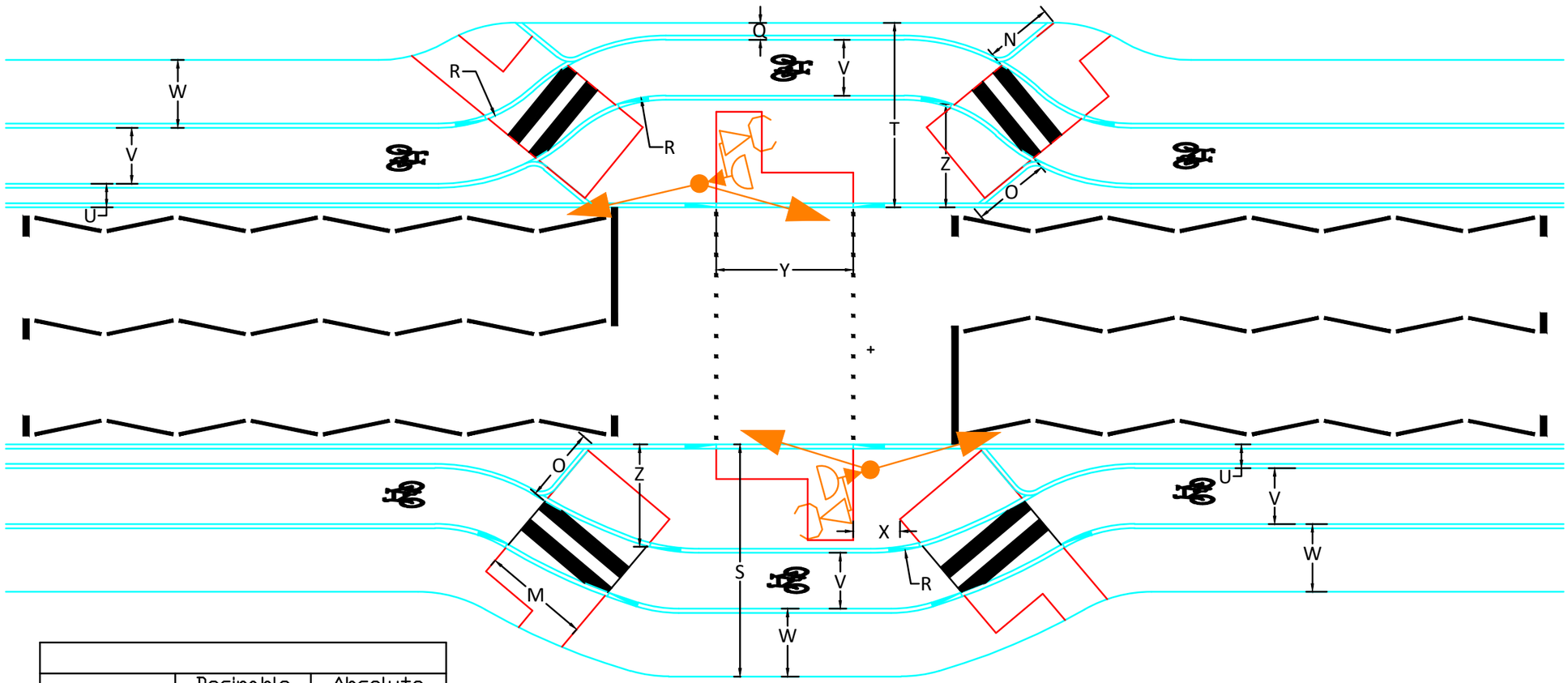
A.9



Parameter	Desirable Minimum	Absolute Min
M	3.6m	2.4m
N	2.5m	2.0m
O	3.0m	2.5m
Q	0.5m	0.25m
R	4.0m	3.0m
S	7.15m	6.45m
T	5.65m	4.9m
U	0.8m	0.5m
V	2.0m	1.65m 1.5m If r>15m
W	2.0m	1.8m
X	0.6m	0.3m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
South side full footway bypass.
North side no footway bypass.
Traffic signal detection
omitted for clarity.
Left hand poles optional.

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Toucan Crossing Standard Detail

1-way cycle track by-pass

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
DRAWN BY	EG	CHCKD BY	RB
FILENAME	Toucan Standard Details.dwg		
XREFS			REV
DWG No.	A4/Toucan/1-way/TSD5		-

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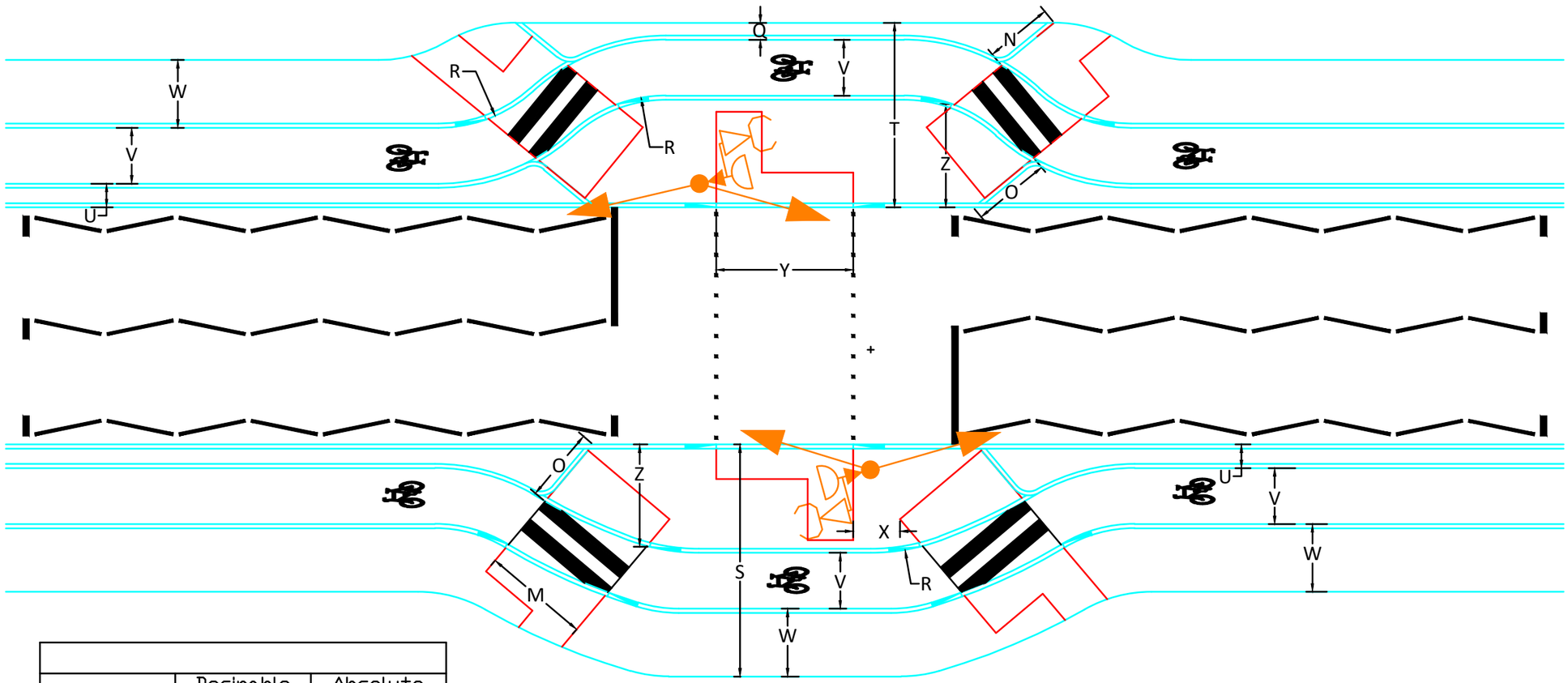
A.9



Parameter	Desirable Minimum	Absolute Min
M	3.6m	2.4m
N	2.5m	2.0m
O	3.0m	2.5m
Q	0.5m	0.25m
R	4.0m	3.0m
S	7.15m	6.45m
T	5.65m	4.9m
U	0.8m	0.5m
V	2.0m	1.65m 1.5m If r>15m
W	2.0m	1.8m
X	0.6m	0.3m
Y	4.5m	3.0m
Z	4.5m	3.0m

Notes:
South side full footway bypass.
North side no footway bypass.
Traffic signal detection
omitted for clarity.
Left hand poles optional.

1:200 metres 0 1 2 3 4 5 6 7 8 9 10 11 12

Toucan Crossing Standard Detail

1-way cycle track by-pass

SUBDISTRICT			
OS_REF		STATUS	Approved
DATE	April 2020	CDB APPROVED	14-05-20
DRAWN BY	EG	CHCKD BY	RB
FILENAME	Toucan Standard Details.dwg		
XREFS			REV
DWG No.	A4/Toucan/1-way/TSD5		-

Transport for Greater Manchester
Urban Traffic Control Unit
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email: gmutc@tfgm.com

Appendix B

Bee Network Crossing Selection Tool: User Guidance

Purpose of the Tool

The Crossing Selection Tool (CST) is intended to assist the designer in selecting the best crossing for pedestrians and cyclists in the typical scenario in which a Bee Network route approaches a major road on quiet side streets to either side, and a method of crossing both pedestrians and cyclists from one side street to the other is required.

The over-riding principle is that sharing space between pedestrians and cyclists, or cyclists and busy motor traffic, should be avoided. Solutions involving either should only be used as a last resort when all other available options have been examined and found to be undeliverable. Justification of any such mixing, using this tool, will be required as part of scheme business cases for schemes funded through GMCA.

Instructions for Use

The main element of the CST is a flow chart which asks the designer to select the characteristics of the location, based on 2 key criteria (blue boxes):

- Whether the two side roads to be linked are opposite each other, or whether there is a 'dog-leg' – either right-left, or left-right
- The level of traffic flow on the major road to be crossed

Based on the designer's selections, the tool will provide a range of solutions, grouped by the method of provision for cyclists: in some cases cyclists will be provided for on an off-carriageway cycle track, in others on carriageway without signal control, and in others by signalising the junction and cyclists remaining in the carriageway. In each scenario a range of at least 4 possible solutions which are fully compliant LTN 1/20 will be provided (green boxes), followed by at least 1 solution which is not fully compliant with LTN 1/20 (usually because it entails some element of shared space for pedestrians and cyclists, or requires cyclists to mix with busy motor traffic).

All compliant (green) solutions must be examined. In most cases at least one of these solutions will prove possible. If none are found to be deliverable at any given location, only then can one of the amber options listed be considered. Justification for the selection of one of the amber options (also designated by a 'j' suffix (for 'justification') in the reference number) must be provided as part of the scheme Full Business Case for any scheme funded in whole or part by GMCA.

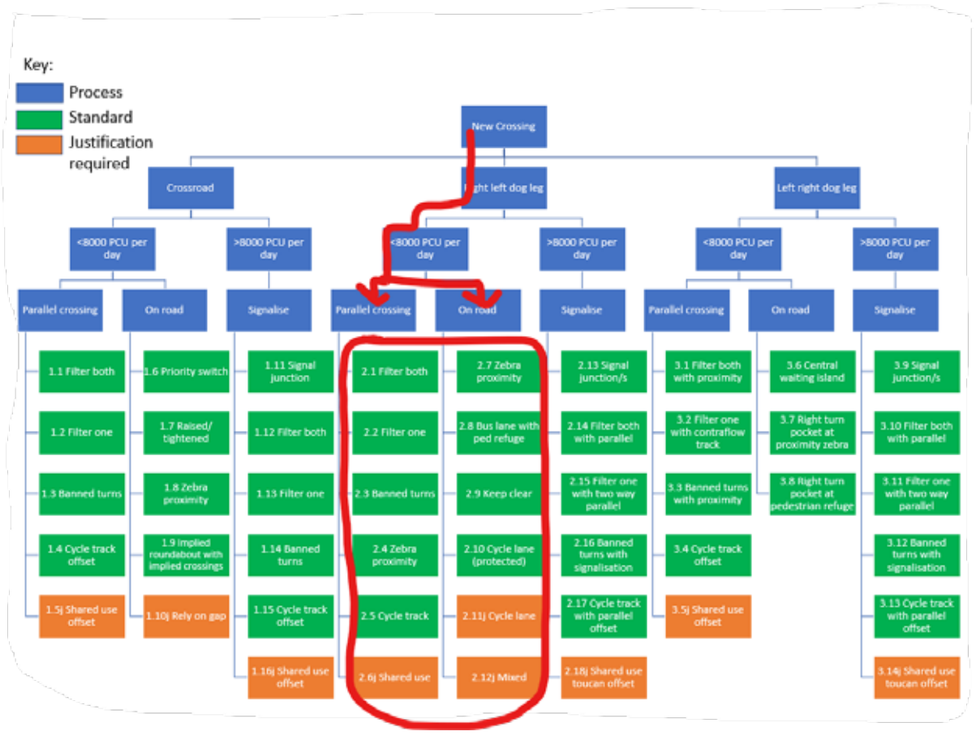
The flow chart is supported by a series of schematic diagrams which illustrate each of the crossing types shown in the flow chart. A reference number system is provided to ensure ease of reference between the flow chart and the diagrams. Where there are known examples of a particular crossing solution within the UK, a geo-referenced link to a location of each crossing example is provided adjacent to each schematic diagram to further aid the designer

It is important to note the following points regarding the suggested solutions:

- The green solutions are not presented in order of preference – i.e. option 1.1 is not necessarily preferable to 1.2, for example. All green options in any given column provide the level of service required for pedestrians and cyclists on the Bee Network.
- Options within the tool are not absolute in their design criteria. Elements of some options could be combined with elements of others in order to create a design solution that works in any given local circumstance. The tool is intended to generate ideas from which compliant design solutions can be created for specific locations.
- The geo-referenced links are provided to aid the design process and to show how examples can work in a 'real-world' scenario. Not all the examples show precisely the configuration shown in the schematic example due to local scheme-specific variation.

Worked example

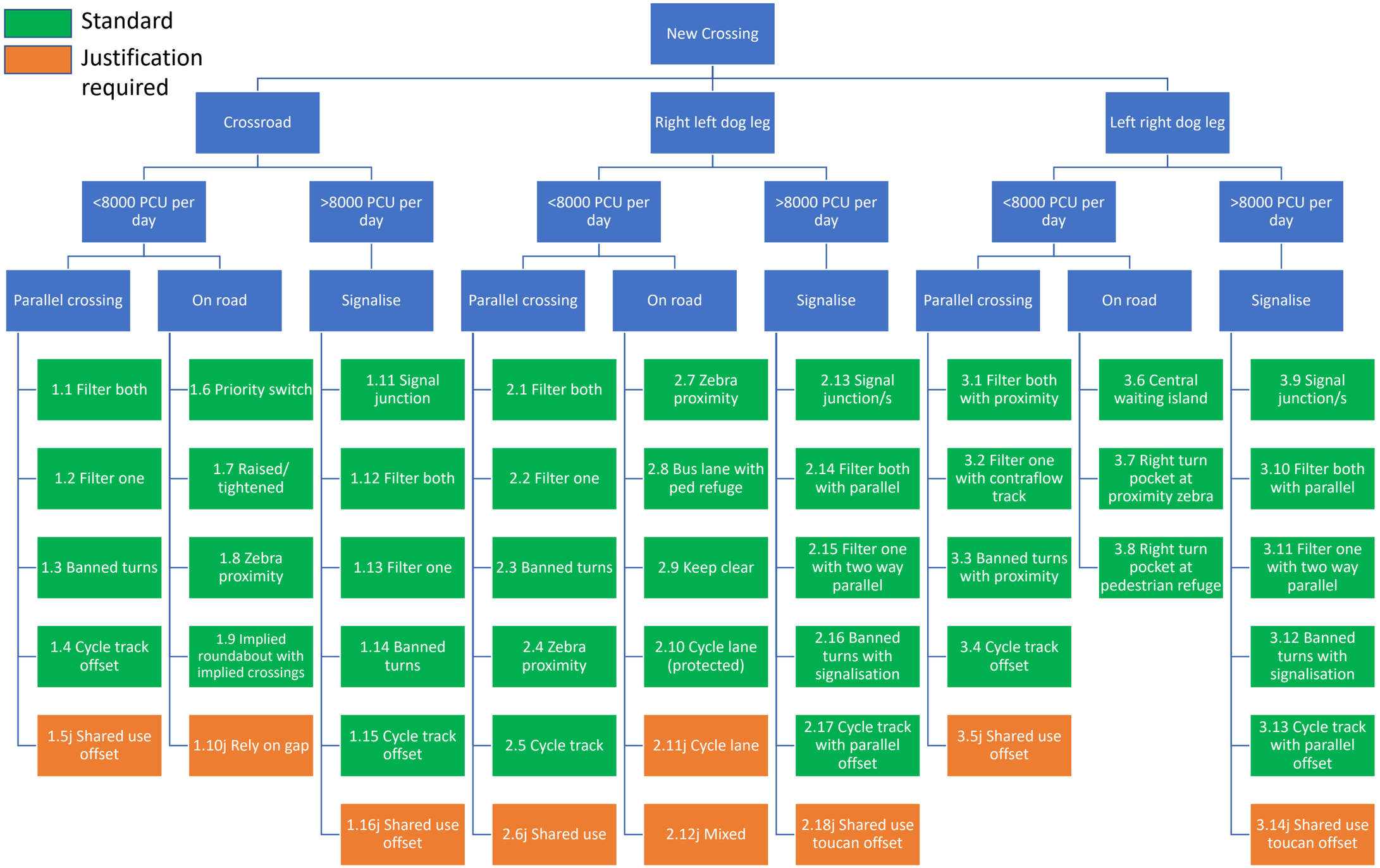
1. A designer is selecting a crossing type for a location where the two side roads are in a right-left dog leg configuration (i.e. where the cyclist would need to first turn right onto the main road, and then left off it)
2. The road to be crossed carries fewer than 8,000 PCUs per day
3. Based on the above inputs, the CST provides nine potential compliant solutions (2.1-2.5 and 2.7-2.10)
4. Due to space constraints and it being impossible to filter or ban turns due to local access route considerations, most compliant options are ruled out
5. However, there is space on the road to be crossed to provide short lengths of protected cycle lane to enable cyclists to make the crossing. This option (2.10) is selected. Had this not been possible, then the designer would have been justified in selecting one of the amber options available (2.6j, 2.11j or 2.12j).



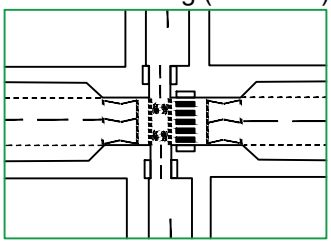
Greater Manchester Interim Active Travel Design Guide

Greater Manchester Interim Active Travel Design Guide

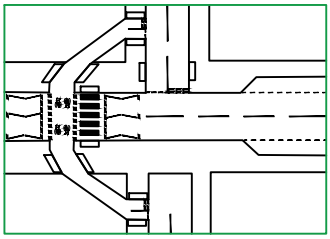
Appendix B: Bee network crossing selection tool



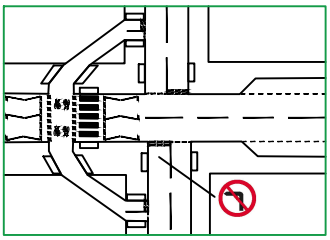
1.1 Crossroad: Link
Parallel crossing (filter both)



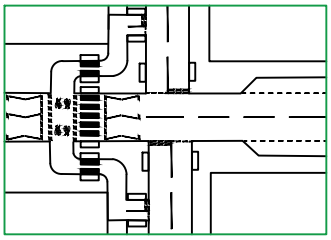
1.2 Crossroad: Link
Parallel crossing (filter one)



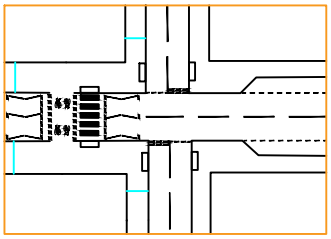
1.3 Crossroad: Link
Parallel crossing (banned turn)



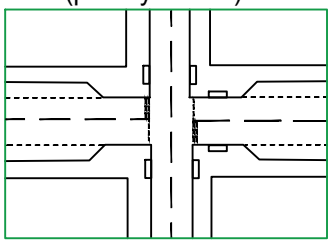
1.4 Crossroad: Link
Parallel crossing (cycle track)



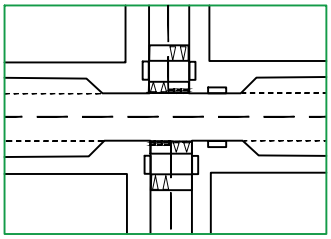
1.5j Crossroad: Link
Parallel crossing (shared use)



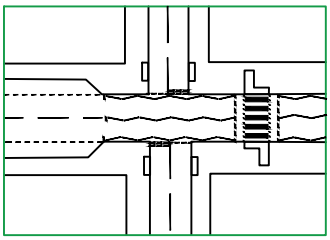
1.6 Crossroad: Link On road (priority switch)



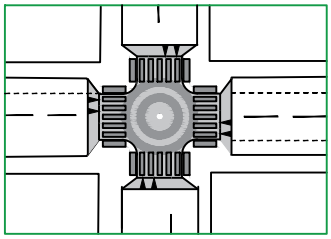
1.7 Crossroad: Link
On road (treated)



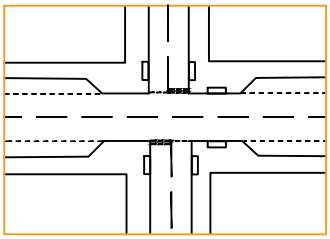
1.8 Crossroad: Link
On road (proximity)



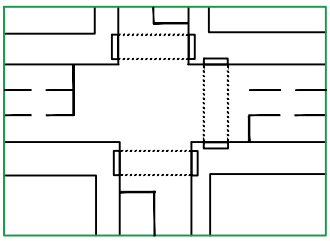
1.9 Crossroad: Link
On road (implied rdbt)



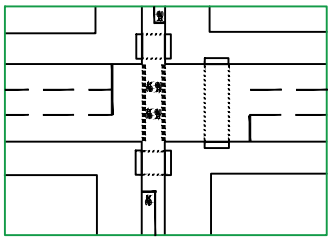
1.10j Crossroad: Link
On road (rely on gap)



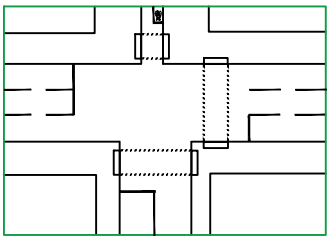
1.11 Crossroad: Link
Signalise (signal junction)



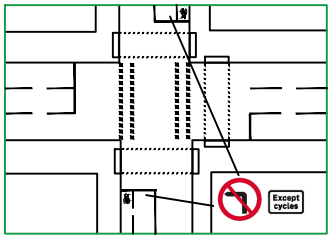
1.12 Crossroad: Link
Signalise (filter both)



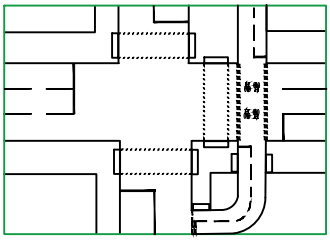
1.13 Crossroad: Link
Signalise (filter one)



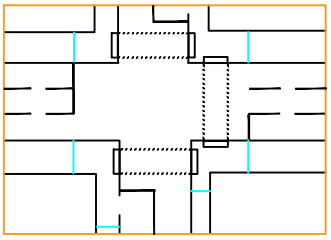
1.14 Crossroad: Link
Signalise (banned turns)



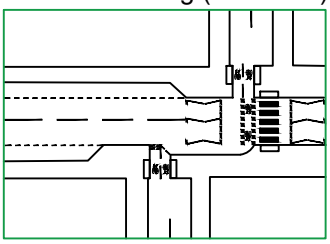
1.15 Crossroad: Link
Signalise (cycle track)



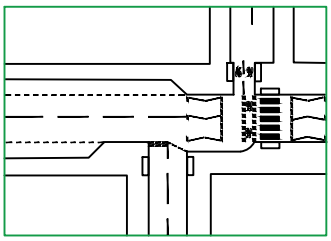
1.16j Crossroad: Link
Signalise (shared use)



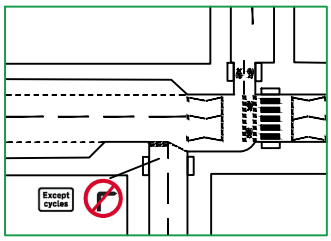
2.1 Right left dog leg: Link
Parallel crossing (filter both)



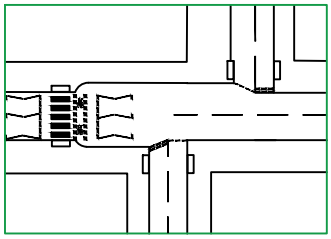
2.2 Right left dog leg:Link
Parallel crossing (filter one)



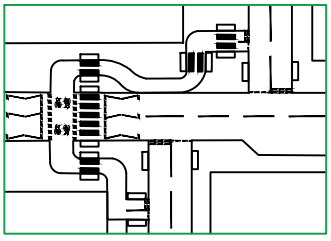
2.3 Right left dog leg:Link
Parallel crossing (banned turn)



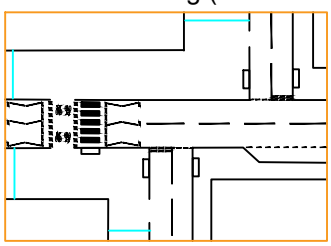
2.4 Right left dog leg:Link
Parallel crossing (proximity)



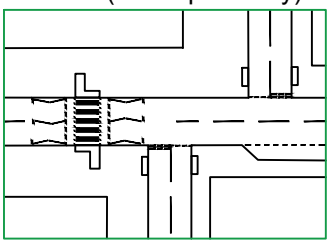
2.5 Right left dog leg:Link
Parallel crossing (cycle track)



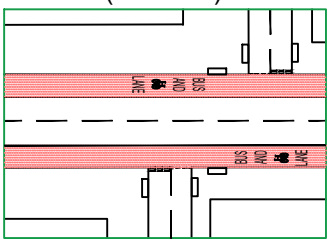
2.6j Right left dog leg:Link
Parallel crossing (shared use)



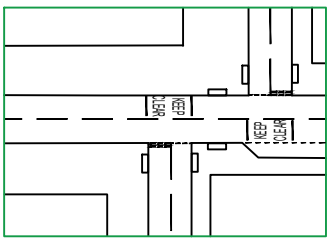
2.7 Right left dog leg:Link
On road (zebra proximity)



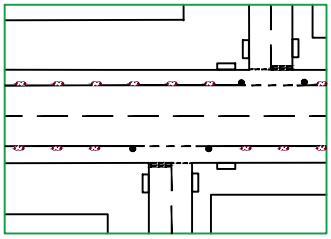
2.8 Right left dog leg:Link
On road (bus lane)



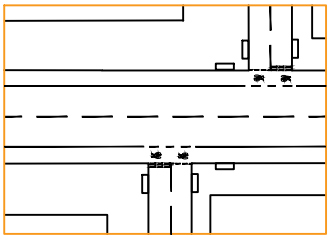
2.9 Right left dog leg:Link
On road (keep clear)



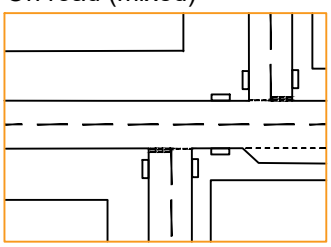
2.10 Right left dog leg:Link
On road (protected lane)



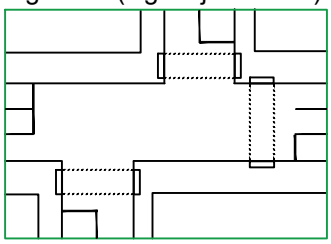
2.11j Right left dog leg:Link
On road (cycle lane)



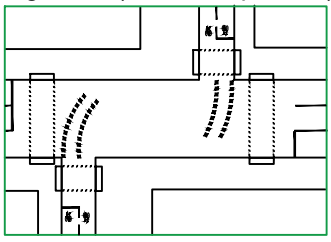
2.12j Right left dog leg:Link
On road (mixed)



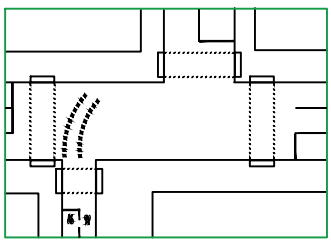
2.13 Right left dog leg:Link
Signalise (signal junction/s)



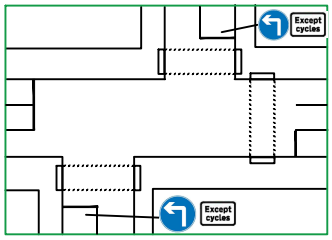
2.14 Right left dog leg:Link
Signalise (filter both parallel)



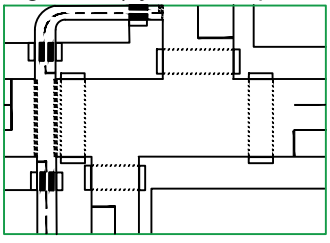
2.15 Right left dog leg:Link
Signalise (filter one parallel)



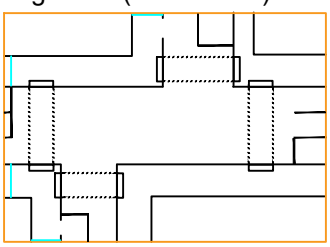
2.16 Right left dog leg: Link
Signalise (banned turns)



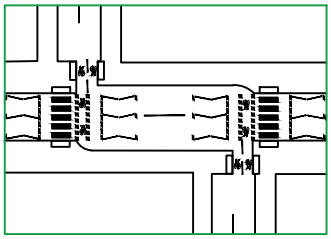
2.17 Right left dog leg:Link
Signalise (cycle track parallel)



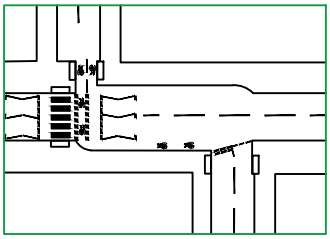
2.18j Right left dog leg:Link
Signalise (shared use)



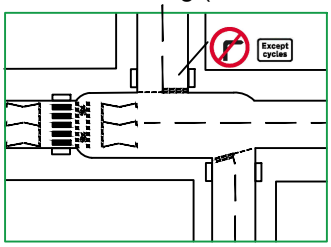
3.1 Left right dog leg:Link
Parallel crossing (filter both)



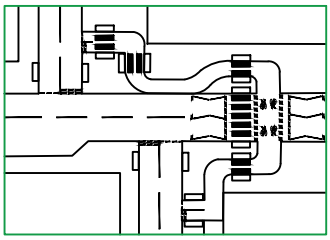
3.2 Left right dog leg:Link
Parallel crossing (filter one)



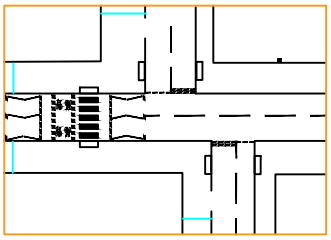
3.3 Left right dog leg:Link
Parallel crossing (banned turn)



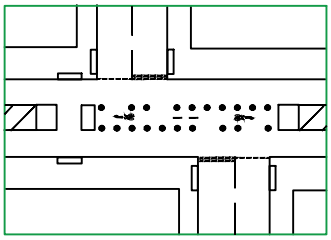
3.4 Left right dog leg:Link
Parallel crossing (cycle track)



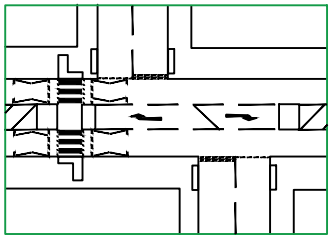
3.5j Left right dog leg:Link
Parallel crossing (shared use)



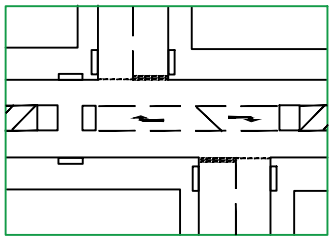
3.6 Left right dog leg:Link
On road (central waiting island)



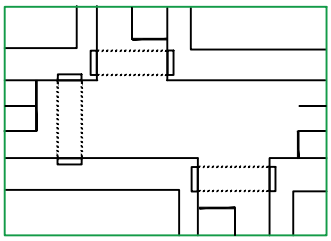
3.7 Left right dog leg:Link
On road (pocket with proximity)



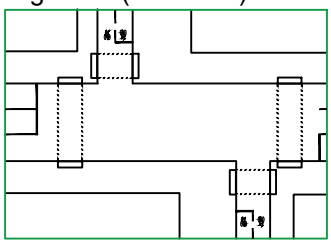
3.8 Left right dog leg:Link
On road (pocket at refuge)



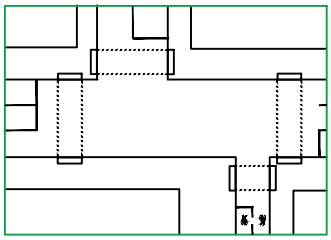
3.9 Left right dog leg:Link
Signalise (signal junction)



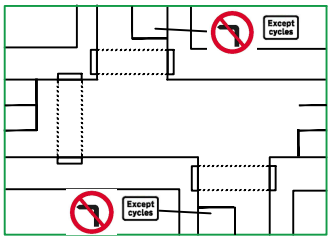
3.10 Left right dog leg:Link
Signalise (filter both)



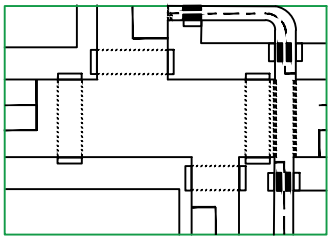
3.11 Left right dog leg:Link
Signalise (filter one)



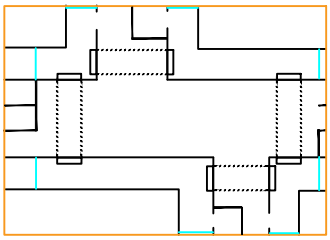
3.12 Left right dog leg:Link
Signalise (banned turn)



3.13 Left right dog leg:Link
Signalise (cycle track)



3.14j Left right dog leg:Link
Signalise (shared use)



GMCA GREATER MANCHESTER COMBINED AUTHORITY

Transport for Greater Manchester