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Greater Manchester Cycling Design Guidance & Standards

Version 2.0

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Version No.	Comments	Prepared by	Issue Date	Reviewed by
1.0	Initial Draft prepared by AECOM (Phase 1)	NB / PH (AECOM)	30-Aug-13	ALB / NV (TfGM)
1.1	Amendments following comments from ALB and NV of TfGM	NB / PH (AECOM)	06-Sept-13	ALB / NV (TfGM)
2.0	Amendments following wider consultation	NB / PH (AECOM)	21-Jan-14	NV (TfGM)

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1 Introduction

1.1 Context

Transport for Greater Manchester has aspirations to secure at least a 300% increase in the levels of cycling across the city region by 2025. This will be achieved through the Vélocity 2025 programme which aims to deliver a cycling culture and infrastructure across Greater Manchester that will make cycling a mainstream, everyday and aspirational form of transport for all, regardless of age or ability. The first phase of the Vélocity programme consists of investment in a number of key routes and interchanges, supplemented through the recently awarded Cycle City Ambition Grant (CCAG) funding from the Department for Transport.

To ensure consistent and high quality implementation of cycling infrastructure as part of the Vélocity 2025 programme, this Greater Manchester Cycling Design Guidance and Standards document (hereafter GMCDGS) has been developed in collaboration with the Greater Manchester District Authority partners. It is recognised that the GMCDGS will be a "live" document, extended and updated as required and made available in electronic format.

1.2 Key Design Criteria

As widely stated across a range of cycling design guidance, the key design criteria for successful and effective cycling infrastructure are safety, coherence, directness, attractiveness and comfort. In the context of Vélocity 2025, elaboration on these key design criteria is provided below:

- ***Safety*** – cycling infrastructure must cater for all age groups (ages 8-80) and the full range of cycling abilities. To achieve this 'Family Network', the Vélocity aspiration is therefore to provide **largely segregated** cycle facilities whereby cyclists are separated from other road users. Safety considerations include ensuring that new cycling infrastructure does not adversely affect pedestrians, in particular vulnerable pedestrians such as those with mobility impairment.
- ***Coherence*** – the cycle route must be easy to find and intuitive to navigate; be consistent in quality; and offer route continuity and completeness. The need for route completeness can be likened to the approach adopted for public transport systems. For example, at a pinch-point, the LRT track cannot simply stop and re-start beyond; it has to be continuous. For the same reason, it is not acceptable to leave gaps in cycle route provision. Where available highway widths are restricted for short sections, the objective should be to maintain the cycle facility, potentially through localised widening. Road signs such as "Cyclists Dismount" or "End" of cycle lane should not be used. Provision of high quality and continuous cycle routes with effective way-finding creates a "No Excuses Zone" for catchment populations within reasonable cycling distances to consider cycling a practical and viable mode of transport.
- ***Directness*** – the cycle facilities must be direct in terms of both distance and time. Cycle routes need to serve key desire lines, connecting origins to destinations end-to-end without significant detour or delay.

- ***Attractiveness*** – the cycling environment along a route should be pleasant and interesting to encourage the full range of cyclists including beginners, recreational cyclists and commuter cyclists. Furthermore, there should be good levels of natural surveillance and, where appropriate, street lighting in order to promote personal safety.
- ***Comfort*** – cycling infrastructure should be designed, built and maintained for ease of use and for comfort. This means application of high quality surface treatment and seeking to minimise the number of times it is necessary to stop or conflict with other road users.

Practitioners need to ensure that design decisions aimed at addressing one design principle do not have an unduly negative impact on the others. For example, the most convenient route might not always be the safest option, or an attractive route could involve such detours as to make it relatively inaccessible.

1.3 Quality of Service Philosophy

Quality of Service (QoS) is a measurement of the degree to which the needs of the cyclist are met, assessed against the five key design criteria described above. In other words it describes the quality of the cycling environment / infrastructure provision. A high QoS rating will better meet the five needs of the cyclist along a route corridor.

Deploying this QoS assessment methodology provides a consistency in approach when reviewing cycle routes across the Greater Manchester region. Making use of a simple A-E grading system also aids understanding and helps to communicate the quality of cycle infrastructure provision to a wide audience.

A full QoS assessment framework will be developed for use by practitioners. It is likely that routes will be divided into sections and scored, with an average score developed for the route as a whole. Reflecting the vision for a step change in cycling provision across Greater Manchester as set out in the Velocity 2025 Cycling Plan, the QoS aspirations for the ‘primary’ and ‘local’ cycle networks across the region are summarised in the table below:

Table 1: Quality of Service Target Grading

Network	Description	Target QoS Grading (Route Average)
Primary	Main cycle arteries that cross the urban area and carry most cycle traffic	A or B
Local	Cycle routes within local zones and/or connections to the Primary cycle route network	C or above

The QoS methodology can be used to record the level of change between existing provision and the proposed cycle route improvement schemes, and/or to compare different scheme options.

1.4 Design constraints

It is recognised that the core design principles set out above are challenging to achieve given a number of real world design constraints including:

- Cost
- Acceptability (public and political)
- Congestion impact on other road users
- Deliverability (given the compressed CCAG timescales)
- Available width within existing highway boundaries
- Enforcement difficulties
- Maintenance liability.

In instances where site-specific constraints make it difficult to achieve the desirable design characteristics, the designer is encouraged to explore alternative means of achieving consistent and continuous cycle facilities along the route, perhaps by managing vehicular demands or identifying potential re-routing opportunities. Such interventions could include (but are not limited to):

- Reduce vehicle capacity by removing vehicular lanes in order to increase available highway width for cyclists
- Limit use by large vehicles in order to achieve narrow lane running for general traffic
- Remove or relocate parking and loading bays
- Inset bus stops
- Make links one-way
- Alter or narrow footway configurations as appropriate
- Introduce shuttle working
- Reduce vehicle speeds such that links can be reclassified and require reduced cycling infrastructure
- Consider mixing provision along a given link such that it transitions between different cycle link types as appropriate.

1.5 Design Opportunities

Vélocity 2025 provides a real opportunity to embrace innovation in design of cycling infrastructure across Greater Manchester in order to satisfy the core design principles and to achieve a step-change in provision. Examples of innovation currently being considered or trialled elsewhere in the UK include:

- deploying different types of segregated lane separators including Jislon Wands (previously used on the Olympic lanes); Zicla Zebra 9 units, sometimes known as Armadillos, (an 820mm long Spanish product made from 100% recycled PVC as recently used in Camden); and kerbs with a hard margin
- the use of ‘rumble strip’ thermoplastic lines to increase awareness of cycle lane markings

- the introduction of separate cycle signals with cycle logos at signalised junctions to provide cyclists with an ‘early start’ phase, potentially sited at low level (as widely used in Europe) in order to provide signals closer to cyclists' eye-level
- installation of blind spot cycle safety mirrors at key locations where cyclist to vehicle visibility is poor, in particular with Heavy Goods Vehicles
- ‘Dutch style’ roundabouts with a tighter geometry to reduce vehicles speeds and improve visibility and, where appropriate, an orbital cycle lane enabling cyclists to travel around the roundabout separately to other traffic
- Cycle detection using Intelligent Transport Systems in order to improve collection of valuable monitoring data.

It is recognised that currently several of the above examples of innovation are likely to require special authorisation from DfT. However, the ongoing review of the TSRGD together with the potential commencement of Part 6 of the Traffic Management Act (TMA) 2004 may provide Local Authorities with more autonomy and powers of enforcement in the future. This may include, for example, allowing better enforcement of cycle lanes and advanced stop lines, thereby further improving cycle safety.

As part of their response to the All Party Parliamentary Cycling Group’s *Get Britain Cycling* report, the Department for Transport are actively trialling innovative new measures for cyclists such as allowing separate traffic signals for cyclists ,and are progressing with approving and updating necessary new regulations, including implementing Part 6 of the TMA.

1.6 Purpose of this document

The purpose of the GMCGDS is to promote consistency of provision across the city region. As with any guidance, it can only offer generic layouts; it is a not a panacea and cannot provide solutions for the range of site specific design challenges that occur in the real world. As such, the onus remains on the designer to make best use of the guidance to achieve high quality cycling infrastructure with due consideration to the needs of other road users.

1.7 Layout of this document

The remainder of this document is divided into the following chapters:

- **Chapter 2** – information on the different options for cycle link facilities together with a brief guidance on cycle route features including bus lanes bus stops and parking bays
- **Chapter 3** – summary guidance regarding priority junctions, signalised junctions and informal and formal crossing facilities
- **Chapter 4** – statutory and informatory signing and markings
- **Chapter 5** – general construction guidance including surfacing.

At the end of this document there are a number of appendices as follows:

- **Appendix A** – References and bibliography
- **Appendix B** – Geometric Standards
- **Appendix C** – Construction Cost Estimates Look-up Table
- **Appendix D** – Cycle Parking Standards
- **Appendix E** – Design Guidance and Standards Summary Sheets

The Design Guidance and Standards Summary Sheets contained in **Appendix E** contain a variety of information including cross-section and plan views, target and minimum dimensions, and a list of key criteria for the various link types. These Summary Sheets are intended to offer designers a one-page quick reference guide for a range of different cycle facilities. However, they should not be considered an exhaustive list; indeed, there are many situations that are not represented. Nevertheless, the Summary Sheets do provide a starting point for the designer and it is intended that the principles contained therein can be used to develop designs for sites that are not directly represented.

As previously stated, it is recognised that the GMCDGS will be a “live” document, extended and updated with additional sections and specific guidance as required.

2 Links

2.1 Introduction

A key objective of Vélocity 2025 cycle programme is to create “an integrated and strategically planned network of dedicated, high-quality, newly built or enhanced cycling routes that will be **largely segregated** from other traffic wherever possible”.

The challenge for designers across the Greater Manchester Authorities is therefore to work towards this end goal, starting with the early schemes funded through the CCAG funding.

This chapter contains a range of information to assist designers when considering different link solutions for cyclists and should be read in conjunction with the respective Design Guidance & Standards Summary Sheets provided in **Appendix E** and referred to throughout this chapter as Summary Sheets.

2.2 Link Definitions

There are several distinct types of cycle link facility as defined in **Table 2**.

Table 2: Types of Cycle Link Facilities

Type of Link Facility	Definition
Cycle Track	Physically segregated (vertical barrier) from both motorised traffic and pedestrians. Can be constructed by reallocation of carriageway space or by new construction.
Cycle Lane	Segregated from pedestrians but not physically segregated from motorised vehicles along the full length of the cycle lane. Can be either Mandatory or Advisory. Option to include a buffer zone between the cycle lane and general traffic lane, possibly making use of intermittent physical segregation, sometimes referred to as ‘light segregation’.
Shared Use Footway/Cycleway	Cyclists share the footway with pedestrians. Can be segregated or unsegregated.
Quiet Street	Cyclists occupy the lane together with motorised traffic. Only recommended on low-speed (20mph), low-volume roads <7.0m carriageway width. No cycle lane markings, large cycle logos only.
Cycle Path	Separate from motorised traffic, but may be shared with pedestrians (e.g. Canal towpath).

Choice of a specific facility for any given link will depend on a number of factors including, but not limited to:

- available width
- projected levels of use by cyclists (plus related pedestrian and motorised traffic flows)
- interface with adjoining facilities and land uses
- cost and deliverability
- other site-specific elements.

2.3 Hierarchy of Provision

In considering design options for integrating cycle facilities into Greater Manchester's highway networks, there is no one hierarchy of solutions that is universally applicable. This reflects a variety of local constraints and requirements and problem sites for which bespoke solutions are required.

Notwithstanding the above, there is a recognised hierarchy of provision of cycle link facilities as quoted in a number of cycle design guidance documents and repeated below in **Figure 1**.

Figure 1: Hierarchy of Provision

Consider first	Traffic volume reduction
	Traffic speed reduction
	Junction treatment, hazard site treatment, traffic management
	Reallocation of carriageway space
	Cycle tracks away from roads
Consider last	Conversion of footways/footpaths to shared use for pedestrians and cyclists

Source: Local Transport Note 2/08

Where there is no realistic option to reduce general traffic flows and/or speeds and, in accordance with the core Vélocity 2025 objective of providing largely segregated cycle facilities to cater for the full range of cyclists, **cycle tracks or cycle lanes with a safety buffer should be considered first and provided where it is viable to do so**.

2.4 Flow/Speed Lookup Table

Guidance on the type of cycle link facility that may be appropriate given different speeds and traffic flows is provided in **Table 3**. It can be seen from Table 2 that Quiet Streets are appropriate when traffic flows and/or speeds are low, but where traffic flows and/or speeds are medium or high, then cycle tracks or cycle lanes are required.

Table 3: Flow/Speed Lookup Table

Flow	85th percentile speed			
	Very Low *(<20 mph)*	**Low** *(20 to 30 mph)*	**Medium** *(30 to 40 mph)*	**High** *(>40 mph)*
Very Low *(<1,500 vpd, or 150 vph)*	Quiet Street	Quiet Street	Cycle lanes	Cycle lanes or tracks
Low *(1,500-3,000 vpd, or 150-300 vph)*	Quiet Street	Quiet Street or Shared Use	Cycle tracks or lanes	Cycle lane or tracks
Medium *(3,000-8,000 vpd, or 300-800 vph)*	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks
High *(8,000-10,000 vpd, or 800-1,000 vph)*	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks
Very High *(> 10,000 vpd)*	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks or lanes	Cycle tracks

Source: Adapted from London Cycle Design Standards (TfL, 2005)

Notes:

1. vpd = number of motor vehicles in a 24 hour weekday.
2. vph = typical number of motor vehicles in a typical morning peak hour.
3. Where traffic speed/flow is low, the designer should aim to avoid the use of signs or markings specifically for cyclists.
4. Cycle lanes used in the higher speed/flow situations should provide good separation between cyclists and motorists. Wide cycle lanes or hatching can help here.
5. In congested areas, cycle lanes can be useful even when traffic speed is low.

Other factors relating to the provision of on-road or off-road cycle link facilities are listed in **Table 4**.

Table 4: Type of cycle facility

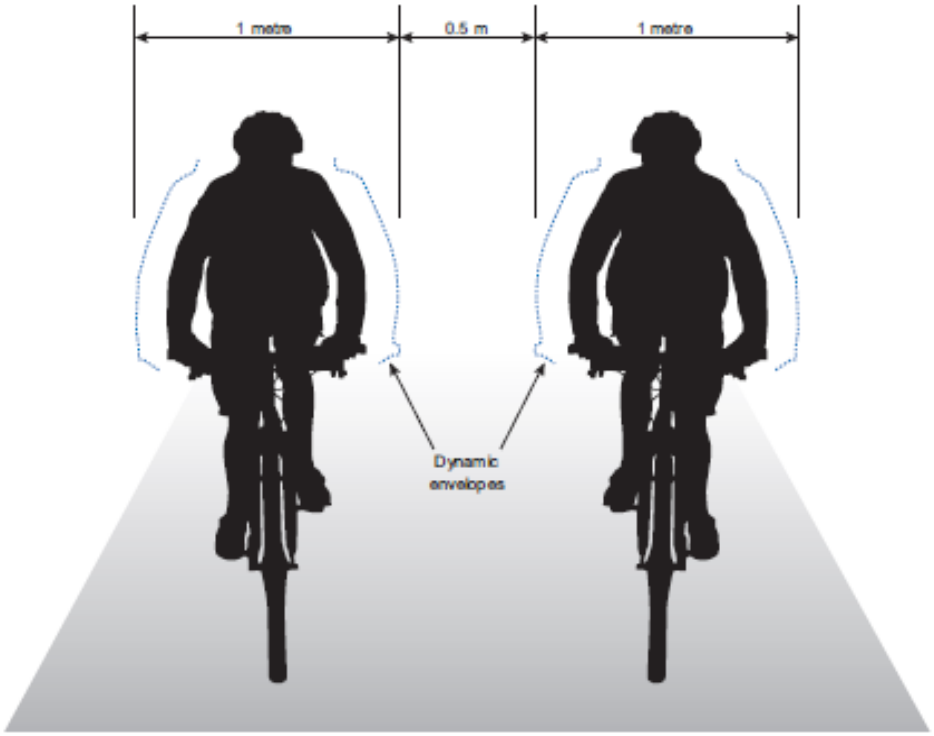
Factor	On-road or off-road?
High traffic volume/speed routes	Off-road generally preferred, but see next item
Large number of side road junctions or property accesses along route	Make on-road more attractive, as it reduces the potential for conflict at these locations
Busy pedestrian traffic along the route	On-road preferred, as it reduces the potential for conflict
High levels of on-street parking	Makes on-road less attractive, but needs careful consideration in view of the potential for increased conflict using off-road provision
High levels of HGV traffic	

Source: Local Transport Note 2/08

2.5 Width Requirements

When designing cycle facilities, it is important to consider the dynamic envelope of cyclists that is the width required including the 'wobble-factor'. This will vary according to the speed of the cyclist, and is discussed in detail in Section 2 of LTN 2/08. Allowing for the wobble-factor and a 0.5m separation between cyclists, **Figure 2** illustrates a 2.5m dynamic envelope for two side-by-side cyclists.

Figure 2: Dynamic Envelope



Source: Local Transport Note 2/08

Target widths for different cycle links facilities on roads with a speed limit of 30mph or less are provided on the respective Summary Sheets contained in **Appendix E**. On faster roads where the 85th percentile speed of traffic exceeds 30mph, the absolute minimum width should not be used and segregation between cycles and motorised traffic should be provided.

Details of Target, Desirable Minimum and Absolute Minimum widths for various types of cycle link facilities are shown in **5** and arranged in descending order of highway width required in **6**.

The absolute minimum general traffic lane width is 3.0m on roads subject to a 30mph speed limit. On faster roads, bus routes, or on roads where HGV levels exceed 8% of all traffic, this should be increased to 3.25m. Where the 85th percentile speed of traffic exceeds 30mph and there is insufficient width to provide the prescribed greater lane width of 3.25m, measures should be developed to reduce speeds to 30mph or less (see **Table 7**).

Table 5: Width requirements for different cycle link facilities

	Footway	Cycle Facility	Buffer	Traffic Lane	Half Width[6]	Full Width[6]
CYCLE TRACK (1-way)						
Target	**>2.0m**	**2.5m**	**>0.5m**	**3.5m**	**>8.5m**	**>17m**
Desirable min	2.0m [1]	2.0m	0.5m	3.25m	7.75m	15.5m
Absolute min	1.8m [2]	1.5m [3]	0.5m	3.0m [4]	6.8m	13.6m
CYCLE TRACK (2-way; on one side of the road only)						
Target	**>2.0m**	**4.0m**	**>0.5m**	**3.5m**	**>10.0m**	**>15.5m**
Desirable min	2.0m [1]	3.0m	0.5m	3.25m	8.75m	14.0m
Absolute min	1.8m [2]	2.0m [3]	0.5m	3.0m [4]	7.3m	12.1m
HYBRID (TERRACED) CYCLE TRACK						
Target	**>2.0m**	**2.5m**	**0**	**3.5m**	**>8.0m**	**>16.0m**
Desirable min	2.0m [1]	2.0m	0	3.25m	7.25m	14.5m
Absolute min	1.8m [2]	1.5m [3]	0	3.0m [4]	6.3m	12.6m
CYCLE LANE						
Target	**>2.0m**	**2.0m**	**0.7m**	**3.5m**	**>7.5m**	**>15.0m**
Desirable min	2.0m [1]	1.5m	0.6m	3.25m	6.75m	13.5m
Absolute min	1.8m [2]	1.2m [3]	0.5m	3.0m [4]	6.0m	12.0m
SHARED FOOTWAY/CYCLEWAY (segregated)						
Target	**>5.0m**		**>0.5m**	**3.5m**	**>8.5m**	**>17.0m**
Desirable min	5.0m [1,2]		0.5m	3.25m	8.25m	16.5m
Absolute min	4.0m [3]		0.5m	3.0m [4]	7.0m	14.0m
SHARED FOOTWAY/CYCLEWAY (unsegregated)						
Target	**>3.0m**		**>0.5m**	**3.5m**	**>6.5m**	**>13.0m**
Desirable min	3.0m [1]		0.5m	3.25m	6.25m	12.5m
Absolute min	2.5m [2,3]		0.5m	3.0m [4]	5.5m	11.0m

Notes:

1. Effective width subject to pedestrian flow
2. Localised narrowing due to street furniture permitted
3. For low cycle demand (<100/day), over short distances <100m, not on gradients >7%
4. See for minimum general traffic lane widths
5. Buffer required if >30mph. May be on carriageway hatching or on footway verge if cycleway is off-carriageway
6. Half widths and full widths refer to minimum total width required, building line to centre line and building line to building line respectively

Table 6: Cycle Link Facilities ordered by required Highway Width

Cycle Link Facility	Dimension Rating	Half Width[1]	Full Width[1]
Cycle Track (1-Way)	Target	>8.5m	>17m
Shared Footway/Cycleway (Segregated)	Target	>8.5m	>17.0m
	Desirable min	8.25m	16.5m
Hybrid Terraced Cycle Track	Target	>8.0m	>16.0m
Cycle Track (2-Way, one side of the road)	Target	>10.0m	>15.5m
Cycle Track (1-Way)	Desirable min	7.75m	15.5m
Cycle Lane	Target	>7.5m	>15m
Hybrid Terraced Cycle Track	Desirable min	7.25m	14.5m
Cycle Track (2-Way)	Desirable min	8.75m	14.0m
Shared Footway/Cycleway (Segregated)	Absolute min	7.0m	14.0m
Cycle Track (1-Way)	Absolute min	6.8m	13.6m
Cycle Lane	Desirable min	6.75m	13.5m
Shared Footway/Cycleway (Unsegregated)	Target	>6.5m	>13.0m
Hybrid Terraced Cycle Track	Absolute min	6.3m	12.6m
Shared Footway/Cycleway (Unsegregated)	Desirable min	6.25m	12.5m
Cycle Track (2-Way, one side of the road)	Absolute min	7.3m	12.1m
Cycle Lane	Absolute min	6.0m	12.0m
Shared Footway/Cycleway (Unsegregated)	Absolute min	5.5m	11.0m

Notes:

1 Half widths and full widths refer to minimum total width required, building line to centre line and building line to building line respectively.

Table 7: Minimum General Traffic Lane Widths

Speed (mph)	HGV %age or 2-way HGV flow/hr	2-way Vehicle flow/hr	Bus route?	Min Lane Width (m)
20	n/a	<120	n/a	2.75*
		≥120	N	3.00
			Y	3.25
30	n/a	<120	n/a	2.75*
	<8% or <60	<1,000	N	3.00
	<8% or <60	>1,000	n/a	3.25
	>8% or >60		n/a	3.25
>30	n/a	n/a	n/a	3.25

* On 2-way roads with carriageway width <5.5m, omit centre line marking

2.5.1 Providing for all types of Cyclist

When considering width dimensions, there is a need to make reasonable provision for all types of cyclist including adapted cycles for use by individuals with a disability. This includes, for example, ensuring cycle gaps are wide enough for trikes and recumbent bikes. Powered invalid carriages are not classed as motor vehicles for the purposes of road traffic legislation and they can be used on footways, footpaths, bridleways or pedestrianised areas, cycle tracks and in cycle lanes provided that appropriate orders are made.

2.6 Cycle Tracks

A Cycle Track is a section of the highway adjacent to, but not on the carriageway, that has been dedicated for use by cyclists. Cycle tracks are the preferred facility within the Vélocity network for the following reasons:

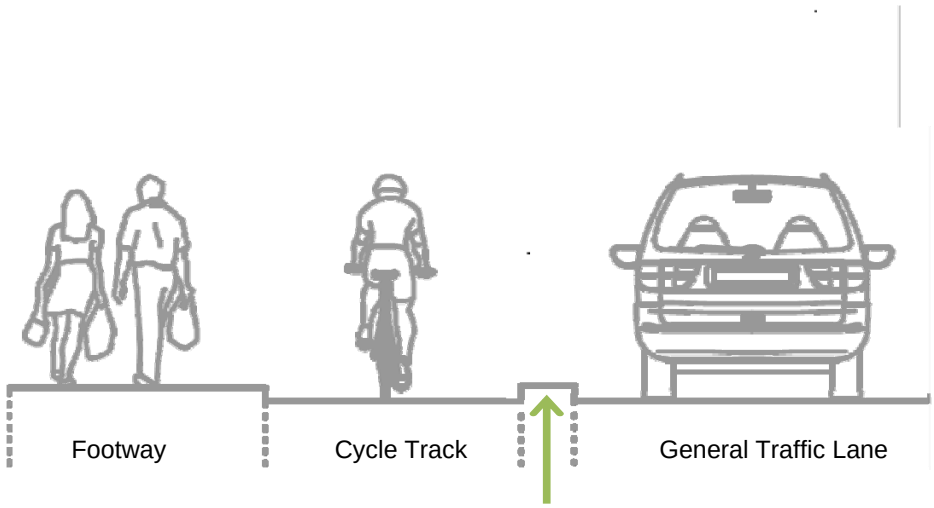
- They fully satisfy the key objective of providing cycling routes that are **largely segregated** from other traffic
- Because of the high level of segregation, they offer a safe route for cyclists of all abilities and confidence levels
- They provide a high profile facility that underlines Greater Manchester's commitment to cycling.

Two-way cycle tracks may be considered appropriate at certain locations. It is less expensive to construct a two-way cycle track on one side of the road than a one-way track on each side, and they may reduce the need for cyclists to cross busy roads in circumstances where trip generators such as schools, housing and retail are all on one side of a road. However, there are particular design issues to consider and resolve at transition points, where there are trip generators on both sides of the carriageway, and where two-way cycle tracks cross side roads. The solutions suggested in J-CT-GE-02 and 03 in **Appendix E** recommend taking the footway and cycle track across the side road at grade in order to increase the awareness of the cycle track crossing to drivers entering and leaving the side road.

If a two-way cycle track is being considered, it is also essential that particular attention be given to street lighting levels along its length to ensure its legibility to all road users.

A simple cross-section of a one-way cycle track is provided below as **Figure 3**. Interruptions to cycle tracks should be minimised in order to promote route continuity.

Figure 3: One-way Cycle Track



Safety Buffer (vertical barrier)

A more recent variation is referred to as a Hybrid Cycle Track. This adopts a terraced approach from footway to cycle track to carriageway as depicted in the example for Cambridge in **Figure 4** below.

Figure 4: Hybrid Terraced Cycle

Source: Local Transport Note 1/12

Summary Sheets relating to Cycle Tracks contained in **Appendix E** are listed below:

- L-CT-GE-1 One-way Cycle Track
- L-CT-GE-2 Two-way Cycle Track
- L-CT-HT-1 Hybrid Terrace Cycle Track

Additional Summary Sheets regarding the configuration of cycle tracks at junctions are also provided in **Appendix E**.

2.7 Cycle Lanes

2.7.1 Overview

Provision of cycle lanes:

- increases drivers' awareness of cyclists
- encourages drivers to leave space for cyclists
- legitimises overtaking (effectively undertaking) slow moving or stationery traffic
- encourages lane discipline by cyclists
- helps to confirm a route for cyclists
- can support motor traffic speed reduction (by reducing the apparent road width available to general traffic).

Source: Adapted from London Cycling Design Standards, Transport for London, 2009

Cycle lanes can be either mandatory or advisory, with further detail provided in Summary Sheets L-CL-GE-01 and L-CL-GE-02 respectively in **Appendix E**. To emphasise the presence of the cycle lane but without incurring the implementation cost and maintenance liability of full coloured surfacing, summary sheets L-CL-GE-01 and L-CL-GE-02 both show a narrow strip of colouring adjacent to the line marking. A similar approach is adopted to emphasise bus cages at bus stops across Greater Manchester.

General guidance relating to cycle lanes includes:

- Cycle lanes with associated road markings should be continued across side road junctions.
- It is essential that cycle lanes are located on the highway where cyclists want and need to be positioned.
- The target design width for a with-flow cycle lane is 2.0m. Such a width allows a cyclist to overtake a slow moving cyclist without leaving the cycle lane (or for two cyclists to ride side-by-side). Summary sheets L-CL-GE-01 and L-CL-GE-02 both indicate an absolute minimum width for cycle lanes of 1.2m. This minimum width dimension should only be used where the speed limit is 30mph or less; where there is a low cycle demand (less than 100 cycles per day); and over short distances (less than 100m) where carriageway width is constrained.
- Cycle lanes may require enforceable parking, waiting and loading restrictions.
- Mandatory cycle lanes should be provided in preference to advisory cycle lanes where practicable and appropriate. Mandatory cycle lanes should be replaced with advisory cycle lanes where other vehicles are permitted to cross the lane, such as at road junctions or adjacent to parking bays or bus stops. It is, however, legally permissible for a vehicle to cross a mandatory cycle lane to use a private access (with an associated exemption written into the Traffic Regulation Order), so there is no need to revert to an advisory cycle lane marking in such circumstances.
- Cycle lanes can be part of a route solution with other types of link facilities, but care must be taken to ensure appropriate interface and a sense of continuity of provision.

2.7.2 Creating a Buffer Zone

To accord with the key Vélocity 2025 objective of catering for all types of cyclists (8-80 year olds), where cycle lanes have been identified as the preferred solution, designers are encouraged to consider first all potential options which create a buffer zone between the cycle lane and general traffic lane in order to provide separation.

This buffer zone can take the form of hatch or chevron line markings (see summary sheet L-CL-GE-03 in **Appendix E**) or can include the provision of street furniture / physical barriers at intermittent intervals, sometimes referred to as '**light segregation**'. Advantages of adopting a light segregation approach (as opposed to full segregation with Cycle Tracks) include:

- Lower implementation cost
- Reduced construction time
- Better cycle access / permeability with cyclists able to enter and exit the cycle lane between physical features

- Easier for pedestrians to cross the road mid-link (many pedestrians consider full length kerbs to be a barrier to movement)
- Provides greater flexibility to maintain access to private driveways or similar – a common requirement in the urban environment – through the natural gaps created by a light segregation approach
- Offers potential to maintain cycle priority during period of road works as the light segregation features can be more readily moved / relocated to accommodate road works
- Reduced drainage requirements and implications when compared to full segregation by kerblines.

Light segregation could take many forms including:

- Use of 'Armadillos' or similar at regular intervals (see summary sheet L-CL-GE-04 in **Appendix E**)
- Use of splitter islands at regular intervals (see summary sheet L-CL-GE-05 in **Appendix E**)
- Use of other street furniture as deemed appropriate.

It is important to recognise that adopting a light segregation approach requires the implementing Local Authority to accept liability for the segregation features / street furniture as it is outside of the DfT authorisation and approvals process.

It is recommended that sections of light segregation commence with a conventional 1.2m width splitter island with plain faced bollard. There may also be a requirement to provide further splitter islands at appropriate intervals (with light segregation provided in between) in order to reinforce the separation between the cycle lane and general traffic lane.

The application of the 'Armadillo' form of light segregation is exemplified in **Figure 5** below.

Figure 5: 'Armadillo' Form of Light Segregation

Source: Zicla website

2.7.3 Cycle Lane Interactions with other Highway Features

Because cycle lanes share carriageway space with other modes, there are natural interactions with other highway features including bus lanes, bus stops and parking bays. Further commentary is provided in Section 2.11 and detailed in related summary sheets in **Appendix E**.

2.7.4 Contra-flow Cycle Lanes

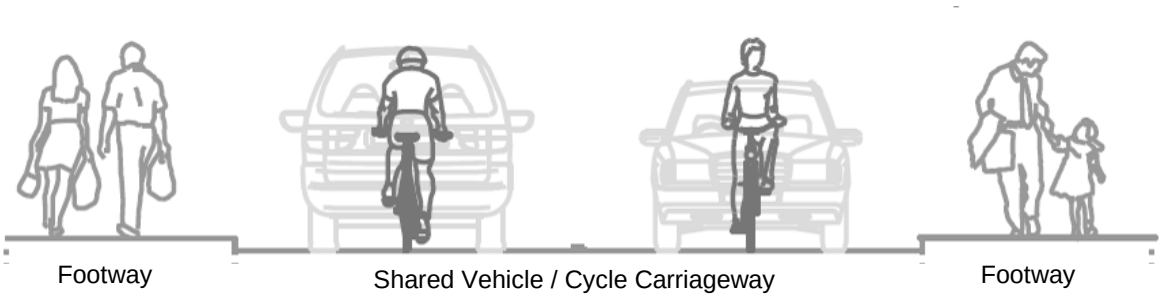
Summary sheet **L-CL-CF-01** in **Appendix E** provides information relating to contra-flow cycle lanes. Following amendments to the Traffic Signs Regulation and General Directions in 2011, new signing relating to contra-flow cycling without segregation and 'No Entry Except Cycles' became permissible from January 2012.

2.8 Quiet Streets

Quiet Streets will generally be characterised by low traffic flows and speeds and may form part of a wider traffic management strategy to restrict use by motorised traffic and/or to reduce speeds. Quiet Streets require an available carriageway width of 7m or less in order to allow cyclists to adopt the primary riding position. Where the kerb-to-kerb distance is greater than 7m, it may be possible to reduce the effective width by provision of hatching (central or on one or both sides) or marking parking bays on one or both sides.

Further information on Quiet Streets is provided on Summary Sheet L-QS-GE-1 in **Appendix E**, with a typical cross-section provided below as **Figure 6**.

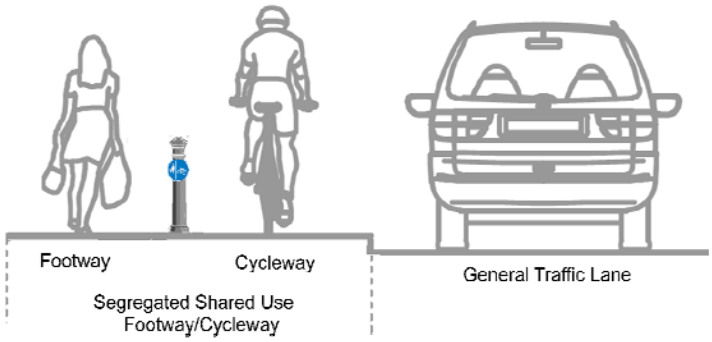
Figure 6: Cross-Section of a Quiet Street



2.9 Shared Use Footways/Cycleways

Shared use routes are designed to accommodate the movement of pedestrians and cyclists. They can be created from new, or by converting existing footways. Shared use routes may be segregated or unsegregated. A segregated route is one where pedestrians and cyclists are separated by a feature such as a white line, a kerb or some other feature. On an unsegregated route, pedestrians and cyclists mix freely and share the full width of the route. Further information is provided in Summary Sheets L-SF-GE-1 (segregated) and L-SF-GE-2 (unsegregated) in **Appendix E**, with a typical cross-section of a segregated facility provided below as **Figure 7**.

Figure 7: Cross-Section of a Segregated Shared Use Footway/Cycleway



Although recognised to be part of the toolkit of options for cycle link facilities, shared use footway/cycleways are consistently placed lower down on the hierarchy of provision, as highlighted in Section 2.3. LTN 1/12 recognises that for cyclists the potential disadvantages of shared use footways/cycleways include poor route continuity and increased potential for conflict with pedestrians (who may also be disadvantaged). There are also safety issues at side road crossings and accesses to consider where cyclists lose priority.

It is, however, reiterated that the hierarchy is not meant to be rigidly applied. If scheme objectives suggest a clear preference for providing cyclists with an off-carriageway facility, as might be the case where a considerable proportion of cycle traffic is for recreation; where there is a significant proportion of children and less confident cyclists; and/or where there are proportionately more cyclists than pedestrians such that the likelihood of conflict is reduced, creating a shared use route might be highly desirable. It may also be case that an end-to-end solution for a particular cycle route necessarily includes a mixture of on-carriageway and shared use routes.

Where it is decided that an ‘on-carriageway’ solution (cycle track, cycle lane or Quiet Street) for part or all of a particular route is not viable, it is recommended that the reasons are documented as this will prove beneficial if there is a requirement to justify a proposal at a later date. Consideration of the potential impact of shared use footways/cycleways on vulnerable pedestrians must form part of the decision process.

2.10 Cycle Paths

Subsequent evolution of the GMCDS will include further detail relating to fully segregated cycle paths which are routed away from the highway network, for example canal towpaths.

2.11 Cycle Route Features

2.11.1 Bus Lanes

Combined bus lanes and cycle lanes are a valuable element in the provision for cyclists, enabling them to share in the time-saving benefits provided to buses, as well as providing safer conditions for cyclists.

Information regarding bus lanes and cycle lanes is provided in Summary Sheet L-CL-BL-1 in **Appendix E**. Specific design guidance is provided below:

- For bus lanes, the preferred situation is a 1.5m cycle lane marked within a 4.5m bus lane. This provides confidence for the cyclists using the lane and a guide to bus drivers that sufficient clearance is available to overtake within the confines of the Bus Lane. Cycle lanes should not be marked in bus lanes less than 4.5m wide.
- Where 4.5m is not feasible, then the Bus Lane should be no wider than 3.2m. This removes the dilemma for bus drivers of whether there is sufficient width to overtake a cyclist within the confines of the bus lane. Cycles are still allowed to use the Bus Lane, but buses will have to drive into the general traffic lane when overtaking.
- Bus lane widths of between 3.2m and 3.9m should not be provided as they leave insufficient room for buses to overtake cyclists or cyclists to overtake queuing or stopped buses within the lane.
- Where off peak parking or loading is permitted in a bus lane, the lane should be at least 4.0m and preferably 4.5m wide in order to allow cyclists to pass stationary motor vehicles without leaving the bus lane.
- The hours of operation of bus lanes where cyclists are permitted should be maximised to provide the highest practicable benefit for cyclists.
- Diagram 1048 (‘Bus Lane’) should always be used in with-flow situations. The use of Diagram 1048.1 (‘Bus and Cycle Lane’) is reserved for contra-flow facilities only.

2.11.2 Bus Stops

A number of alternative solutions exist across the UK for dealing with the interaction of bus stops and cycle link facilities. The choice of treatment will depend on a number of factors including:

- the number of buses using the stop
- levels of use by passengers, pedestrians and cyclists
- routes used by passengers to and from the stop
- access for mobility impaired, particularly the elderly, disabled and those with pushchairs or luggage
- consistency with the provision for non-motorised users in the immediate vicinity.

Summary Sheet L-CT-BS-01 in **Appendix E** shows a solution for a cycle track through a high-use bus stop. This provides an at-grade ‘bypass’ into the carriageway for cyclists that wish to use it, together with a shared footway/cycleway (which could be either segregated or unsegregated, depending on pedestrian and cycle flows) behind the bus stop for less confident cyclists.

Summary Sheet L-CT-BS-02 shows a ‘floating’ bus stop, where the cycle track is diverted behind the bus stop area, with a pedestrian crossing plateaux / raised table area provided at pedestrian crossing points in order to slow cyclists.

Summary Sheets L-CL-BS-01 and 02 illustrate options for continuing a cycle lane through a bus stop on-carriageway. The ‘bypass’ layout shown in L-CL-BS-01 should be used when the bus stop cage has a high occupancy rate, that is 30 buses or more per hour, or if the bus stop cage is occupied for 30 minutes or more during an hour. Summary Sheet L-CL-BS-03 illustrates the continuation of a cycle lane through a bus stop within a bus lane.

The choice of cycle facility arrangement at bus stops will be subject to local site considerations. It is the intention to gather evidence regarding the operational issues and successes of different types of cycle facility implemented at bus stop locations across the Greater Manchester region.

2.11.3 Kerbside Parking

Where there is kerbside parking on a route where cycle lanes are proposed, measures should be taken to provide a satisfactory solution for cyclists. Solutions could include:

- Removal or relocation of the parking to a side road or into a specifically constructed bay
- Run an advisory cycle lane on the outside of the marked parking bays. In this instance, sufficient clearance must be provided so that cyclists are not endangered by the opening of vehicle doors.

Summary Sheets L-CL-PK-1 and L-CL-PK-2 in **Appendix E** provide further information on arrangements for marking advisory cycle lanes on the outside of the marked parking bays and, alternatively, of running the cycle lane on the inside of parking bays, both of which allowing sufficient clearance for cyclists.

Where there are short gaps (<30m) between parking bays, including at junctions, then the cycle lane should maintain its position in the road rather than diverting back to the kerbside.

3 Junctions and Crossings

3.1 Introduction

All cycle routes interact with junctions or crossings to a greater or lesser extent. The whole movement of the cyclist through the junction or crossing should be considered, whether on or off the carriageway. This includes the approach, travelling through the junction / across the crossing, and the exit manoeuvre.

Statistics reveal that the majority of personal injury accidents involving cyclists occur at or within close proximity to junctions. Data collated and analysed for the Greater Manchester region for the period 2010-2012 indicated that 88% of reported accidents with pedal cycle casualties occur at of within 20m of junctions. This statistic reinforces the need to ensure full and appropriate provision for cyclists at junctions.

A large variety of geometric layouts are possible for junctions and crossings reflecting local conditions, too many to define in a guidance document. This chapter provides summary guidance information on priority junctions, signal controlled junctions and cycle crossing facilities and accords with the cycle link information discussed in Chapter 2. Related guidance regarding general geometric standards at junctions, in particular visibility standards and sight-lines, is provided in **Appendix B**.

It is envisaged that this Chapter will be extended as the design guidance evolves through future iterations.

3.2 Priority Junctions

There are a variety of types of priority junctions, including a range of T-junction and cross-road configurations. Where a Vélocity cycle route interfaces with a priority junction, the choice of which movement has priority should be reviewed, with the objective being to optimise the cycle movement(s) both in terms of waiting times and safety. Inter-visibility between cyclists and drivers is of particular importance. Extracts from relevant guidance regarding inter-visibility is included in **Appendix B**.

Example treatment of cycle tracks and cycle lanes through priority junctions are shown in Summary Sheets J-CT-GE-01 to 03 and J-CL-GE 01 and 02 respectively in **Appendix E**. Cycle tracks and lanes shall be treated as an extension to the carriageway (except in the case of 2-way tracks), and the Give Way line for the side road must align with the edge of the marked cycle route. The section of advisory cycle lane that extends across the mouth of the side road should be 0.5m wider than the approach cycle lane width, thereby increasing the conspicuity of cyclists and enabling them to take up a dominant position in the road whilst traversing the junction.

Where appropriate and feasible, priorities at cross-roads should be changed such that cyclists on a cycle route do not have to give way.

3.3 Signal controlled junctions

There are numerous permutations of signal controlled junctions, many of which require bespoke design solutions. Generic design considerations for signal controlled junctions include (but not necessarily limited to) the following:

- As with priority junctions, the width of the advisory cycle lane through signal-controlled junctions should be 0.5m wider than the approaching cycle lane in order to increase cycle route conspicuity
- Advanced Stop Lines (ASLs) should be provided on every approach. The preferred length of the ASL reservoir for cyclists is 5.0m with a minimum of 4.0m
- In some circumstances, part width ASL reservoirs not covering the full width of all approach lanes and with staggered stop lines may be appropriate. Currently part-width ASLs require site-specific DfT approval, although the 2015 revisions to TSRGD may remove this requirement
- Cycle detection should be incorporated in signal control systems where feasible
- Signal timing optimisation should address the needs of cyclists. Where vehicle stoplines are repositioned to allow ASLs, there may be a need to review traffic signal timings to account for the amended stopline positions
- Cycle priority systems at signal controlled junctions including pre-signals, cycle advance signals and left turn filters for cyclists should be considered and DfT authorisation sought as appropriate
- Cycle by-passes at signal controlled junctions should also be considered as appropriate.

3.4 Roundabouts

It is understood that the proposed Cycle City Ambition Grant funded schemes do not route cyclists via roundabouts (with one exception), and as such this Phase 1 guidance document does not include design guidance for cyclists at roundabouts.

It is recognised that there are ongoing trials for ‘Dutch Style’ roundabouts which seek to improve priority for cyclists at roundabouts. The application of such innovative arrangements in Greater Manchester will be subject to further consideration as the need arises and as the guidance document evolves.

3.5 Cycle Crossing Facilities

There are a number of different cycle crossing facilities, with and without signal control. **Table 8** identifies the different crossing types and provides an indication as to which crossing type is most appropriate given differing vehicle, cycle and pedestrian flows.

Where cycle flows are low, either no facility or a central refuge crossing is likely to be most appropriate depending on vehicle flows. Where provided for cycle use, central refuges should be wide enough to accommodate waiting cycles and pedestrians safely. The target minimum island width for straight-across crossings is 2.8m, desirable minimum 2.6m and absolute minimum 2.4m (0.2m wider for speeds >30mph). Where cycle flows are higher (>100 per day), a signal controlled crossing is likely to be required, most likely a Toucan crossing.

Where refuges are installed, the safety of cyclists travelling through the area of localised narrowing must be considered. Section 5.7 of LTN 2/08 contains advice regarding suitable carriageway widths. Gaps of between 2.75m and 3.25m should be avoided as they may encourage motorists to overtake cyclists even though there is insufficient width. Ideally, a width of 4m should be provided to enable such a manoeuvre.

Table 8: Different Cycle Crossing Facilities

Type of crossing	Flows (24 hour)		
	Vehicle flow (along road)	**Cycle flow (crossing)**	**Pedestrian flow (crossing)**
No facility	<3000	Low <100	Low <500
Central refuge	3,000-8,000	Low <100	Low <500
Zebra	3,000-8,000	Very low <10	Medium >500
Shared Zebra	3,000-8,000	Low –med 10 - 200	Medium >500
Puffin	> 8,000	Very low <10	Medium >500
Humped cycle priority	1-3,000	Medium >100	n/a
Signal controlled cycle crossing (no pedestrians)	>8,000	Medium >100	n/a
Toucan	>8,000	Medium >100	Low 50-500
Parallel/Segregated	>8,000	Medium >100	Medium >500

Source: Adapted from Barclays Cycle Superhighways Infrastructure Design Guidance, TfL (2011)

At locations where a cycle route joins or crosses a road, treatment of the crossing will depend upon the type of road and level of use / different modal flows.

Where signal-controlled facilities are justified, a Toucan crossing will be required. The main criterion for introducing a Toucan crossing should be to reduce the level of risk associated with conflict between motorised and non-motorised users at identified crossing points. The provision of Toucan crossings at appropriate locations also represents a positive means of increasing awareness of cycle routes and providing a high-profile infrastructure that reinforces the policy of promoting increased cycling.

The PV^2 criterion which has historically been applied for all types of crossing is now considered too coarse a measure of conflict between vehicular traffic and those crossing. In general, the need for signalled crossing facilities

is determined from site-specific examination of demands and conflicts[1]. For a Toucan crossing, consideration must also be given to the strategic role that it would play in the development of a comprehensive cycling network in Greater Manchester. It is therefore not proposed to define strict numerical criteria for the provision of Toucan crossings. Summary Sheet C-CL-GE-1 in **Appendix E** illustrates a typical Toucan arrangement.

Summary Sheets C-CP-GE-01 and 02 in **Appendix E** illustrate priority-controlled crossings on single and dual carriageways where a Vélocity route crosses a road which is not itself a designated cycle route, and also show the differing arrangement required for footways or verges adjacent to the carriageway.

3.6 Cycles and HGVs

Nationally there is concern over conflicts between cycles and HGVs, predominantly due to limited HGV driver visibility when turning left at junctions. Statistics collated and analysed by Transport for Greater Manchester for the period 2010-2012 indicate that approximately 2% of all reported accidents with pedal cycle casualties involve HGVs. Whilst this is a lower percentage than that reported in other cities such as London, particular attention should be paid to the HGV to cyclist visibility issue when developing proposed junction designs.

[1] LTN 1/95 Section 2

4 Signs and Markings

4.1 Introduction

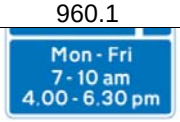
For ease of reference, this Chapter provides summary information on mandatory and informatory signing of cycle facilities and of relevant surface markings. Further details including information on route guidance, location and direction signing is to be provided as future evolutions of the guidance.

4.2 Mandatory & Informatory Signing

There are a number of mandatory and informatory signs associated with cycle facilities. **Table 9** shows those signs that appear on the design Guidance and Standards Summary Sheets for links, junctions and crossings provided in **Appendix E**. The respective diagram numbers refer to those specified in the Traffic Signs Regulations and General Directions (TSRGD), 2002. Careful positioning of signs associated with cycle facilities is required in order to comply with siting requirements, to maximise visibility to all road users and to minimise street clutter. Wherever possible, impact on other road users should be minimised by attaching signs to existing street furniture such as bollards, lighting columns or existing sign poles.

Table 9: Signs associated with cycle facilities

Diag. No (TSRGD)	Description	Details
 955	Route for cycles only	Cycle tracks that are segregated from both motorised traffic and pedestrians
 956	Shared pedestrian/cycle route	Unsegregated shared cycle/footways
 957	Shared pedestrian/cycle route	Segregated shared cycle/footways
 958.1	Start of with-flow cycle lane	Mandatory cycle lane only

Diag. No (TSRGD)	Description	Details
 959.1	With-flow cycle lane	Mandatory cycle lane only; for advisory lane, Diagram 967 must be used.
 960.1	Contra-flow cycle lane	On one-way street with contra-flow cycle lane.
 961	Time qualifying plate	Beneath Diagrams 958.1 and 959.1 as appropriate.
 962.1	Cycle lane at junction or crossing	Warns road users of potential conflict with cycle route. Generally unnecessary except for situations where contra-flow cycling is permitted.
 962.2	Contra-flow bus and cycle lane at junction	Warns road users of potential conflict with cycle route.
 963.1	Pedestrian sign for cycle route crossing	Warns pedestrians of potential conflict with cycle route. Generally unnecessary except for situations where contra-flow cycling is permitted.
 965	End of cycle route	To be used with extreme caution as a key criterion is route continuity. Full justification required.
 966	Cyclists to dismount at the end of, or at a break in, the cycle route	To be used with extreme caution as a key criterion is route continuity. Full justification required.
 967	Route recommended for cyclists on main carriageway	Advisory cycle lane (unless it is only advisory because of local factors, e.g. junction).

4.3 Surface Markings

Road markings used in the data sheets are referenced by their diagram number in TSRGD, 2002. For convenience, all markings are tabulated in **Table 10**, together with the variant(s) recommended for specific circumstances.

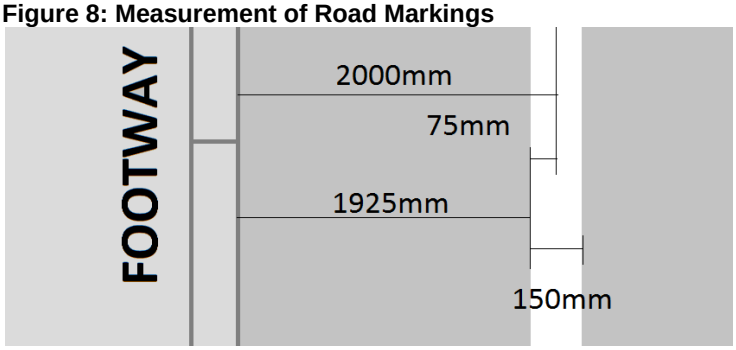
Table 10: Road Markings associated with Cycle Facilities

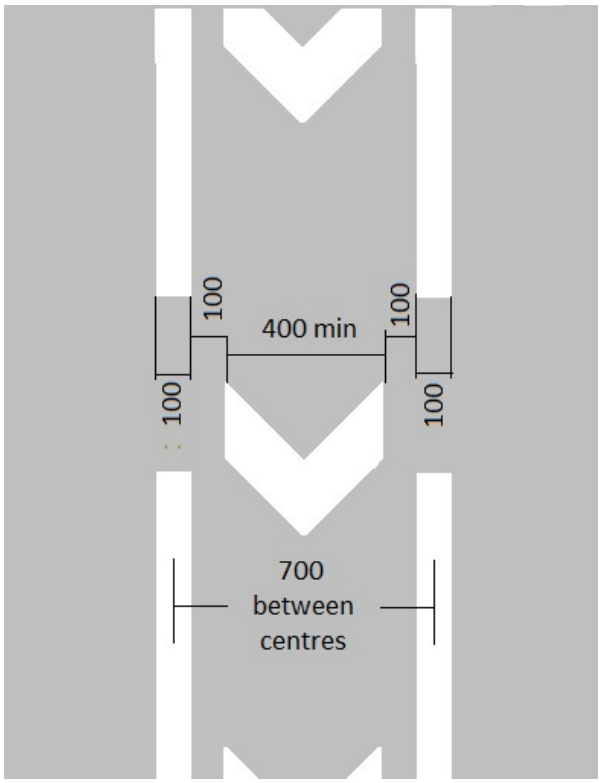
Diag. No (TSRGD)	Description	Details
1001.2	Advanced Stopline for Cyclists (ASL)	Green coloured screed to be laid between stoplines, and for 5m in 'feeder' cycle lane
1003	Give Way	When used across cycle route, 300mm long marking to be used
1004	Advisory Cycle Lane bounding line; or Centre line on 2-way cycle track	4.0m line, 2.0m gap, 150mm wide
1009	Taper at start of cycle lane; or Back of cycle lane across side road	600mm long marking to be used
1014	Swerve arrow where vehicular traffic is deflected by cycle facilities	Use variant appropriate to traffic speed
1023	Give Way triangle	Use 1.875m variant when it applies to cycles
1040.2	Safety buffer hatching	Used to define safety buffers, minimum width 650mm if bounded on one side only (e.g. adjacent to kerb)
1041.1	Safety buffer hatching	Used to define safety buffers, minimum width 700mm, if adjacent to parking or loading bays.
1048.1/1048.4	Cycle/Bus Lane	Use in contra-flow or shared cycle/bus areas only
1049	Boundary between mandatory cycle lane and traffic lane	150mm continuous white line
1049.1	Boundary between pedestrian and cycle sections of a shared segregated cycle/footway or path.	150mm continuous white line, trapezoidal in cross section, 12mm to 20mm in height
1057	Cycle symbol	1.215m variant used within defined cycle facilities; or 1.78m variant used on shared streets
1059	Direction arrow	Use 2m variant in vicinity of junctions, 1m elsewhere

Cycle symbol markings should be provided after each decision point on cycle lanes and tracks, and at a maximum interval of 200m elsewhere. Where practical, cycle symbols should be placed close to street lights to maximise visibility after dark.

When dimensions relate to longitudinal markings, these are measured from the centre of the marking. Thus on a 2.0m cycle lane adjacent to a kerb, the nearest edge of the 150mm wide Diag 1049 marking will be 1.925m from the kerb, and chevron-hatched buffer zones would measure 700mm wide between the centres of the bounding markings, as shown in **Figure 8**.

Figure 8: Measurement of Road Markings





5 Construction Including Surfacing

5.1 Introduction

In accordance with a core principle of the Vélocity 2025 Cycling Plan, it is important that high quality cycle facilities are consistently implemented across Greater Manchester, offering a smooth riding experience to cyclists. A number of general construction requirements are identified below:

- Street furniture, gullies and inspection chambers should be located away from surfaces used by cyclists. Drainage gullies should ideally be located in the kerb, or a continuous kerb drainage system used
- Finished levels of all surfaces within a cycle route should be smooth, flat, well-drained and well-maintained
- Construction joints should be at right angles to the direction of travel.

This guidance document briefly considers the following specific construction issues:

- General geometric standards
- Coloured surfacing
- Segregation of cycle facility from motorised traffic
- Accesses across the cycle facility.

It is envisaged that future evolutions of this design guidance will include (but not necessarily be limited to) the following:

- Drainage
- Tactile Paving & Dropped Kerb Detail
- Lighting
- Headroom
- Cycle Path Construction Options
- Maintenance & Asset Management
- Typical Construction Costs.

5.2 General Geometric Standards

Summary information relating to general geometric standards including visibility standards, stopping sight distances for cyclists, horizontal alignment and vertical alignment is provided in **Appendix B**.

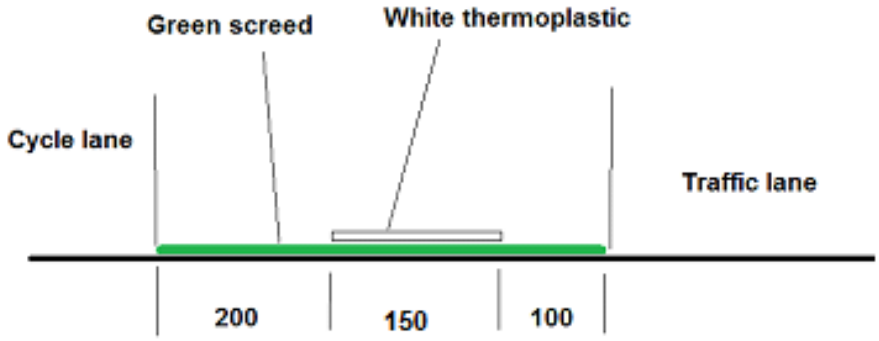
5.3 Coloured Surfacing

The use of green screed coloured surfacing highlights cycle facilities for all road users. It has been demonstrated in independent research that 60% of drivers are more likely to ignore non-coloured facilities. However, blanket application on all cycle facilities would be very expensive and in many cases would not contribute to improved

compliance (for example, on those routes that are segregated from motorised traffic). Its use is therefore recommended in the following circumstances:

- At the beginning and end of cycle lanes
- As a rectangular patch enclosing the Diag 1057 cycle symbol on cycle lanes and Quiet Streets
- Full width of a cycle lane through junctions, past parking bays or in other situations where there is likely to be conflict between cycles and other road users
- In a linear strip 450mm in width beneath Diag 1049 or 1004 cycle lane bounding markings as shown in **Figure 9**.

Figure 9: Screed beneath Cycle Lane Marking



To emphasise the presence of the cycle lane but without incurring the implementation cost and maintenance liability of full coloured surfacing, summary sheets L-CL-GE-01 and L-CL-GE-02 in **Appendix E** both depict the screed beneath cycle lane marking. It is the intention to gather evidence regarding the issues and successes of the application of this (and other) coloured surface treatments implemented through the Vélocity 2025 programme.

5.4 Segregation

Segregation of cycle facilities from other road users can be achieved by physical barriers (level difference in the form of kerbs) or markings. Physical barriers are the preferred level of segregation to separate cycles and motorised traffic. When a kerbed divider is constructed for this purpose, it must conform to the following standards:

- Minimum kerb upstand presented to motorised traffic of 100mm
- Minimum kerb upstand presented to cycles 50mm
- Minimum width of divider (kerb face to kerb face) 500mm

Care must be taken to ensure that adequate drainage of the carriageway and cycle track is provided. On traditional centre-hung cross sections, for example, additional gullies may be required to maintain carriageway drainage.

Where it is not practicable to provide a kerbed divider, additional protection of cycle lanes from motorised traffic on the rest of the carriageway will increase cyclists' comfort and encourage use. Protection to cycle lanes can be provided by the following methods:

- Hatched road markings outside the cycle lane (see **Figure 8** and Summary Sheet L-CL-GE-1, **Appendix E**).
- Intermittent traffic islands (which should not reduce the cycle lane width)
- Raised rib markings / rumble strips (requires DfT authorisation)
- 'Stick on' features such as armadillos (or similar) as used in other European locations. These features are not 'official' markings and, as such, their use is at the liability of the Highway Authority.

5.5 Accesses

It is important that all accesses along a route are maintained. For roads that have large numbers of footway crossings (forecourts, private garage accesses etc), a cycle track would require frequent breaks in the barrier between cycles and general traffic and would therefore not be appropriate. Likewise, a shared footway/cycleway (whether segregated or unsegregated) would be subject to frequent vertical changes in level, and on roads with frequent footway crossings this may result in an undulating cycleway which would be undesirable.

It is therefore recommended that in such circumstances an at-grade cycle lane should be considered. As motor vehicles are not permitted to enter a mandatory cycle lane delineated by a Diagram 1049 marking, at locations where this is required (for example at side road junctions) the cycle lane must revert to advisory. However, if private driveways are located along a length of mandatory cycle lane, the continuous line should be continued across them and an exemption written into the Traffic Regulation Order to permit access[2].

[2] *Traffic Signs Manual, Chapter 5, para 16.5*

Appendix A: References and Bibliography

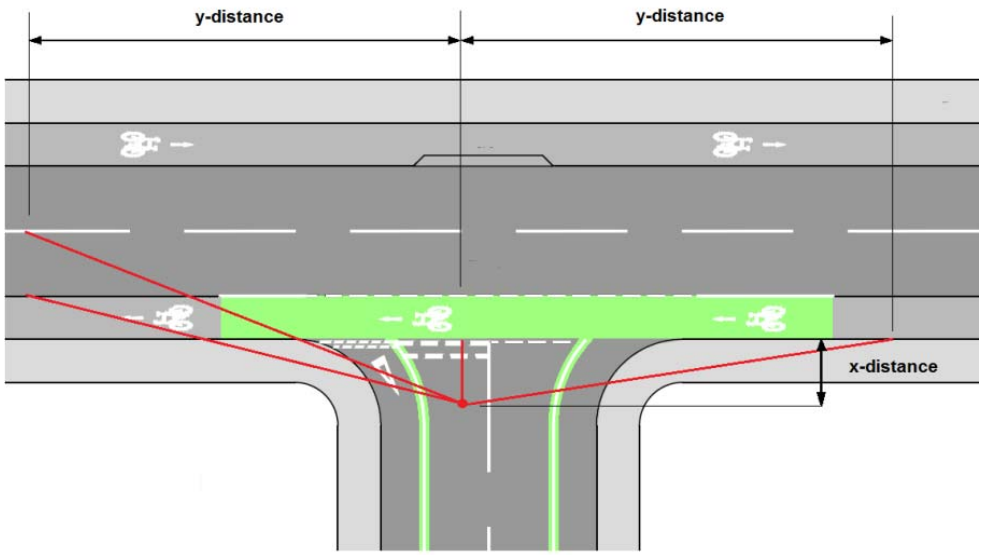
- London Cycling Design Standards, Transport for London, 2009
- Cycling by Design, Transport Scotland, 2011
- Irish National Cycle Manual, National Transport Authority, 2011
- Design Manual for Bicycle Traffic, CROW, 2007
- Design Checklist and Guidance, Cycling England, 2009
- Guidelines and Practical Details Issue 2, Sustrans 1997
- LTN 2/08, Cycle Infrastructure Design, Department for Transport, 2008
- LTN 1/12, Shared Use Routes for Pedestrians and Cyclists, Department for Transport, 2012
- Guidance on the use of Tactile Paving, Department for Transport, 2007
- TAL 6/02, Inclusive Mobility, Department for Transport 2002
- LTN 1/95, The Assessment of Pedestrian Crossings, Department for Transport, 1995
- LTN 2/95, The Design of Pedestrian Crossings, Department for Transport, 1995
- Traffic Signs Manual, Department for Transport
- Traffic Signs Regulations & General Directions 2002, HMSO
- Manual for Streets, Department for Transport/Thomas Telford, 2007
- Manual for Streets 2, Chartered Institution of Highways & Transportation, 2010

Appendix B: Geometric Standards

B1 Visibility Standards

Visibility should be provided in accordance with Section 7.6 of Manual for Streets. The determination of x and y distances is detailed in Section 2 of LTN 2/08.

Figure B1: Visibility Requirements



An x-distance of 2.4m is recommended for use in urban areas. In lightly-trafficked and low-speed situations this may be reduced to 2m.

- y-distances should be in accordance with the SSD values given in Table 7.1 of Manual for Streets (reproduced below). Where visibility measurements relate to the position of a motorised vehicle, the 'SSD plus bonnet length' value should be used.

Table 7.1 Derived SSDs for streets (figures rounded).

Speed	Kilometres per hour	16	20	24	25	30	32	40	45	48	50	60
	Miles per hour	10	12	15	16	19	20	25	28	30	31	37
SSD (metres)		9	12	15	16	20	22	31	36	40	43	56
SSD adjusted for bonnet length. See 7.6.4		11	14	17	18	23	25	33	39	43	45	59
		Additional features will be needed to achieve low speeds										

- x-distances, and y-distances to the right, should be measured from the nearest edge of the cycle route. For 1-way cycle facilities running parallel to and in the direction of nearside traffic, this will generally be the boundary between cycle route and footway. For 2-way and contra-flow facilities see drawing-specific notes.
- y-distances to the left should generally be measured to the centre line of the carriageway. For 2-way and contra-flow cycle lanes see drawing-specific notes.

B2 Stopping Sight Distances for Cyclists

Table B1 gives equivalent stopping distances for cyclists in dry conditions. These have been based on a 1½ second reaction time and a deceleration of 0.56g, in accordance with independent research[3].

Table B1: Stopping Sight Distances for Cyclists

SPEED	km/h	16	20	24	25	30	32	40	45	48
	mph	10	12	15	16	19	20	25	28	30
Cycle SSD (m)		8	11	14	15	19	21	28	33	36

B3 Horizontal Alignment

On links, a minimum radius of 20.0m is recommended to allow cyclists to accommodate cyclists travelling at 20mph. On low-speed, lightly trafficked areas this can be reduced to 10m.

At junctions, where cyclists share road space with motorised traffic either in a ‘quiet street’ or in a cycle lane, tight kerb radii of 3.0 to 5.0m at side streets should be used to restrict the speed of turning traffic. Where side roads have cycle tracks, the optimum cycle radius at junctions is 5.0m. This allows cyclists to turn within the confines of the cycle lane.

B4 Vertical Alignment

Crossfall on cycle routes should be no greater than 2.5% (1 in 40) to facilitate drainage. Wherever possible, crossfall should be arranged such as to present positive camber at bends and turns.

Longfall should normally not exceed 5% (1 in 20). The target width of cycle facility should always be used where gradients exceed 7% (1 in 14).

[3] *Bicycling Science 3rd Edition (2004); David Gordon Wilson, MIT Press*

Appendix C: Construction Cost Estimates Look-up Table

Table C1 - Construction Cost Estimates Look-up Table

Sheet number	Data Sheet Reference	Data Sheet title	Extent of assumed carriageway width alterations [1]	Extent of assumed footway width alterations [1]	Work Zone Length	Typical cost HIGH (full civil works) [2]	Typical cost LOW (limited civil works) [3]
1	L-CT-GE-1	One Way Cycle Track	+1.0m	n/a	1,000m	£960k – £1.3m [4]	£420k – £580k [4]
2	L-CT-GE-2	Two Way Cycle Track	+0.5m	n/a	1,000m	£880k – £1.2m [5]	£300k – £400k [5]
3	L-CT-HT-1	Hybrid Terrace Cycle Track	+1.0m	+1.0m	1,000m	£1.5m – £1.9m [4]	£500k – £700k [4]
4	L-CL-GE-1	Cycle Lane with permeable buffer	+1.0m	n/a	1,000m	£750k – £1.0m [4]	£160k – £220k [4]
5	L-CL-GE-2	Mandatory Cycle Lane	+1.0m	n/a	1,000m	£190k – £265k [4]	£70k – £90k [4]
6	L-CL-GE-3	Advisory Cycle Lane	+1.0m	n/a	1,000m	£190k – £265k [4]	£70k – £90k [4]
7	L-SF-GE-1	Shared Foot/Cycleway – Segregated	n/a	+2.0m	1,000m	£900k – £1.2m [4]	£190k – £250k [4]
8	L-SF-GE-2	Shared Foot/Cycleway – Unsegregated	n/a	+1.0m	1,000m	£500k – £690k [4]	£105k – £150k [4]
9	L-QS-GE-1	Quiet Street	-1.0m	n/a	1,000m	£500k – £680k [4]	£100k – £150k
10	L-CL-CF-1	Contraflow Cycle Lane	n/a	n/a	1,000m	£40k – £50k	n/a
11	L-CL-BL-1	Cycle Lane at Bus lane	+1.5m	n/a	1,000m	£900k – £1.2m [5] with Cycle Lane £580k – £780k Without Cycle Lane	£200k – £300k [5] with Cycle Lane £130k – £195k Without Cycle Lane
12	L-CL-PK-1	Cycle Lane at Parking Bays	+1.0m	n/a	75m	£60k – £80k [5]	£15k – £20k [5]
13	L-CL-PK-2	Cycle Lane at Parking Bays (Alternative)	+1.0m	n/a	75m	£75k – £105k [5]	£15k – £20k [5]
14	L-CT-BS-1	One Way Cycle Track at a Bus Stop	+1.5m	+2.0m	75m	£115k – £155k [5]	£40k – £50k [5]
15	L-CL-BS-1	Cycle Lane at Bus Stop	+2.0m	n/a	75m	£85k – £120k [5]	£20k – £30k [5]
16	L-CL-BS-2	Cycle Lane at Bus stop (Alternative)	+2.0m	n/a	75m	£75k –£100k[5]	£20k – £25k [5]
17	L-CL-BS-3	Cycle Lane at Bus Stop within Bus Lane	+1.5m	n/a	75m	£55k – £75k [5]	£15k – £20k [5]
18	J-CT-GE-1	One Way Cycle Track at a side road	+1.0m	n/a	50m	£60k – £80k [4]	£20k – £30k [4]
19	J-CT-GE-2	Two Way Cycle Track at a side road	+0.5m	n/a	50m	£50k – £65k [5]	£20k – £25k [5]
20	J-CT-GE-3	Two Way Cycle Track at a side road 5.0m Set back	+0.5m	n/a	50m	£60k – £80k [5]	£30k – £40k [5]
21	J-CT-GE-4	Cycle Track through a signal controlled junction	+0.5m	n/a	250m	£140k – £190k [4]	£70k – £100k [4]

Sheet number	Data Sheet Reference	Data Sheet title	Extent of assumed carriageway width alterations [1]	Extent of assumed footway width alterations [1]	Work Zone Length	Typical cost HIGH (full civil works) [2]	Typical cost LOW (limited civil works) [3]
22	J-CL-GE-1	Mandatory Cycle Lane at a side road	+1.0m	n/a	50m	£35k – £50k [4]	£10k – £15k [4]
23	J-CL-GE-2	Advisory Cycle lane at a side road	+1.0m	n/a	50m	£35k – £50k [4]	£10k – £15k [4]
24	J-CL-GE-3	Cycle Lane through a signal controlled junction	+0.5m	n/a	250m	£140k – 190k [4]	£70k – 100k [4]
25	C-CL-GE-1	Cycle Lane at a Toucan Crossing	+0.5m	+1.0m	50m	£90k – £120k [4] Including crossing £60k – £85k Not including crossing	£60k – £80k [4] Including crossing £30k – £45k Not including crossing
26	C-CP-GE-1	Cycle Crossing at a major road	n/a	n/a	100m	£6k – £8k	n/a
27	C-CP-GE-2	Cycle Crossing at a dual carriageway	n/a	n/a	100m	£15k - £20k	n/a

Notes:

1. Total carriageway and/or footway alteration across full cross section
2. The 'high' cost estimate range is based on maximum civil engineering intervention with associate changes to kerb lines drainage, pavements, footways and street lighting.
3. The 'low' cost estimate range is based on minimal civil engineering intervention assuming the design standard has been adopted because it is the best fit to the existing highway cross section and highway space allocation.
4. Assumes provision of stated cycle facility on both sides of the carriageway.
5. Assumes provision of stated cycle facility on one side of the carriageway only.

Cost estimates provided are indicative only and can vary significantly depending upon local site conditions.

Example

When estimating the cost of a particular link treatment along a route, it should be remembered that the cost of 'features' (e.g. bus stops, side roads etc) includes the cost of the treatment itself along the work zone length given in column 6 of the Table, so the designer must be careful not to double count this when determining indicative scheme costs. For example, if a one-way cycle track is being proposed for, say, a 2km length of road and there are 5 side road crossings and 4 bus stops along that length, the indicative cost for the side roads would be calculated by the cost for each side road treatment multiplied by 5, and for the bus stops by the cost for each bus stop multiplied by 4. The cost for the remaining length of link treatment is then calculated by multiplying the link unit cost by the remaining link length, i.e. 2km – (5 x 50m) – (4 x 75m) = 1.45km.

Appendix D: Cycle Parking Standards

D1 Overview

It is recognised that there are a number of different cycle parking options and that the subject could warrant extensive guidance in its own right. This appendix provides an overview of four different types of cycle parking facility currently in use across Greater Manchester. These are:

- Sheffield Stand (or similar) : uncovered
- Sheffield Stand (or similar) : part covered
- Sheffield Stand (or similar) : fully covered (collective facility)
- Cycle lockers (individual facility)

Table D1 overleaf considers each type of cycle parking facility against the following criteria:

- application
- typical space requirements
- ease of use / user appeal
- security / locational requirements
- typical implementation cost ranges.

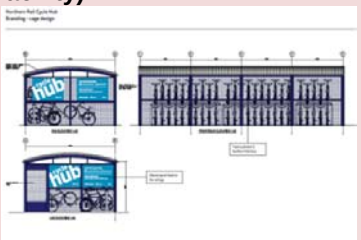
The final page of this appendix contains information regarding typical dimensions of cycle parking stands and recommended spacing, together with examples of alternative innovative cycle parking systems.

The application of different cycle parking facilities is at the discretion of the designer and the local site and budgetary considerations. Suitable locations sited near to key destinations; supply sufficient to match demand; good levels of surveillance and security; and weather protection are key features of good cycle parking facilities.

It is the intention that this section on cycle parking will be extended and updated as required through future iterations of the GMCDGS.

Table D1 - Cycle Parking Options

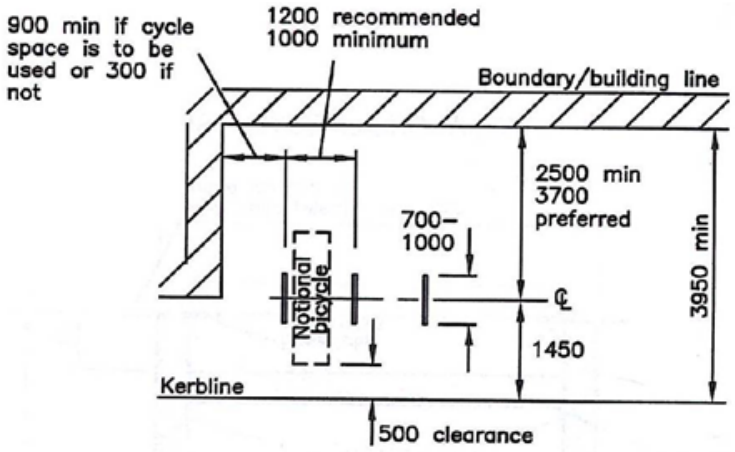
		Application	Typical Space Requirements	Ease of Use / User Appeal	Security / Locational Requirements	Typical Costs
1	**Sheffield Stands (or similar) - uncovered**  	• Use where general public are accessing cycle parking • Suitable for range of users e.g. casual, short-term • Site should have natural surveillance • Uncovered OK for short-term use, for longer periods of time consider part or fully covered stands	• Optimum distance between adjacent stands of 1.2m for ease of access • See diagram on page 3 for details of space required	• Sheffield stands (or similar) are generally well liked by cyclists, but need to ensure appropriately spaced apart • Preferable to provide cover where opportunity/funding permits in order to maximise appeal. • Some variants (e.g. Streetpods) offer enhanced security – see details on Page 3	• Individuals need to carry 'D' lock or similar • Need to ensure good visibility, ideally within CCTV coverage • Need to locate close to destinations, ideally within 30m	• £20-£150 per stand (2 cycles) plus installation (approx. £50 per stand) • Maintenance costs : low
2	**Sheffield Stands (or similar) – Part Covered**  	• Generally for medium to long-term cycle parking (e.g. schools, all-day) where surveillance is good	• Depends on size of shelter. Generally marginally more than for uncovered stands	• Preferable to uncovered Sheffield stands • Side panels can provide extra weather protection, and may be used for branding and/or cycle route info • Provides some weather protection, but cycles open to interference	• Individuals need to carry 'D' lock or similar • Need to ensure good visibility, ideally within CCTV coverage • Need to locate close to destinations, ideally within 30m • Need to consider prevailing wind to maximise weather protection	• £1,000-£2,500 per shelter (covering 6 Sheffield stands, 12 cycles); plus cost of stands (£20-£150 per stand); plus installation costs (tbc locally). • Maintenance costs : medium

		Application	Typical Space Requirements	Ease of Use / User Appeal	Security / Locational Requirements	Typical Costs
3	**Sheffield Stands (or similar) – Fully Covered (collective facility)**  	• Locations with concentrated demand for long-term, regular cycle parking • Areas where vandalism to parked cycles is recognised issue, and/or limited natural surveillance	• Compound area must include space for manoeuvring cycles into/out of stand • Compounds from 6m by 4m for 10 cycles (One row of cycle racks) or 6m by 6m for 20 cycles (two rows of cycle racks with central aisle). See diagram on final page.	• Provides weather protection to encourage long-term use • Additional security 'layer' to dissuade casual theft/vandalism	• Compound requires key/user access control system • If a members scheme, this is more resource intensive and has a longer term cost implication	• Compounds start at £1,000; plus cost of stands (£20-£150 per stand); plus installation costs (tbc locally). Cost per cycle reduces as size increases • Maintenance costs : medium to high
4	**Cycle Lockers (individual facility)**  	• Long-term secure storage • Suitable where natural surveillance is poor	• 1.2m wide by 1.9m long per locker	• Must accommodate cycles horizontally • Must have inner locking facility to improve security • Good weather protection • May be used to store additional equipment (helmet etc)	• Invalidates insurance if cycle not locked internally, so needs either integral locking tether or internal Sheffield-type stand.	• £600-£800 per locker plus installation costs (tbc locally) • Maintenance costs : medium to high

NOTE: In circumstances where space is limited and/or demand is high, there is an option to utilise multi-level or semi-vertical cycle parking facilities

Dimensions of stands and recommended spacings

SHEFFIELD STANDS



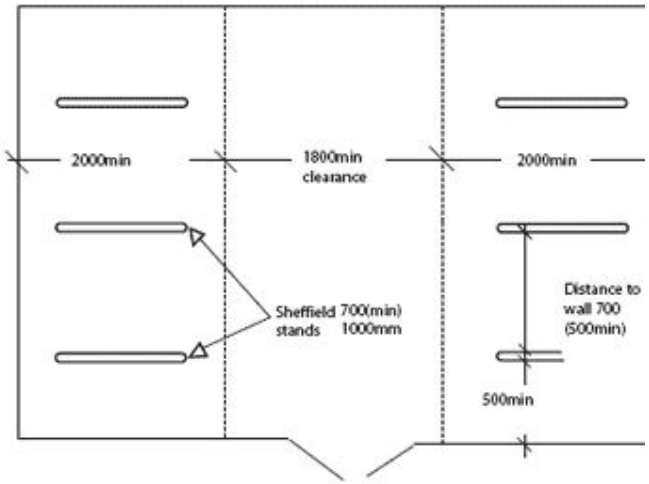
Area Required for 5 No. Sheffield Stands:

6.6m x 4.0m if need to maintain pedestrian route between Sheffield Stands and boundary/building line;

OR

6.6m x 3.0m if do not need to maintain pedestrian route between Sheffield Stands and Boundary/building line.

COMPOUNDS
(Internal dimensions)



10 Velowspace

www.velominck.nl

11 Streetpod

http://cyclepods.co.uk/products/streetpods/

3 Plantlock

http://www.frontyardcompany.co.uk/products/plantlock.html

E1 Purpose of Design Guidance & Standards Summary Sheets

The purpose of the Design Guidance & Standards Summary Sheets contained within this Appendix, and indeed the guidance document generally, is to promote consistency of provision of high quality cycle facilities across the city region. The summary sheets have been formatted to provide a one page reference for each of the respective cycle facilities and include:

- a cross section
- a plan view, annotated with associated signing as appropriate
- a look-up table regarding target, desirable minimum and absolute minimum dimensions
- a list of key advantages and disadvantages
- a list of key criteria
- relevant notes
- typical cost ranges.

As with any guidance, it is recognised that the summary sheets can only offer generic layouts and cannot provide solutions for the range of site specific design challenges that occur in the real world. As such, the onus remains of the designer to make best use of the guidance to achieve high quality cycling infrastructure with due consideration of the local constraints and other road users.

It is the intention that the Greater Manchester Cycling Design Guidance & Standards will be a “live” document with the content and summary sheets to be extended and updated as required through iteration.

E2 Numbering Convention

The numbering convention applied to the Design Guidance & Standards Summary Sheets is **A-BB-CC-N**, where:

- **A** is the type of drawing (L = Link, J = Junction, C = Crossing);
- **BB** is the cycle facility (CT = Cycle Track, CL = Cycle Lane, SF = Shared Footway, CP = Cycle Path, QS = Quiet Street);
- **CC** gives the feature specific to that sheet (GE = GEneral, BS = Bus Stop, BL = Bus Lane, HT = Hybrid Terrace, PK = ParKing and CF = Contra-Flow); and
- **N** is a numeric series number.

By way of example, drawing number L-CL-BS-1 will be a Link drawing showing a **C**ycle **L**ane at a **B**us **S**top.

E3 Ordering of Design Guidance & Standards Summary Sheets

Reflecting the key Vélocity 2025 objective or providing largely segregated cycle facilities, the Summary Sheets have been deliberately ordered, commencing with cycle tracks and segregated cycle lanes.

E4 Links

Each particular link type in the **GE**neral series is presented as a one page summary sheet, comprising a plan view and cross-section drawing as appropriate, advantages and disadvantages, a list of key criteria and an indicative unit cost rate. For sheets illustrating features on a particular type of link, the costs given on those sheets provide an additional cost for that feature.

E5 Junctions

The **J**unctions series illustrates options for dealing with cycle facilities at priority and signal controlled junctions.

E6 Crossings

The **C**rossings series includes details for off-highway cycle paths intersecting roads that themselves are not part of a cycle route, and a typical Toucan Crossing facility.

E7 Exceptions

It is inevitable that designers from the respective Districts will be faced with situations where departure from the Vélocity standards may be necessary. These departures must be considered on a case-by-case basis, and supporting information should be compiled to justify the need for a deviation from the standards. These will be useful as a reference document when the designs are subjected to safety audits.

E8 Index of Design Guidance & Standards Summary Sheets

Table E1 opposite provides an index of the Design Guidance & Standards Summary Sheets produced in support of this guidance document.

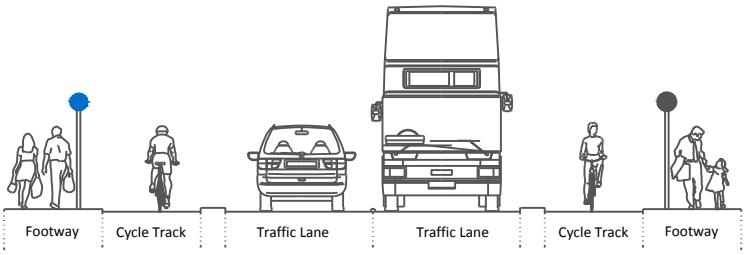
Table E1: Design Guidance and Standards Summary Sheets

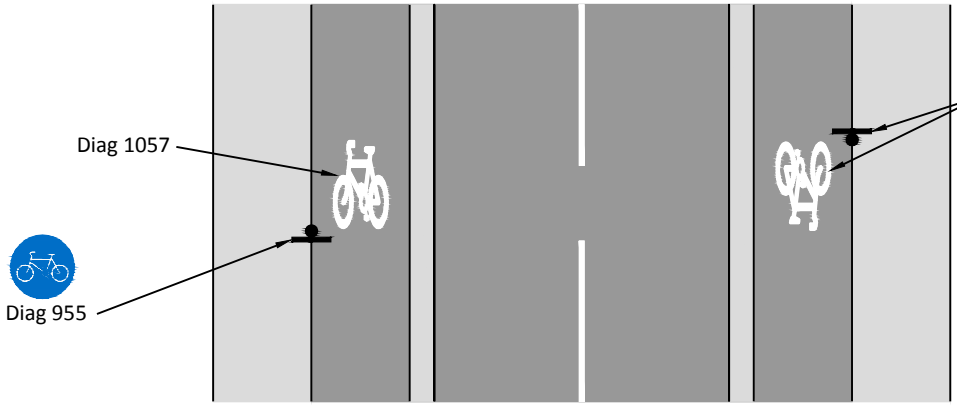
Links	
L-CT-GE-1	One Way Cycle Track
L-CT-GE-2	Two Way Cycle Track
L-CT-HT-1	Hybrid Terrace Cycle Track
L-CL-GE-1	Mandatory Cycle Lane
L-CL-GE-2	Advisory Cycle Lane
L-CL-GE-3	Advisory Cycle Lane with chevron permeable buffer
L-CL-GE-4	Mandatory Cycle Lane with intermittent 'Armadillo' features
L-CL-GE-5	Mandatory Cycle Lane with intermittent traffic island
L-SF-GE-1	Shared Foot/Cycleway – Segregated
L-SF-GE-2	Shared Foot/Cycleway – Unsegregated
L-QS-GE-1	Quiet Street
L-CL-CF-1	Contraflow Cycle Lane
L-CL-CF-2	Contraflow Cycle Lane without entry island
L-CL-BL-1	Cycle Lane within a Bus Lane
L-CL-PK-1	Cycle Lane at Parking Bays
L-CL-PK-2	Cycle Lane at Parking Bays (Alternative)
L-CT-BS-1	One Way Cycle Track at a Bus Stop
L-CT-BS-2	One Way Cycle Track at Floating Bus Stop
L-CL-BS-1	Cycle Lane at Bus Stop
L-CL-BS-2	Cycle Lane at Bus Stop (Alternative)
L-CL-BS-3	Cycle Lane at Bus Stop within Bus Lane
Junctions	
J-CT-GE-1	One Way Cycle Tracks at a side road
J-CT-GE-2	One Way Cycle Track at side road – Raised junction
J-CT-GE-3	One Way Cycle Track at side road – Raised junction with 5.0m setback
J-CT-GE-4	Two Way Cycle Track at side road – Raised junction
J-CT-GE-5	Two Way Cycle Track at side road – Raised junction with 5.0m setback
J-CL-GE-1	Mandatory Cycle Lane at a side road
J-CL-GE-2	Advisory Cycle Lane at a side road
Crossings	
C-CL-GE-1	One Way Mandatory Cycle Lane at a Toucan Crossing
C-CP-GE-1	Cycle Crossing at a major road
C-CP-GE-2	Cycle Crossing at a dual Carriageway

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACKS





Diag 955 and Diag 1057 to be located at start of cycle track, after each break and at intervals along the route so as to be visible from the previous sign.
Mount on other street furniture (E.g lighting columns) where possible to reduce clutter.

Target	>2.0m	2.5m	> 0.5m(5)	3.5m	3.5m	> 0.5m(5)	2.5m	>2.0m
Desirable Minimum	2.0m(1)	2.0m		3.25m	3.25m		2.0m	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(3)		3.0m(4)	3.0m(4)		1.5m(3)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2) Localised narrowing of footway due to street furniture permitted.
(3) Absolute minimum cycle track width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.(5) Desirable and absolute minimum to be 0.5m.

Advantages:

- High profile facility exclusively for cycles
- Provides positive physical segregation from motorised traffic and pedestrians

Disadvantages:

- Has to revert to cycle lanes through junctions
- Sometimes complex solutions for bus stops and adjacent on-street parking or loading areas
- Requires wide highway
- High construction costs due to drainage issues

Key Criteria:

- Physical segregation between cyclists and both motorised vehicles and pedestrians.
- 24-hour operation
- No loading and no parking
- Street furniture including lighting columns and signs and supporting structures to be located outside of cycle track
- Consistent quality is essential, no changes in track widths, no “gaps”
- No coloured surfacing
- Smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads / driveway accesses intersect cycle track
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle track. Additional gullies may be needed to provide adequate carriageway drainage.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£420,000
Upper Cost Estimate	£1,300,000

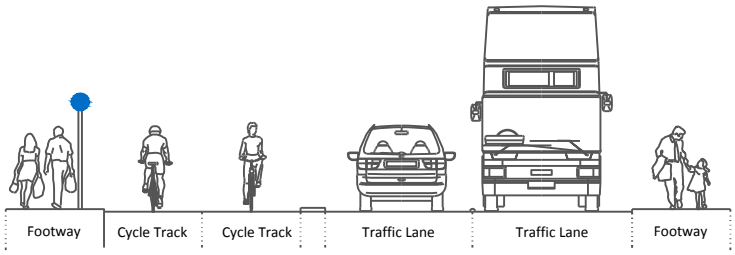
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CT-GE-01	Rev:
Lead Section:	LINKS	

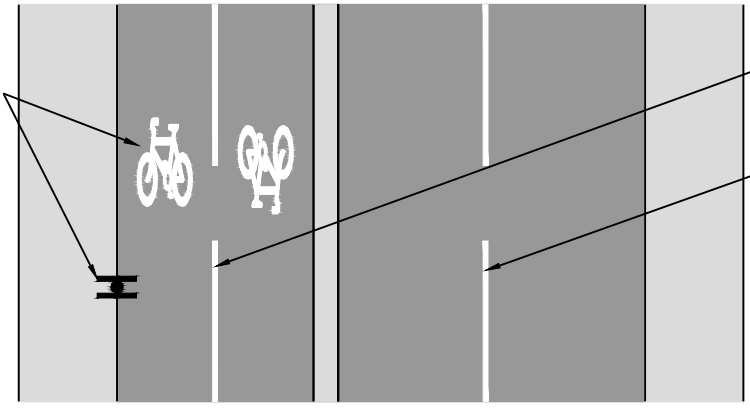
Transport for Greater Manchester

Title:

TWO-WAY CYCLE TRACK



Diag 955 mounted back to back and Diag 1057 to be located at start of cycle track, after each break and at intervals along the route so as to be visible from the previous sign.
Mount on other street furniture (E.g lighting column) where possible to reduce clutter



Target	>2.0m	4.0m	> 0.5m(5)	3.5m	3.5m	>2.0m
Desirable Minimum	2.0m(1)	3.0m		3.25m	3.25m	2.0m(1)
Absolute Minimum	1.8m(2)	2.0m(3)		3.0m(4)	3.0m(4)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2) Localised narrowing of footway due to street furniture permitted.
(3) Absolute minimum cycle track width for low cycle demand (<100/day) , only permitted over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.(5) Desirable and absolute minimum to be 0.5m.

Advantages:

- High profile facility exclusively for cycles
- Provides positive physical segregation from motorised traffic and pedestrians

Disadvantages:

- Has to revert to cycle lanes through junctions
- Sometimes complex solutions for bus stops and adjacent on-street parking or loading areas
- Requires wide highway
- High construction costs due to drainage issues

Key Criteria:

- Physical segregation between cyclists and both motorised vehicles and pedestrians.
- 24-hour operation
- No loading and no parking
- Street furniture including lighting columns and signs and supporting structures to be located outside of cycle track
- Consistent quality is essential, no changes in track widths, no “gaps”
- No coloured surfacing
- Smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads / driveway accesses intersect cycle track
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle track. Additional gullies may be needed to provide adequate carriageway drainage.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£300,000
Upper Cost Estimate	£1,200,000

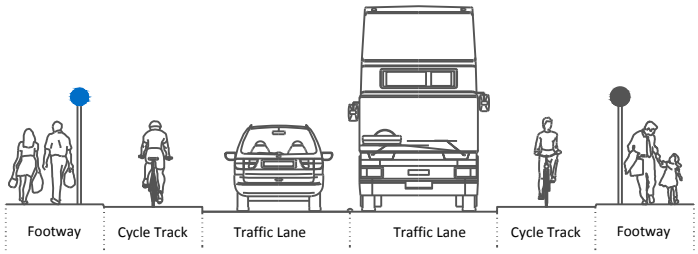
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

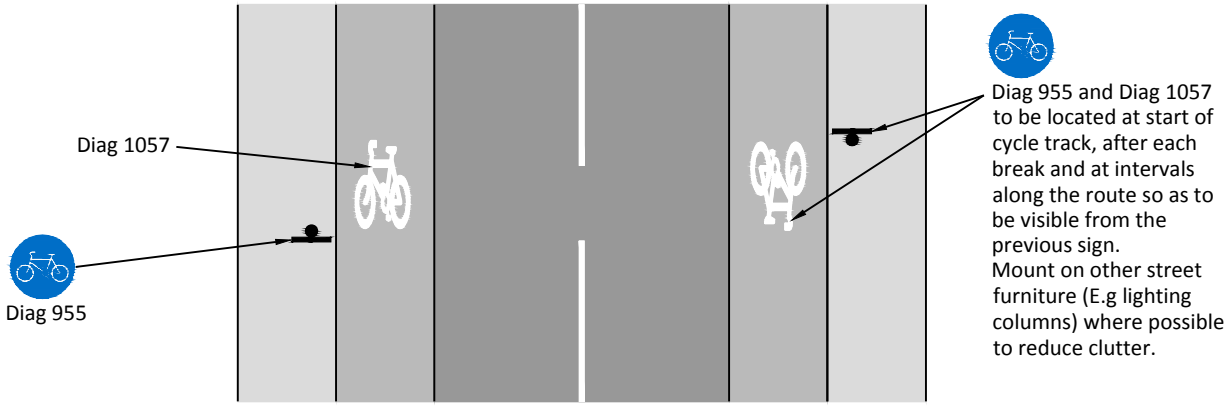
Drawing No:	L-CT-GE-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

HYBRID TERRACE CYCLE TRACKS





Target	>2.0m	2.5m	3.5m	3.5m	2.5m	>2.0m
Desirable Minimum	2.0m(1)	2.0m	3.25m	3.25m	2.0m	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(3)	3.0m(4)	3.0m(4)	1.5m(3)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2) Localised narrowing of footway due to street furniture permitted.
(3) Absolute minimum cycle track width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- High profile facility exclusively for cycles
- Provides positive physical segregation from motorised traffic and pedestrians

Disadvantages:

- Has to revert to cycle lanes through junctions
- Sometimes complex solutions for bus stops and adjacent on-street parking or loading areas
- Requires wide highway
- High construction costs
- No buffer zone between traffic and cycles

Key Criteria:

- Physical segregation (level difference) between cyclists and both motorised vehicles and pedestrians.
- 24-hour operation
- No loading and no parking
- Street furniture including lighting columns and signs and supporting structures to be located outside of cycle track
- Consistent quality is essential, no changes in track widths, no “gaps”
- No coloured surfacing
- Smooth, flat, well-drained and well-maintained surface
- Less appropriate where frequent side roads / driveway accesses intersect cycle track

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£500,000
Upper Cost Estimate	£1,900,000

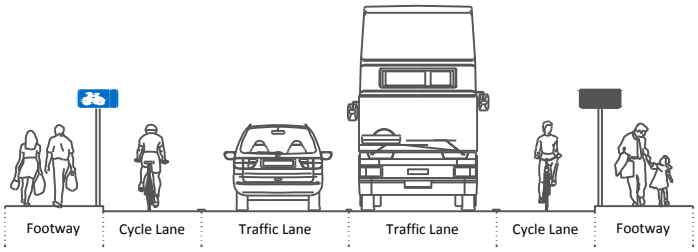
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

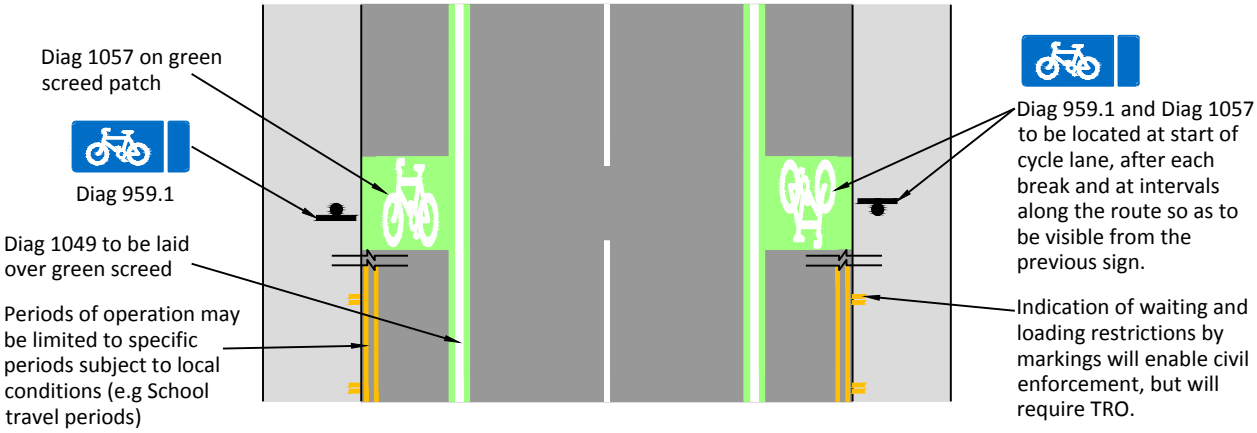
Drawing No:	L-CT-HT-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANE





Target	>2.0m	2.0m	3.5m	3.5m	2.0m	>2.0m
Desirable Minimum	2.0m	1.5m	3.25m	3.25m	1.5m	2.0m
Absolute Minimum	1.8m(1)	1.2m(2)	3.0m(3)	3.0m(3)	1.2m(2)	1.8m(1)

(1) Localised narrowing of footway due to street furniture permitted - need to reflect pedestrian flows.
(2) Absolute minimum cycle lane width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(3) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- Exclusive use by cyclists during specified hours of operation
- Delineated by a solid line, less likely to be crossed by drivers than an advisory lane
- Drivers commit an offence if they enter the lane

Disadvantages:

- Requires a TRO which can be a lengthy process and subject to objections
- Has to revert to advisory where vehicles can legitimately cross (e.g. junctions, adjacent to parking or loading bays, where traffic lanes are narrow)
- High level of statutory signing requirements

Key Criteria:

- Consistent quality is essential, no changes in lane widths, no “gaps”.
- Sufficient road width must be available to cater for other road users outside the cycle lane.
- Parking and loading not permitted in cycle lane and must be provided elsewhere if required. Mandatory cycle lane has to change to advisory cycle lane through junctions, at bus stops, and at parking and loading areas.
- Green surfacing to be provided at the beginning and end of mandatory sections of cycle lane; around cycle logos (Diag 1057); and adjacent to the longitudinal road marking.
- Smooth, flat, well-drained and well-maintained surface.
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle lane.
- 24-hour operation.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£70,000
Upper Cost Estimate	£265,000

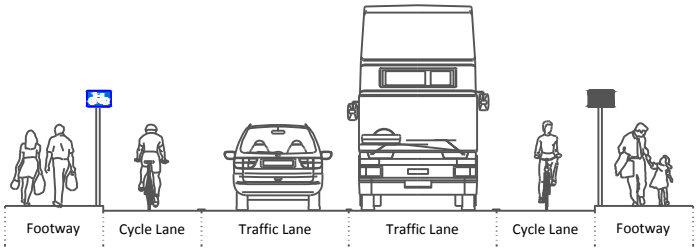
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

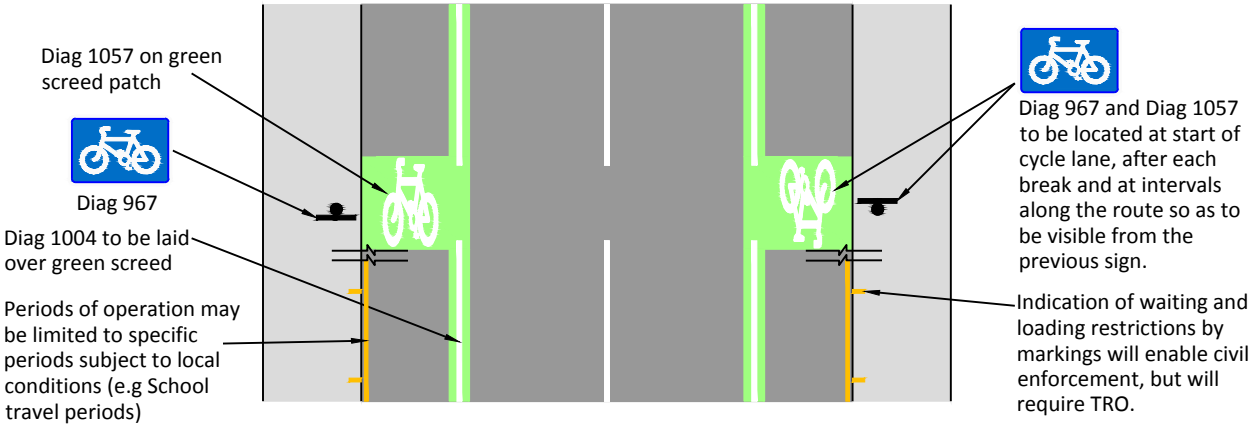
Drawing No:	L-CL-GE-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

ADVISORY CYCLE LANE





Target	>2.0m	2.0m	3.5m	3.5m	2.0m	>2.0m
Desirable Minimum	2.0m	1.5m	3.25m	3.25m	1.5m	2.0m
Absolute Minimum	1.8m(1)	1.2m(2)	3.0m(3)	3.0m(3)	1.2m(2)	1.8m(1)

(1) Localised narrowing of footway due to street furniture permitted - need to reflect pedestrian flows.
(2) Absolute minimum cycle lane width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(3) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- No TRO required for cycle lane
- Quick to introduce
- Low level of signing
- Solution for use alongside adjacent parking and loading bays, bus stops and across junctions, or on sections of road with narrow traffic lanes

Disadvantages:

- Indicative only - no statutory backing
- Largely ignored by other road users
- TRO may be required to keep lane clear of parked and loading vehicles at specific times

Key Criteria:

- Consistent quality is essential, no changes in lane widths, no “gaps”.
- Sufficient road width must be available to cater for other road users outside the cycle lane.
- Advisory cycle lanes should be used where there are demands for waiting or loading that cannot be mitigated by design. A Traffic Regulation Order will be required to impose waiting and loading restrictions appropriate to the level of prohibition required.
- Green surfacing to be provided at the beginning and end of mandatory sections of cycle lane; around cycle logos (Diag 1057); and adjacent to the longitudinal road marking.
- Smooth, flat, well-drained and well-maintained surface.
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle lane.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£70,000
Upper Cost Estimate	£265,000

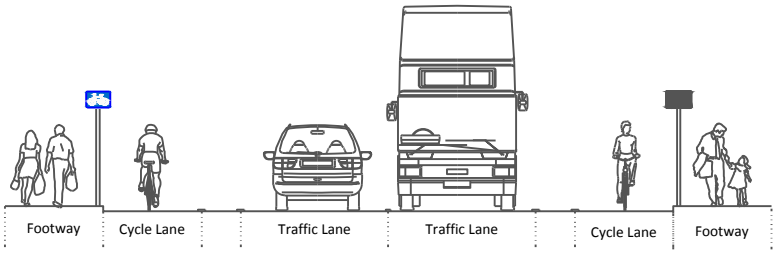
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

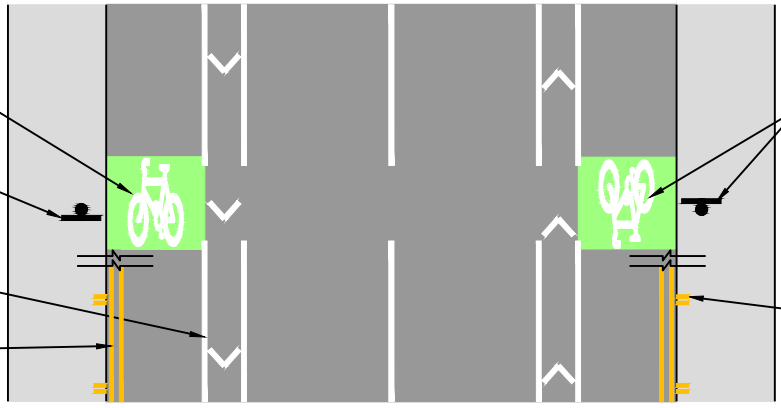
Drawing No:	L-CL-GE-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

ADVISORY CYCLE LANE WITH CHEVRON PERMEABLE BUFFER





Diag 1057 on green screed patch

Diag 967

Diag 1041.1

Periods of operation may be limited to specific periods subject to local conditions (e.g School travel periods)

Diag 967 and Diag 1057 to be located at start of cycle lane, after each break and at intervals along the route so as to be visible from the previous sign.

Indication of waiting and loading restrictions by markings will enable civil enforcement, but will require TRO.

Target	>2.0m	2.0m	0.7m min	3.5m	3.5m	0.7m min	2.0m	>2.0m
Desirable Minimum	2.0m(1)	1.5m(3)		3.25m	3.25m		1.5m(3)	2.0m(1)
Absolute Minimum	1.8m(2)	1.2m(3)		3.0m(4)	3.0m(4)		1.2m(3)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2)Localised narrowing of footway due to street furniture permitted.
(3)Absolute minimum cycle track width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- No TRO required
- Quick to introduce
- Low level of signing
- Solution for use alongside adjacent parking and loading bays, bus stops and across junctions, or on sections of road with narrow traffic lanes

Disadvantages:

- Requires wide kerb to kerb width.
- May require a TRO to keep lane clear of parked and loading vehicles at specific times

Key Criteria:

- Consistent quality is essential, no changes in lane widths, no “gaps”.
- Sufficient road width must be available to cater for other road users outside the cycle lane.
- Parking and loading not permitted in cycle lane and must be provided elsewhere if required. Mandatory cycle lane may change to advisory cycle lane through junctions, at bus stops, and at parking and loading areas.
- Green surfacing to be provided at the beginning and end of mandatory sections of cycle lane, around cycle logos (Diag 1057) Smooth, flat, well-drained and well-maintained surface.
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle lane.
- Maybe Advisory (as shown) or mandatory by use of continuous bounding line on cycle lane side of Diag 1041.1 marking.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£160,000
Upper Cost Estimate	£1,000,000

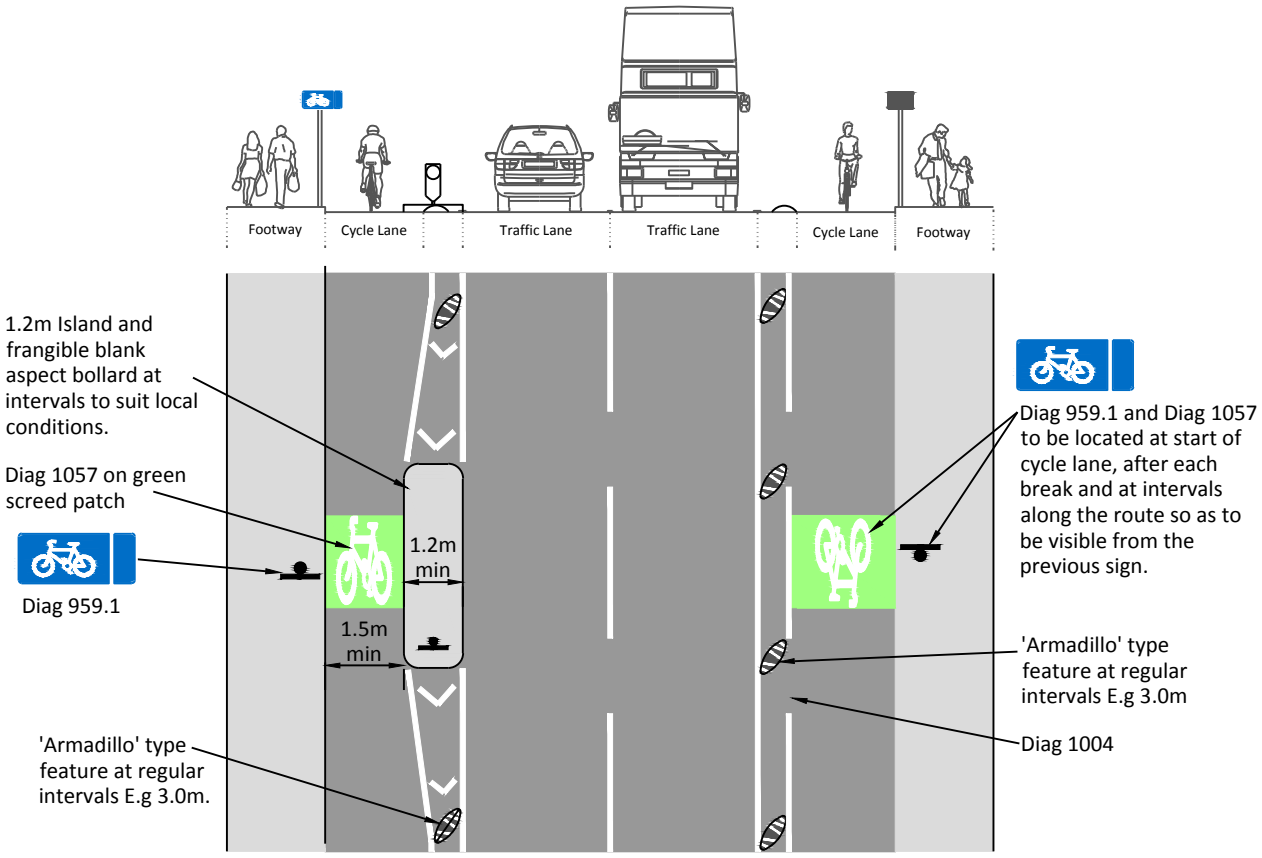
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CL-GE-03	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANE WITH INTERMITTENT 'ARMADILLO' FEATURES (LIGHT SEGREGATION#1)



Target	>2.0m	2.0m	0.6m min	3.5m	3.5m	0.6m min	2.0m	>2.0m
Desirable Minimum	2.0m(1)	1.5m		3.25m	3.25m		1.5m	2.0m(1)
Absolute Minimum	1.8m(2)	1.2m(3)		3.0m(4)	3.0m(4)		1.2m(3)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2)Localised narrowing of footway due to street furniture permitted.
(3)Absolute minimum cycle lane width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- Provides permeability allowing cyclists easy entry and egress.
- 'Armadillo' spacing variable to facilitate property access.
- No TRO required
- Quick to introduce
- Minimises drainage issues

Disadvantages:

- Requires wide kerb to kerb width
- No statutory significance of 'Armadillos'
- Requires Highway Authority to accept risk of liability.

Key Criteria:

- Consistent quality is essential, no changes in lane widths, no “gaps”.
- Sufficient road width must be available to cater for other road users outside the cycle lane.
- Parking and loading not permitted in cycle lane and must be provided elsewhere if required. Mandatory cycle lane may change to advisory cycle lane through junctions, at bus stops, and at parking and loading areas.
- Green surfacing to be provided at the beginning and end of mandatory sections of cycle lane, around cycle logos (Diag 1057)
- Smooth, flat, well-drained and well-maintained surface.
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle lane.
- 24 hour operation.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£200,000
Upper Cost Estimate	£1,000,000

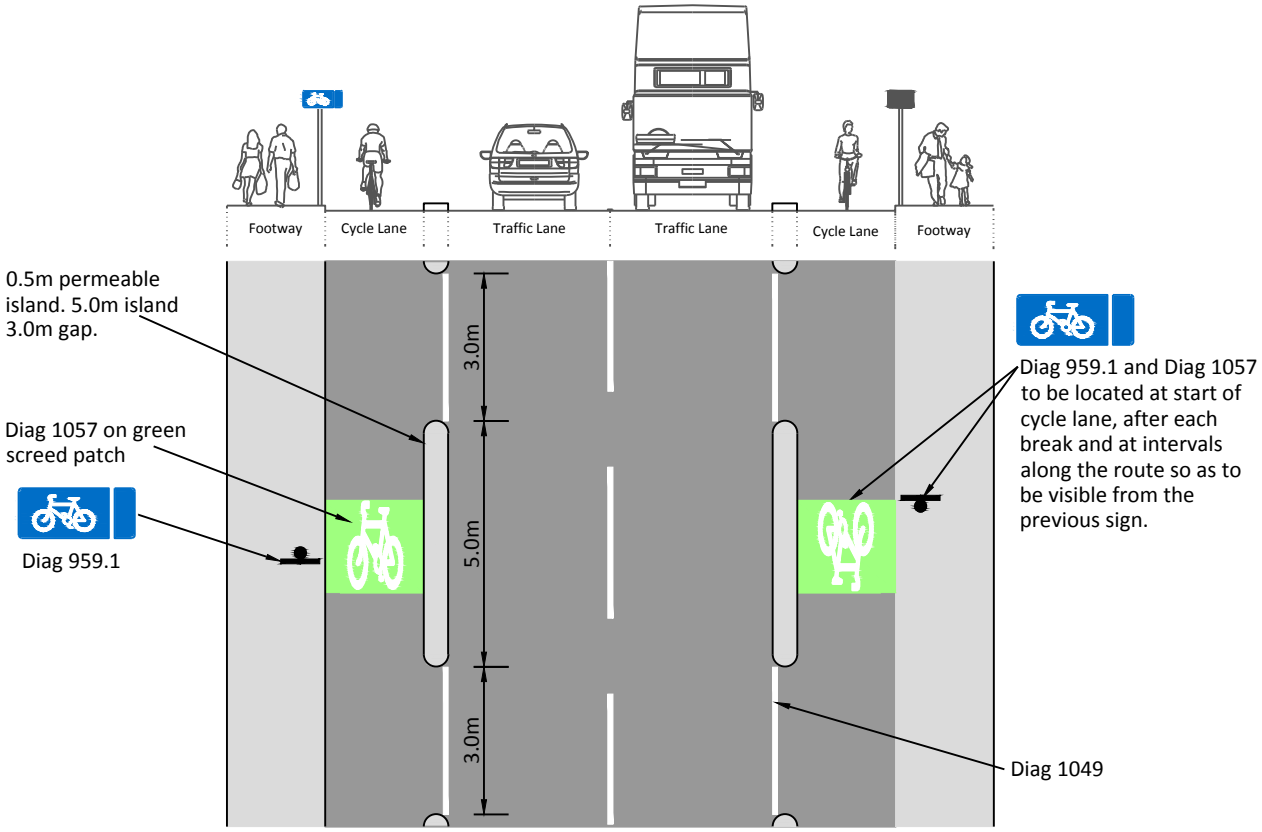
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CL-GE-04	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANE WITH INTERMITTENT TRAFFIC ISLAND (LIGHT SEGREGATION#2)



Target	>2.0m	2.0m	0.5m min	3.5m	3.5m	0.5m min	2.0m	>2.0m
Desirable Minimum	2.0m(1)	1.5m		3.25m	3.25m		1.5m	2.0m(1)
Absolute Minimum	1.8m(2)	1.2m(3)		3.0m(4)	3.0m(4)		1.2m(3)	1.8m(2)

(1) Effective width subject to pedestrian flow.
(2)Localised narrowing of footway due to street furniture permitted.
(3)Absolute minimum cycle lane width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- Provides permeability allowing cyclists easy entry and egress.
- No TRO required
- Quick to introduce
- Minimises drainage issues
- Length of island gap can be adjusted to suit local conditions.

Disadvantages:

- Requires wide kerb to kerb width
- Requires Highway Authority to accept risk of liability.

Key Criteria:

- Consistent quality is essential, no changes in lane widths, no “gaps”.
- Sufficient road width must be available to cater for other road users outside the cycle lane.
- Parking and loading not permitted in cycle lane and must be provided elsewhere if required. Mandatory cycle lane may change to advisory cycle lane through junctions, at bus stops, and at parking and loading areas.
- Green surfacing to be provided at the beginning and end of mandatory sections of cycle lane, around cycle logos (Diag 1057) Smooth, flat, well-drained and well-maintained surface.
- Gullies preferably located in kerb (or a continuous drainage system) and not in cycle lane.
- 24 hour operation.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£200,000
Upper Cost Estimate	£1,000,000

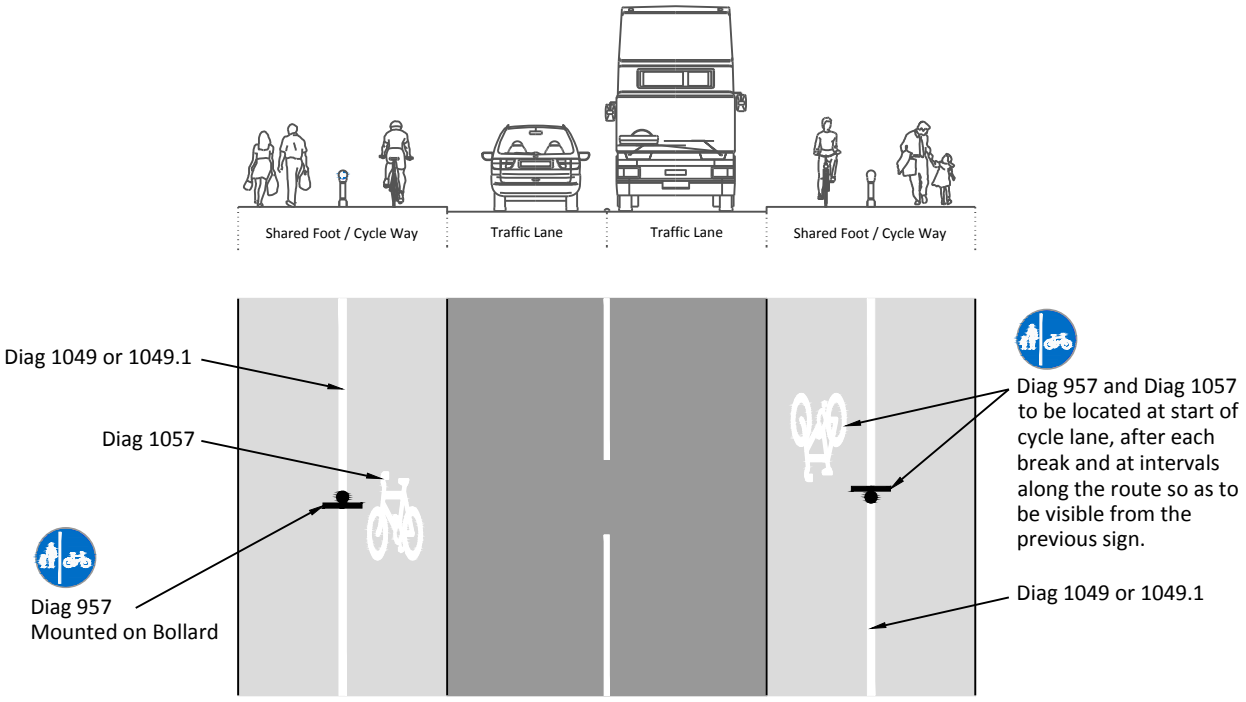
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CL-GE-05	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

SHARED FOOTWAY / CYCLEWAY - SEGREGATED



Target	>5.0m	3.5m	3.5m	>5.0m
Desirable Minimum	5.0m(1)	3.25m	3.25m	5.0m(1)
Absolute Minimum	4.0m(2)	3.0m(4)	3.0m(4)	4.0m(2)

(1) Effective width.
(2) Localised narrowing of footway due to street furniture permitted.
(3) Absolute minimum cycle/ped width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- High profile facility exclusively for cycles
- Provides positive physical segregation from motorised traffic and pedestrians

Disadvantages:

- Has to revert to cycle lanes through junctions
- Sometimes complex solutions for bus stops and adjacent on-street parking or loading areas
- Requires wide highway
- High construction costs

Key Criteria:

- Physical segregation between cyclists and both motorised vehicles and pedestrians.
- 24-hour operation
- Street furniture including lighting columns and signs and supporting structures to be located outside of cycle track
- Consistent quality is essential, no changes in track widths, no “gaps”
- No coloured surfacing
- Smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads / driveway accesses intersect cycle track

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£190,000
Upper Cost Estimate	£1,200,000

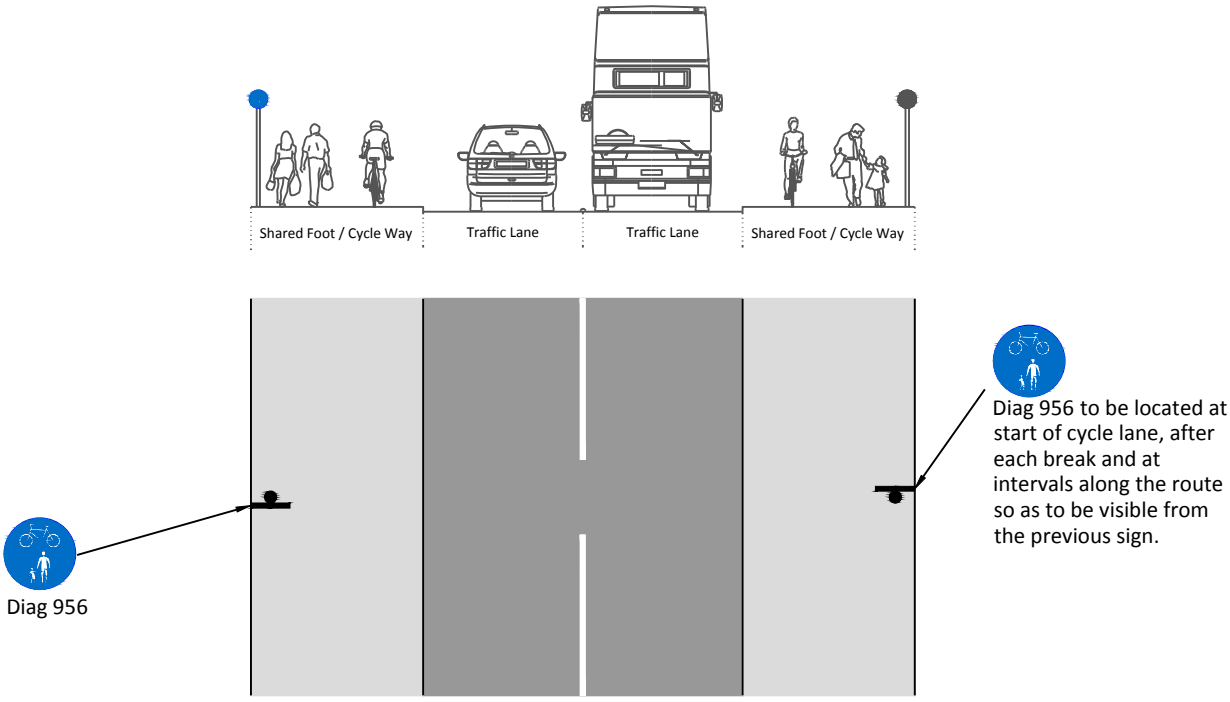
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-SF-GE-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

SHARED FOOTWAY / CYCLEWAY - UNSEGREGATED



Target	>3.0m	3.5m	3.5m	>3.0m
Desirable Minimum	3.0m(1)	3.25m	3.25m	3.0m(1)
Absolute Minimum	2.5m(2)(3)	3.0m(4)	3.0m(4)	2.5m(2)(3)

(1) Effective width.
(2) Localised narrowing of footway due to street furniture permitted.
(3) Absolute minimum cycle/ped width only permitted for low cycle demand (<100/day) over distances < 100m, not on gradients > 7%.
(4) See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- High profile facility exclusively for cycles
- Provides positive physical segregation from motorised traffic and pedestrians

Disadvantages:

- Has to revert to cycle lanes through junctions
- Sometimes complex solutions for bus stops and adjacent on-street parking or loading areas
- Requires wide highway
- High construction costs

Key Criteria:

- Physical segregation between cyclists and both motorised vehicles and pedestrians.
- 24-hour operation
- Street furniture including lighting columns and signs and supporting structures to be located outside of cycle track
- Consistent quality is essential, no changes in track widths, no “gaps”
- No coloured surfacing
- Smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads / driveway accesses intersect cycle track

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£105,000
Upper Cost Estimate	£690,000

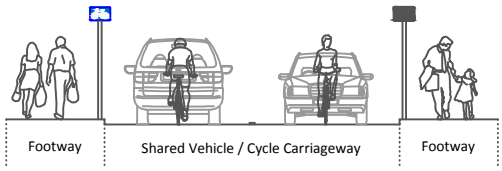
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

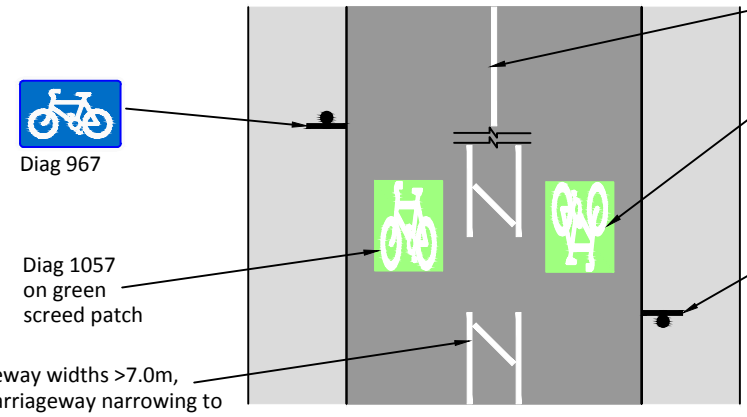
Drawing No:	L-SF-GE-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

QUIET STREET





For carriageway widths <5.5m, carriageway centre marking to be omitted.

Diag 967

Diag 1057
To be located at the start, after each junction and at intervals not greater than 100m.

Diag 1057 on green screed patch

Diag 967 to be located at start of cycle lane, after each break and at intervals along the route so as to be visible from the previous sign.

For carriageway widths >7.0m, Localised carriageway narrowing to be provided.

Target	>2.0m	7.0m max available carriageway	>2.0m
Desirable Minimum	2.0m(1)		2.0m(1)
Absolute Minimum	1.8m(2)		1.8m(2)

(1) Effective width subject to pedestrian flow.
(2) Localised narrowing of footway due to street furniture permitted.

Advantages:

- Solution for narrow streets where there is insufficient width for formal cycle priority
- Provides continuity of designated cycle routes in such situations

Disadvantages:

- Depends on cyclists establishing their position in the lane

Key Criteria:

- Appropriate for roads with carriageway width <7.0m, and subject to 20mph speed limit
- No segregation between cyclists and motorised vehicles - cyclists encouraged to occupy full lane, and traffic follows
- On carriageways less than 5.5m in width, centre line omitted
- Suitable for roads subject to low traffic volumes and little or no through traffic
- Careful detailing required when traffic calming present.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£100,000
Upper Cost Estimate	£680,000

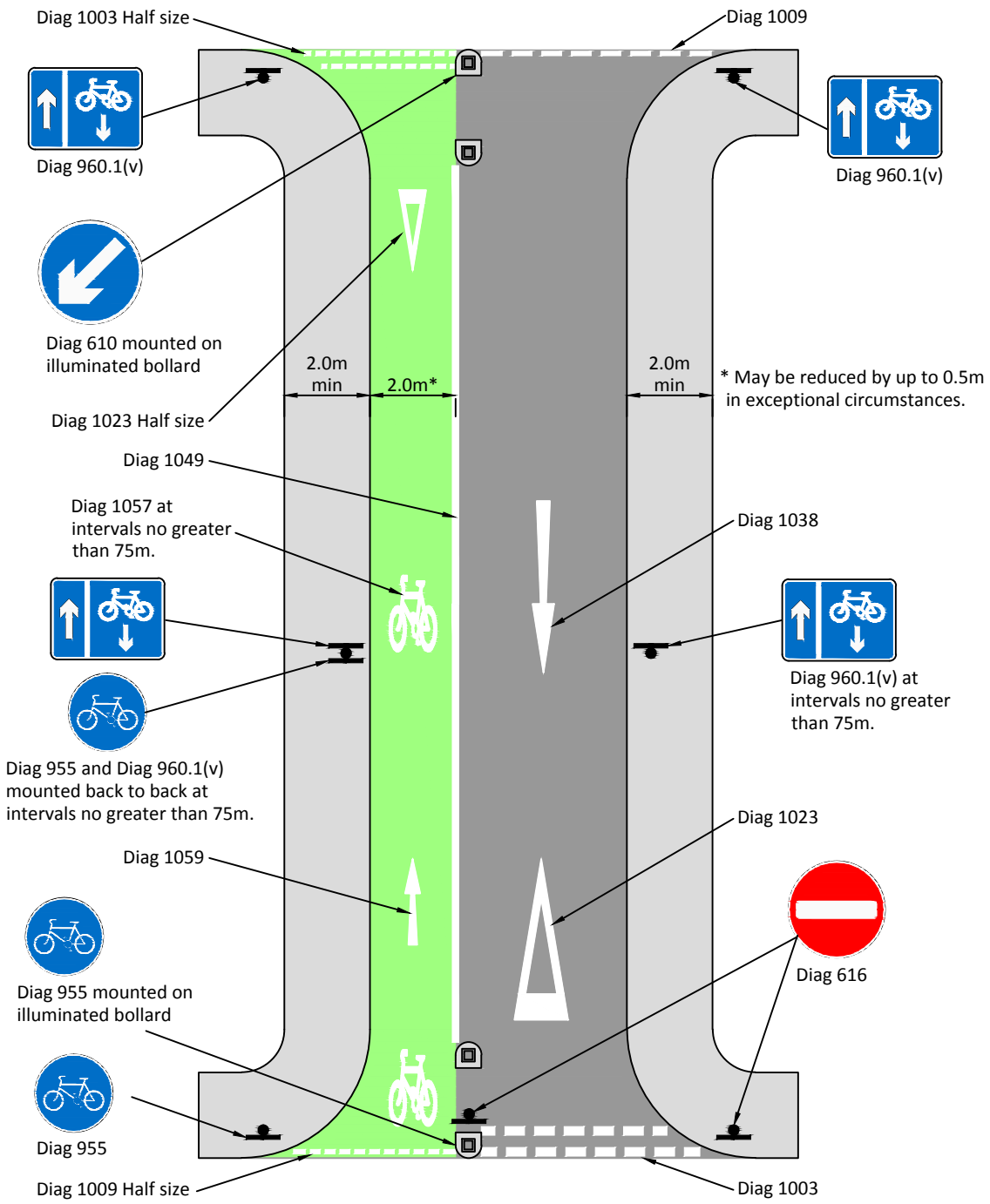
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-QS-GE-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

MANDATORY CONTRAFLOW CYCLE LANE



Key Criteria:

- Use on one-way streets
- May also incorporate with-flow cycle lane on opposite side.
- Can provide improved accessibility and continuity for cycle routes in one-way networks.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£80,000
Upper Cost Estimate	£100,000

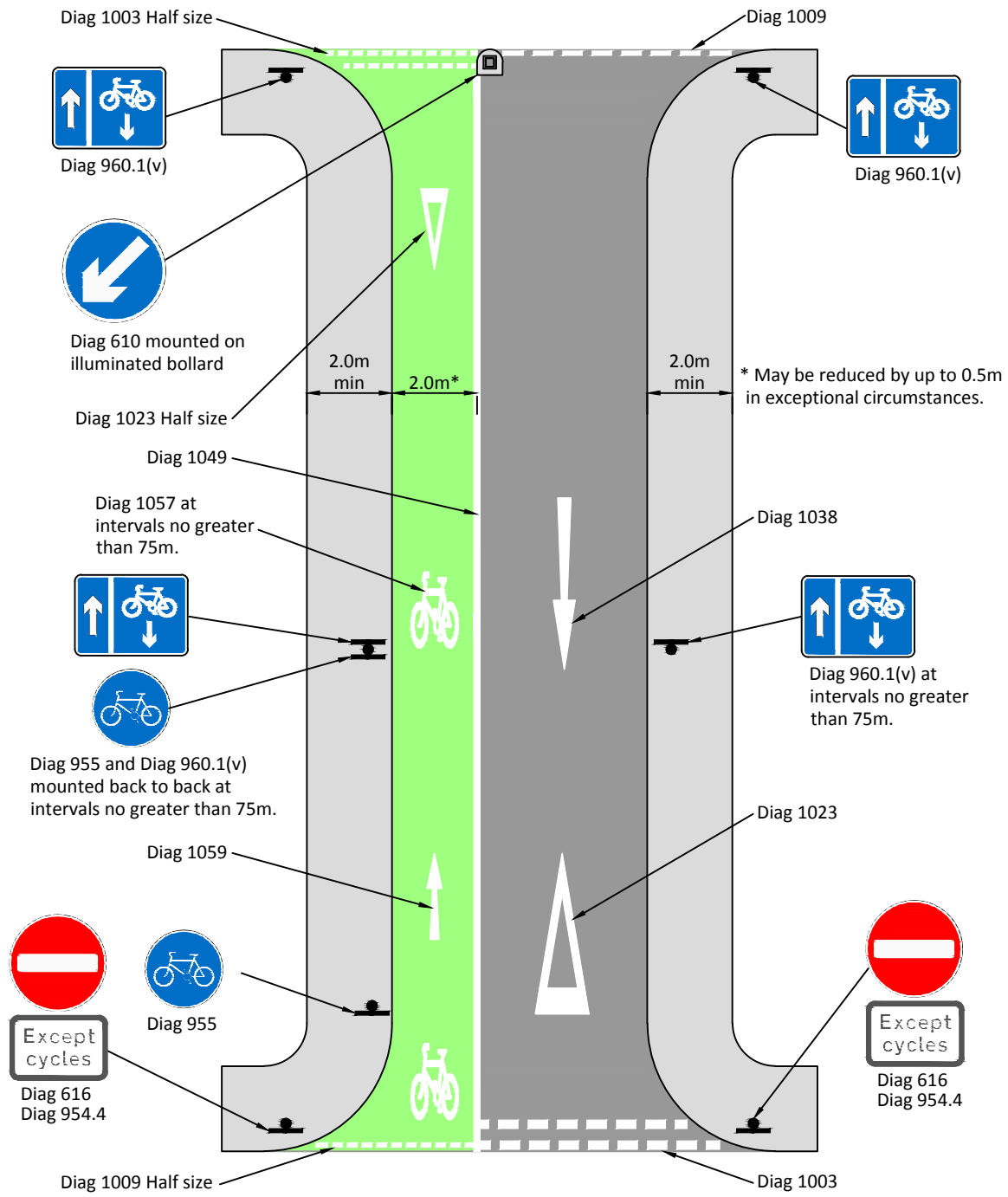
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.

Drawing No:	L-CL-CF-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

MANDATORY CONTRAFLOW CYCLE LANE WITHOUT ENTRY ISLAND



Key Criteria:

- Use on one-way streets
- May also incorporate with-flow cycle lane on opposite side.
- Can provide improved accessibility and continuity for cycle routes in one-way networks.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£80,000
Upper Cost Estimate	£100,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.

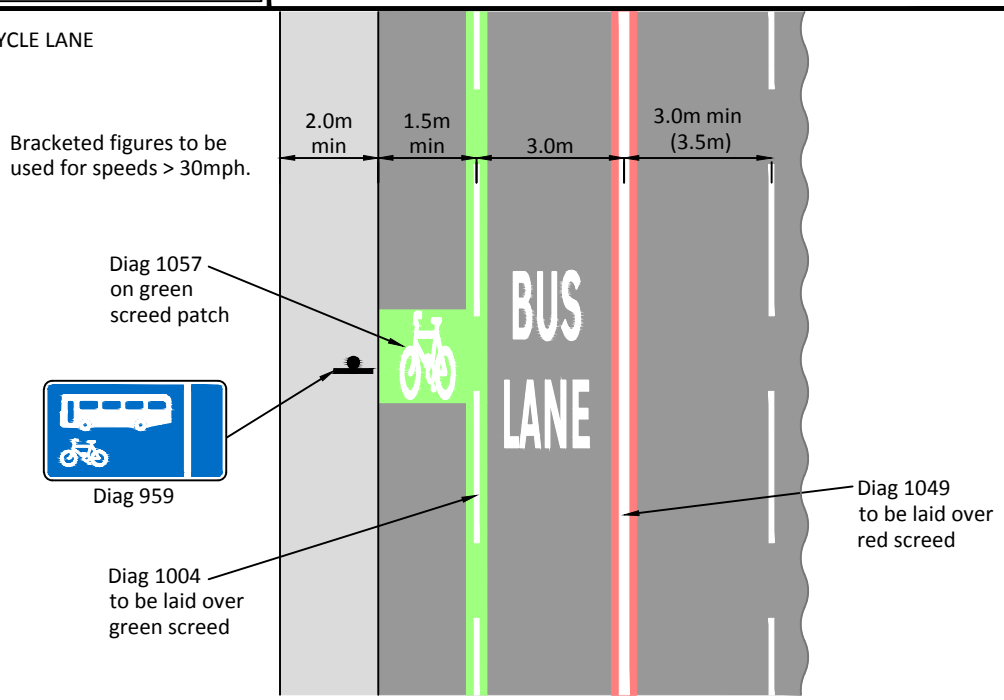
Drawing No:	L-CL-CF-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

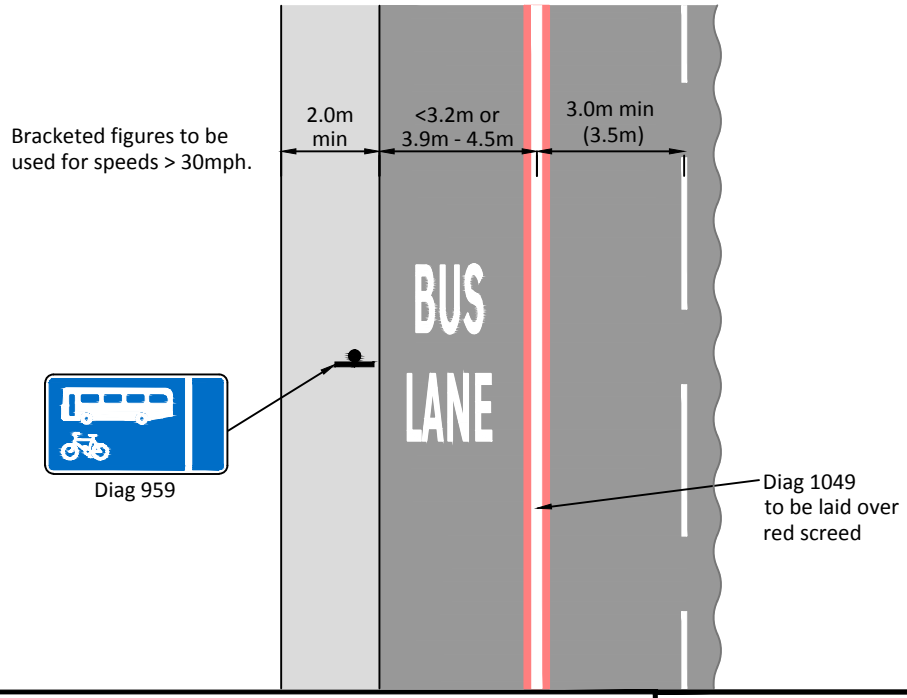
Title:

CYCLE LANE AT BUS LANE

BUS AND CYCLE LANE



BUS LANE



Key Criteria:

- At locations where a 4.5m Bus and Cycle Lane can be provided, a 1.5m advisory cycle lane should be marked adjacent to the kerb. This provides confidence for the cyclists using the lane, and a guide to bus drivers that sufficient clearance is available to overtake within the confines of the Bus Lane.
- At bus stops, the advisory cycle lane marking should be terminated at the bus cage, and re-started beyond. There will be sufficient width between the outer longitudinal edge of the bus cage marking and the outer bounding line of the Bus Lane to provide a passing lane for cyclists when the bus cage is occupied.
- If available road width constrains Bus Lane width, then the maximum width of the Bus Lane is 3.2m. This prevents users from misjudging clearances when overtaking. Cycles are still allowed to use the Bus Lane
- At bus stops, the advisory cycle lane marking should be terminated at the bus cage, and re-started beyond. As the gap between bus cage and bounding line is likely to be narrow (about 0.5m), consideration should be given to local widening of the Bus Lane through the bus stop to provide a 1.5m passing lane for cyclists.

Typical Costs:

Work Zone Length	1000m
Lower Cost Estimate	£200,000 / (£130,000)
Upper Cost Estimate	£1,200,000 / (£780,000)

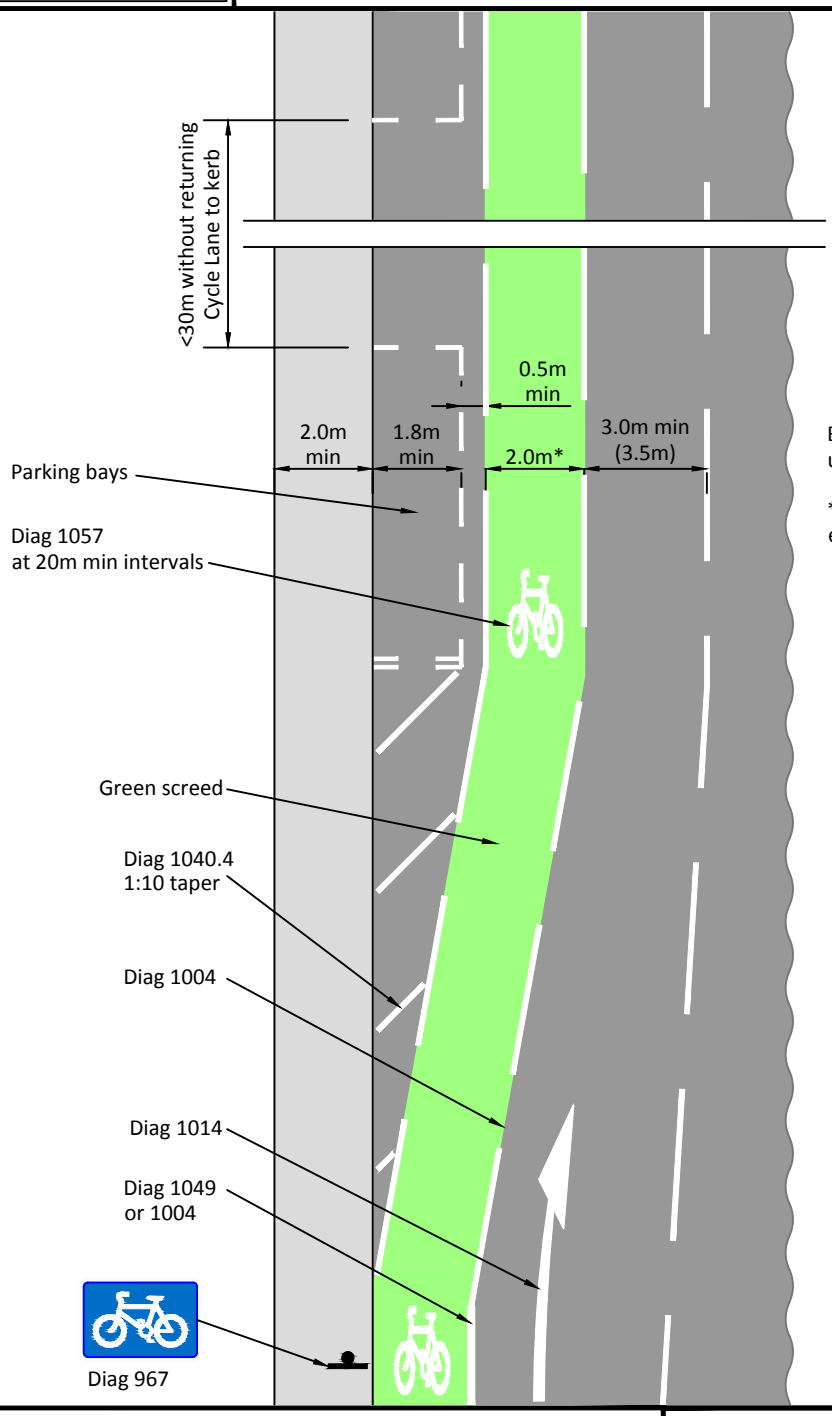
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Bracketed figure are Bus Lane Only.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-BL-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

CYCLE LANE AT PARKING BAYS



Bracketed figures to be used for speeds > 30mph.

*May be reduced by up to 0.5m in exceptional circumstances

Key Criteria:

- Suitable where there is high kerbside activity
- Loading bays to be 2.0m minimum width

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£15,000
Upper Cost Estimate	£80,000

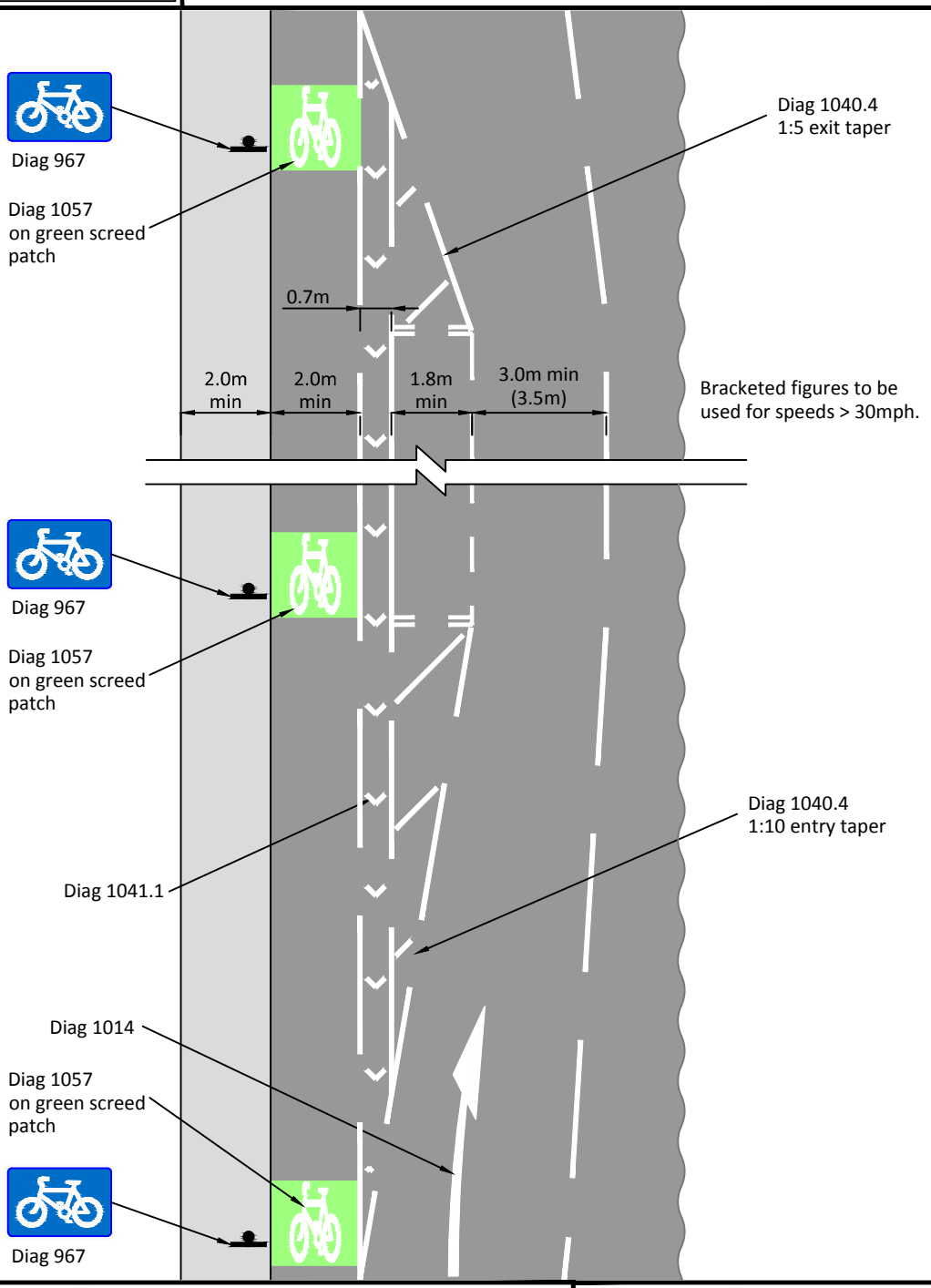
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-PK-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

CYCLE LANE AT PARKING BAYS



Key Criteria:

- Permeable barriers (e.g. 'armadillos' may be installed within the Diag 1004 chevron-hatched areas at 6m centres subject to DfT approval
- Suitable where there is low kerbside activity.

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£15,000
Upper Cost Estimate	£105,000

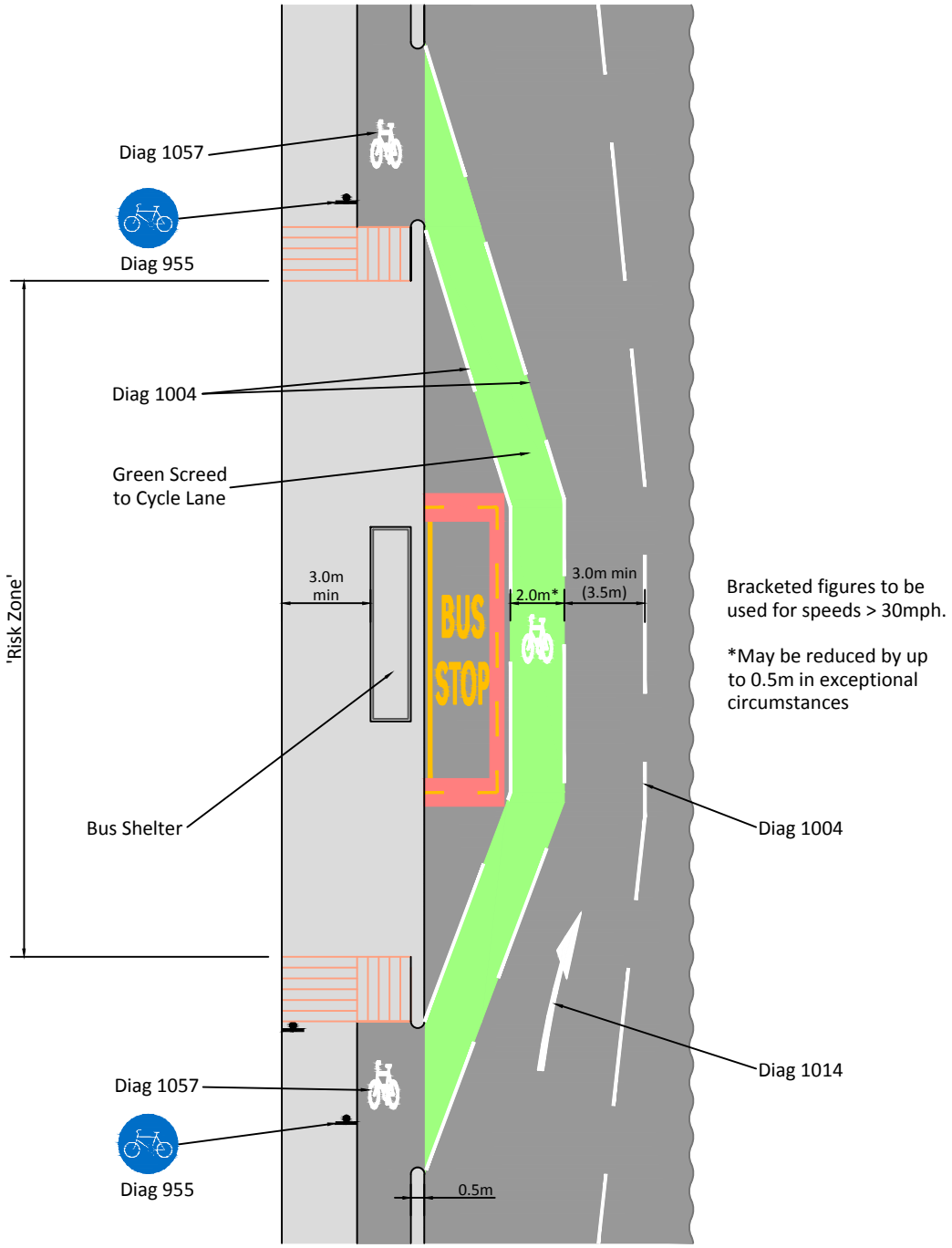
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-PK-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACK AT A BUS STOP



Bracketed figures to be used for speeds > 30mph.

*May be reduced by up to 0.5m in exceptional circumstances

Key Criteria:

- Shared footway/cycleway behind bus shelter may be segregated or unsegregated according to levels of pedestrian and cycle use
- On-carriageway cycle lane may simply terminate at the bus cage and re-start beyond if the bus stop has a low frequency of occupancy (less than 30 buses per hour)
- Careful management of pedestrians / cycle conflict required within the 'Risk Zone'.

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£40,000
Upper Cost Estimate	£155,000

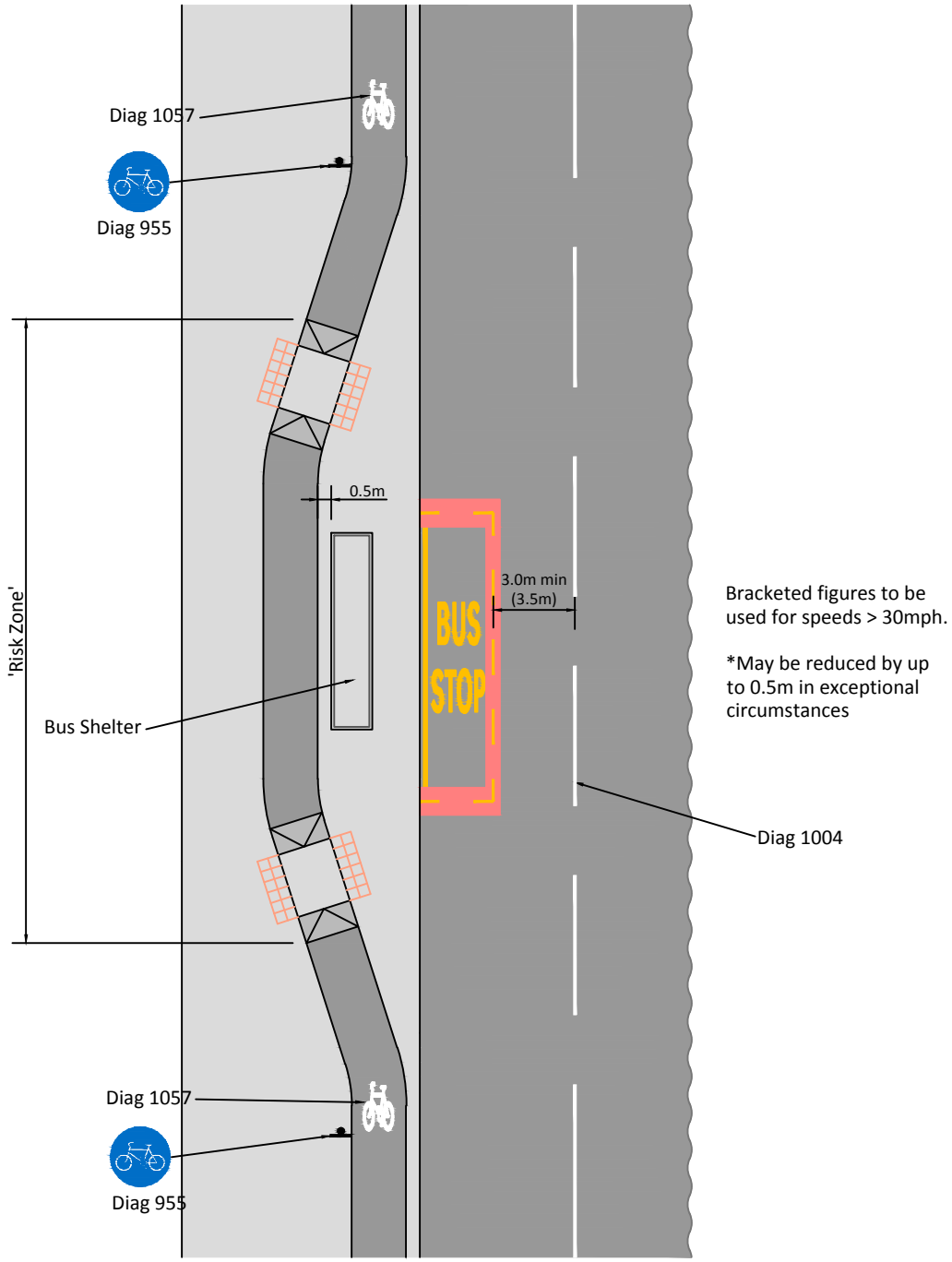
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CT-BS-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACK AT A FLOATING BUS STOP



Bracketed figures to be used for speeds > 30mph.

*May be reduced by up to 0.5m in exceptional circumstances

Key Criteria:

- Shared footway/cycleway behind bus shelter may be segregated or unsegregated according to levels of pedestrian and cycle use

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£50,000
Upper Cost Estimate	£200,000

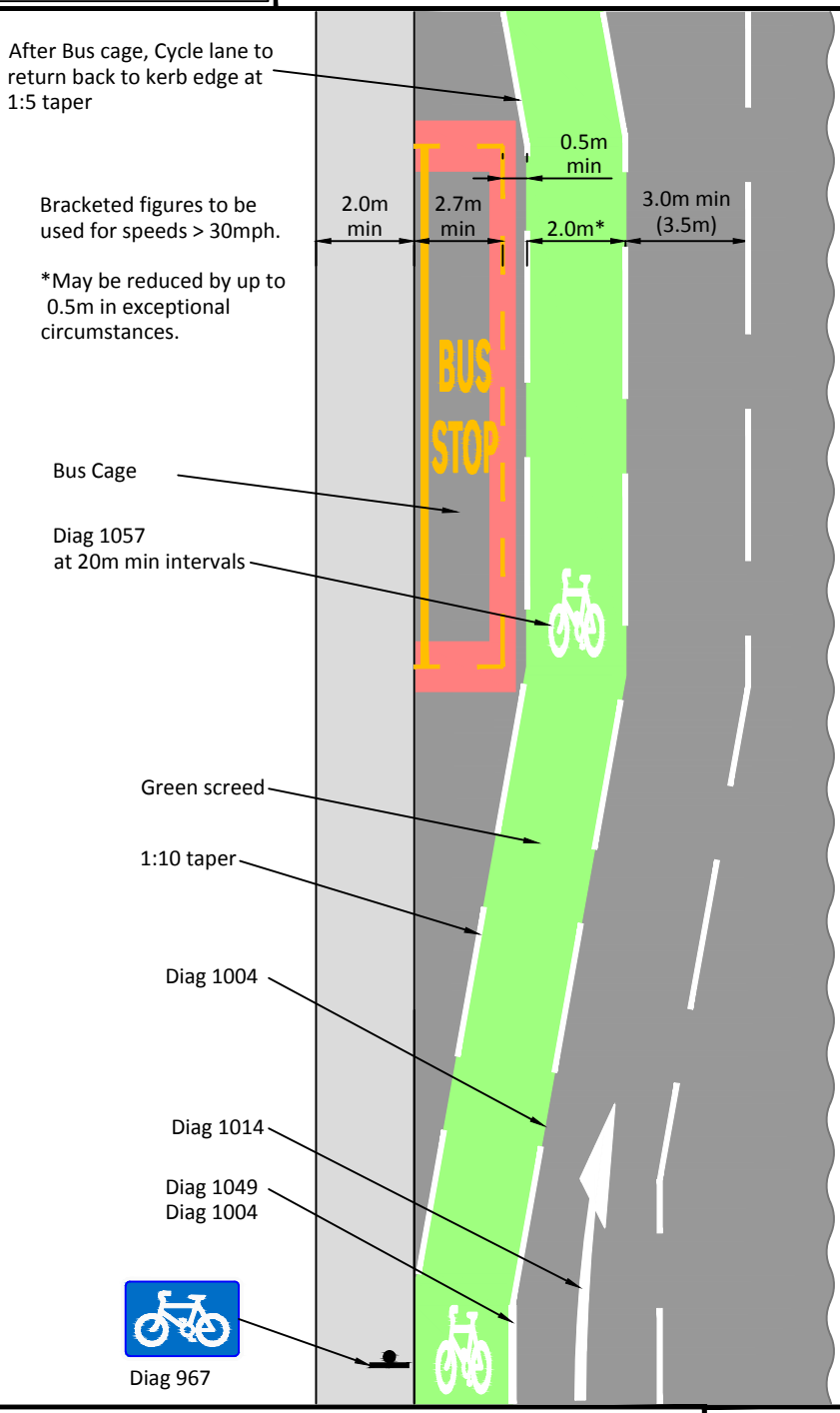
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CT-BS-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

CYCLE LANE AT BUS STOP



Key Criteria:

- Use where bus stop has high frequency of occupancy (30 buses per hour or more, or occupied for 30 mins per hour or more)

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£20,000
Upper Cost Estimate	£120,000

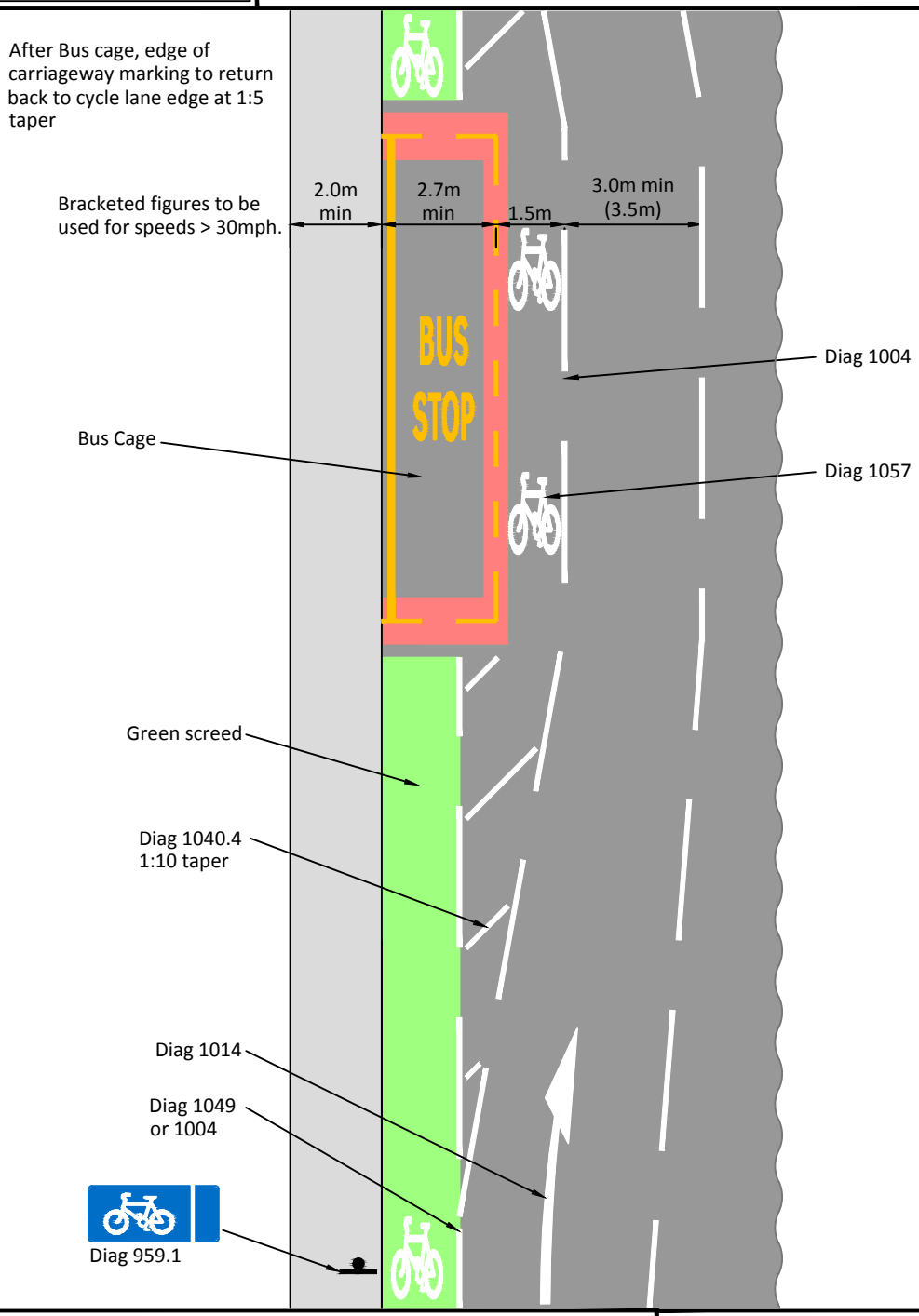
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-BS-01	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

CYCLE LANE AT BUS STOP



Key Criteria:

- Use where bus stop had low frequency of occupancy (less than 30 buses per hour, or occupied for less than 30 minutes per hour)

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£20,000
Upper Cost Estimate	£100,000

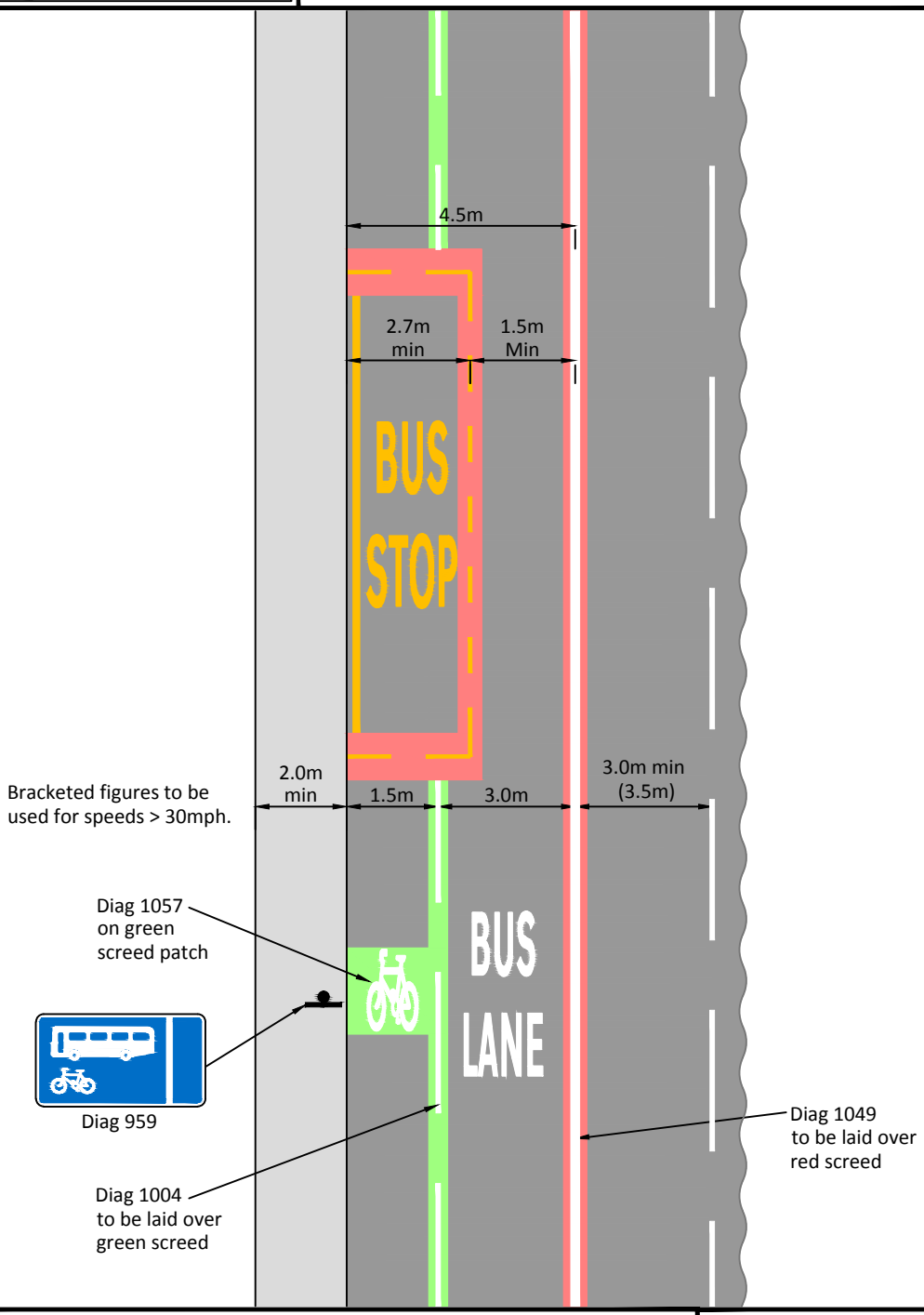
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-BS-02	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

CYCLE LANE AT BUS STOP WITHIN BUS LANE



Key Criteria:

- For use on Bus Lanes of 4.5m width.
- See L-CL-BL-01.

Typical Costs:

Work Zone Length	75m
Lower Cost Estimate	£15,000
Upper Cost Estimate	£75,000

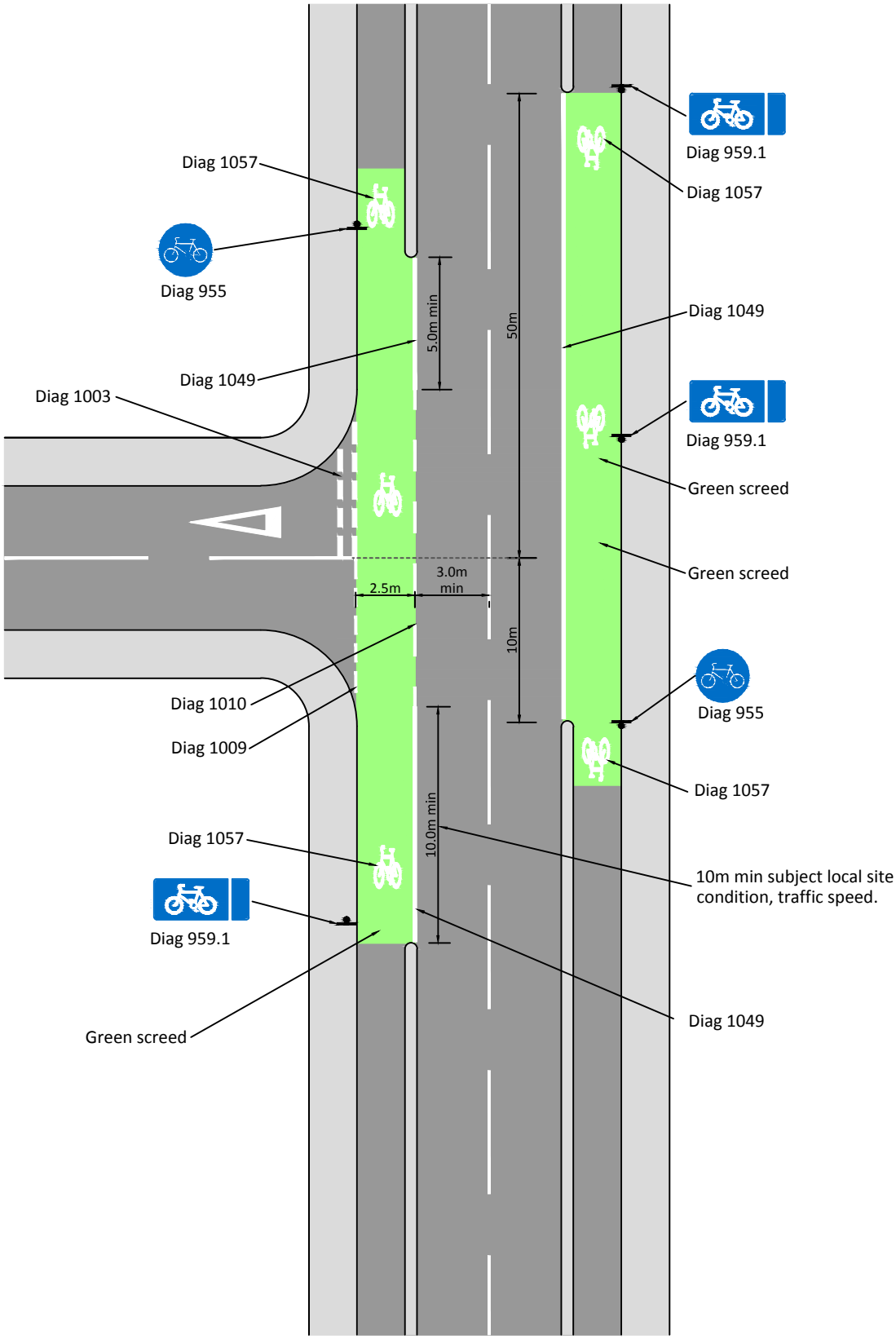
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-BS-03	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACKS AT SIDE ROAD



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£20,000
Upper Cost Estimate	£80,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Notes:

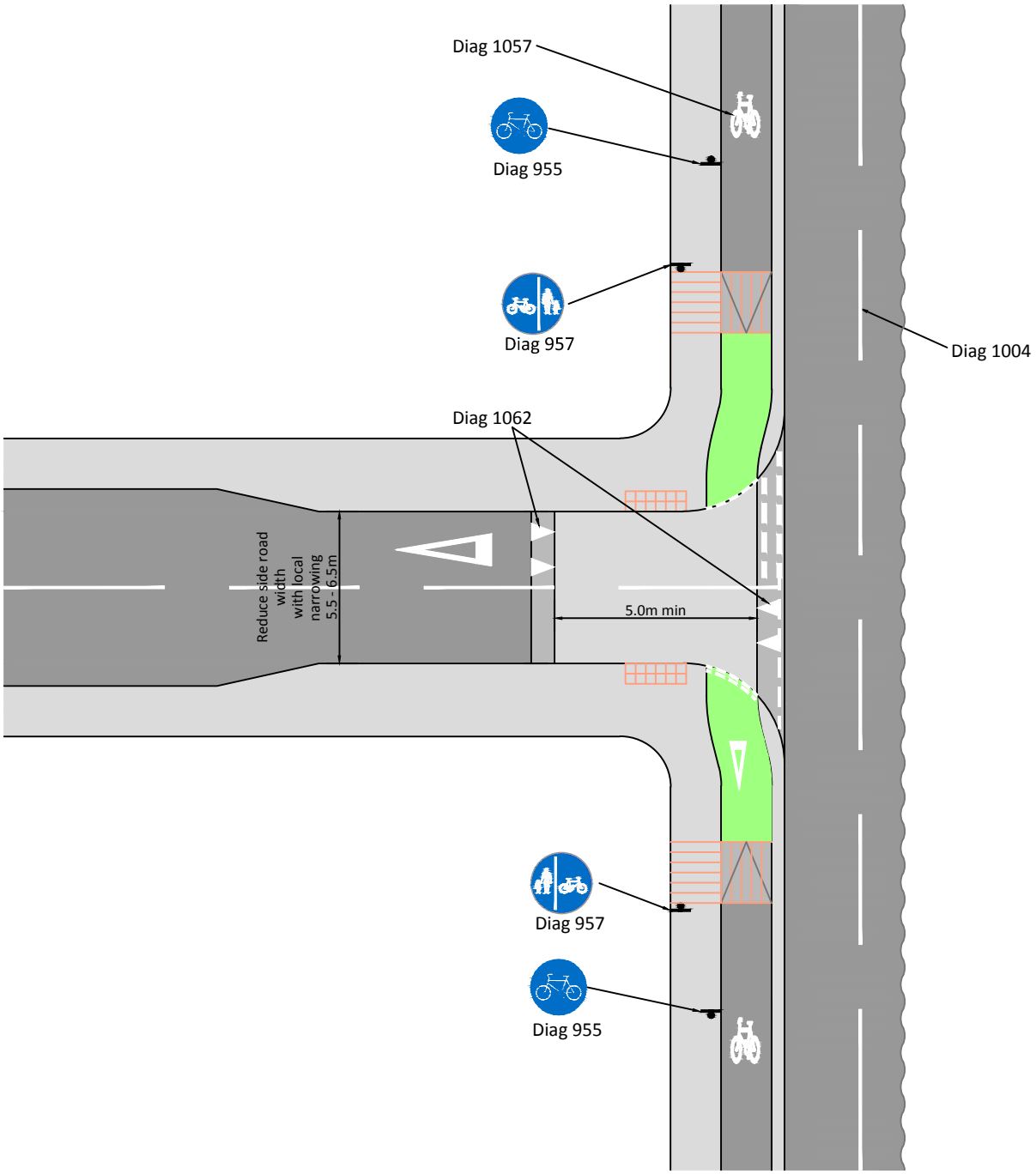
- Cycle Track details shown on L-CT-GE-01.

Drawing No:	J-CT-GE-01	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACK AT SIDE ROAD - RAISED JUNCTION



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£20,000
Upper Cost Estimate	£65,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Notes:

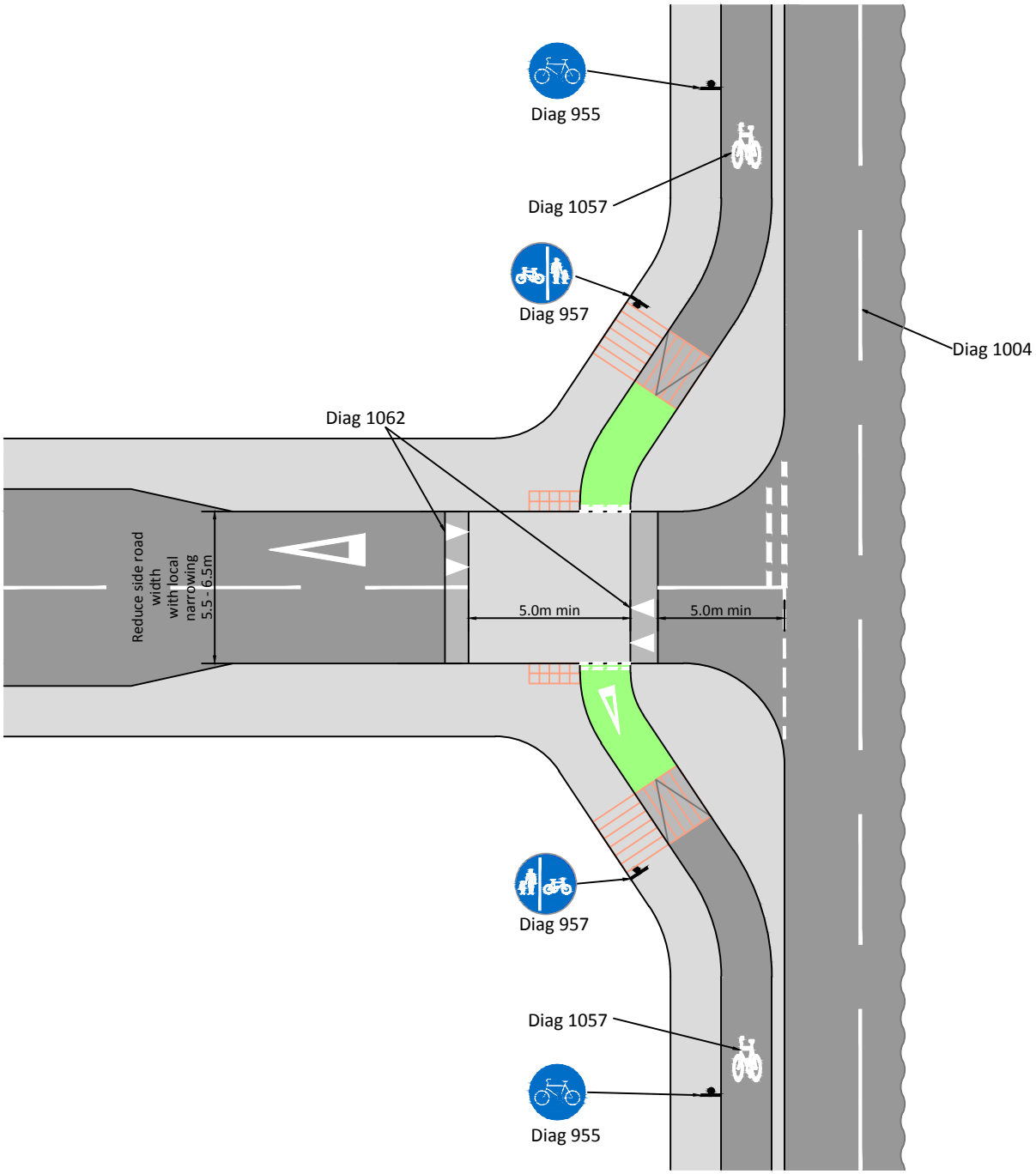
- Cycle Track details shown on L-CT-GE-02.
- To be used when there is a low vehicular demand at the side road <50 veh / hr and / or when the side road is one way out.

Drawing No:	J-CT-GE-02	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACK AT SIDE ROAD - RAISED JUNCTION WITH 5.0m SETBACK



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£30,000
Upper Cost Estimate	£80,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Notes:

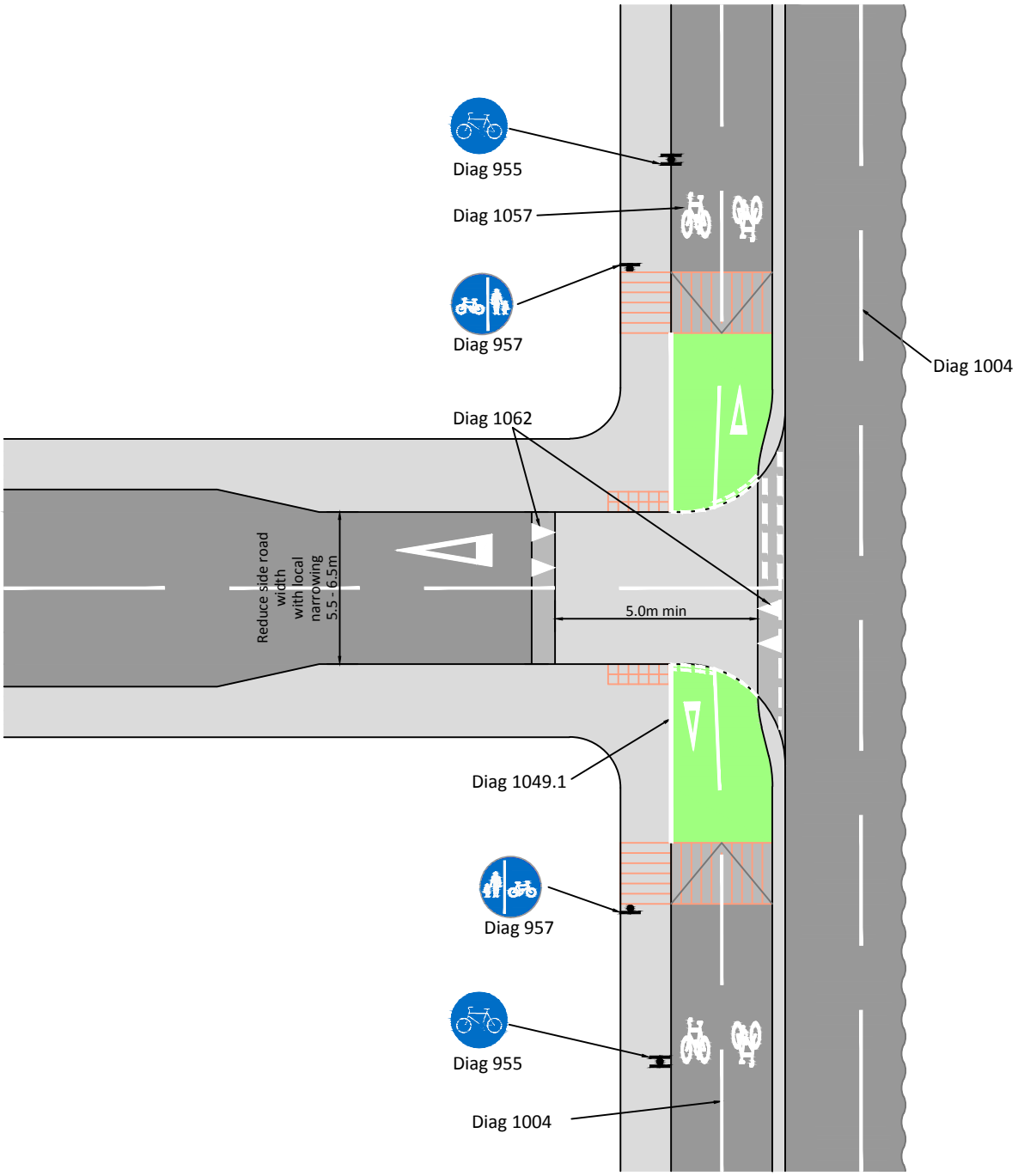
- Cycle Track details shown on L-CT-GE-02.
- To be used when there is a higher vehicular demand on the side road. (<50 Veh / Hr)

Drawing No:	J-CT-GE-03	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

TWO-WAY CYCLE TRACK AT SIDE ROAD - RAISED JUNCTION



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£20,000
Upper Cost Estimate	£65,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Notes:

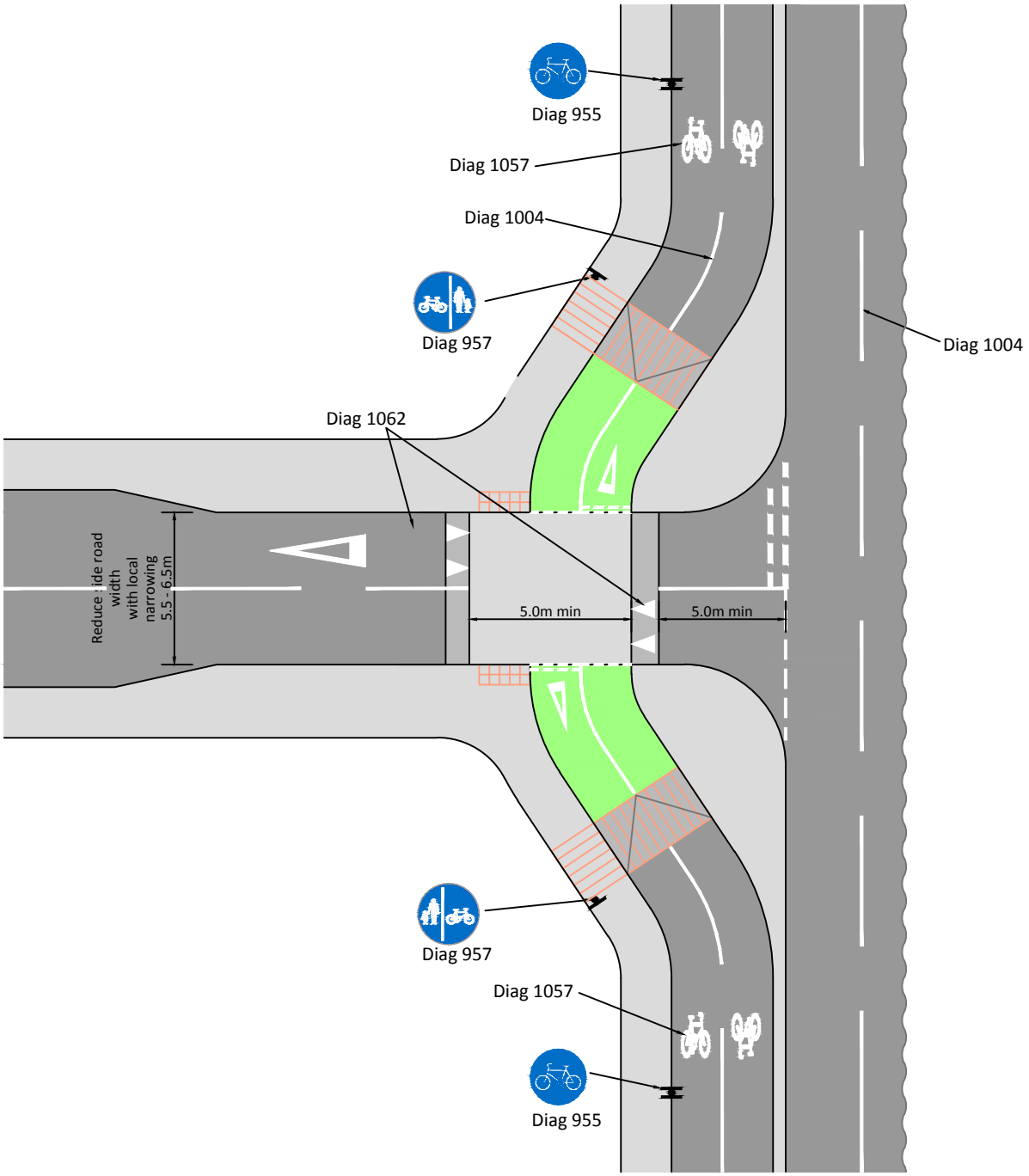
- Cycle Track details shown on L-CT-GE-02.
- To be used when there is a low vehicular demand at the side road <50 veh / hr and / or when the side road is one way out.

Drawing No:	J-CT-GE-04	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

TWO-WAY CYCLE TRACK AT SIDE ROAD - RAISED JUNCTION WITH 5.0m SETBACK



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£30,000
Upper Cost Estimate	£80,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Notes:

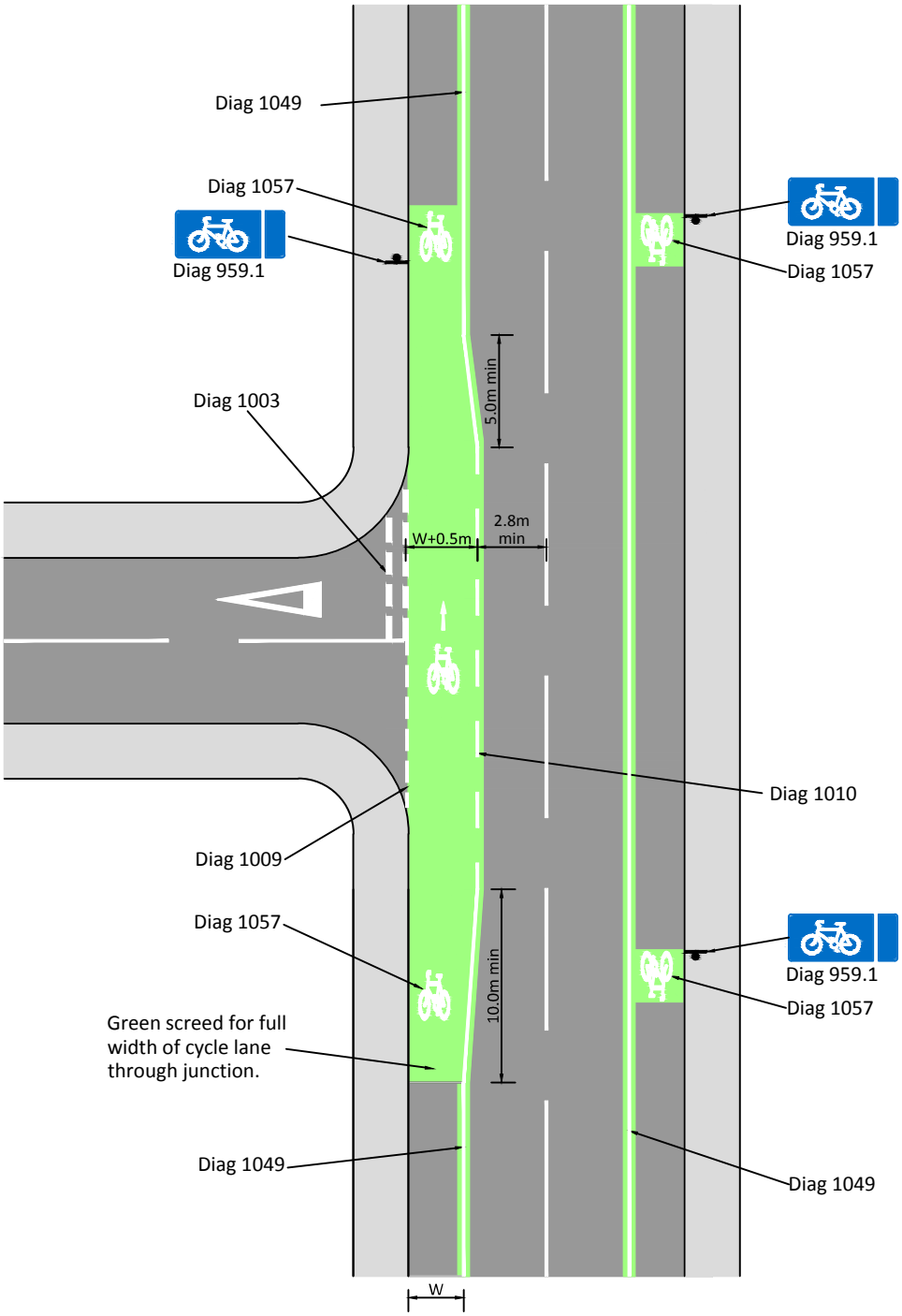
- Cycle Track details shown on L-CT-GE-02.
- To be used when there is a higher vehicular demand on the side road. (<50 Veh / Hr)

Drawing No:	J-CT-GE-05	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANE AT SIDE ROAD



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£10,000
Upper Cost Estimate	£50,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Notes:

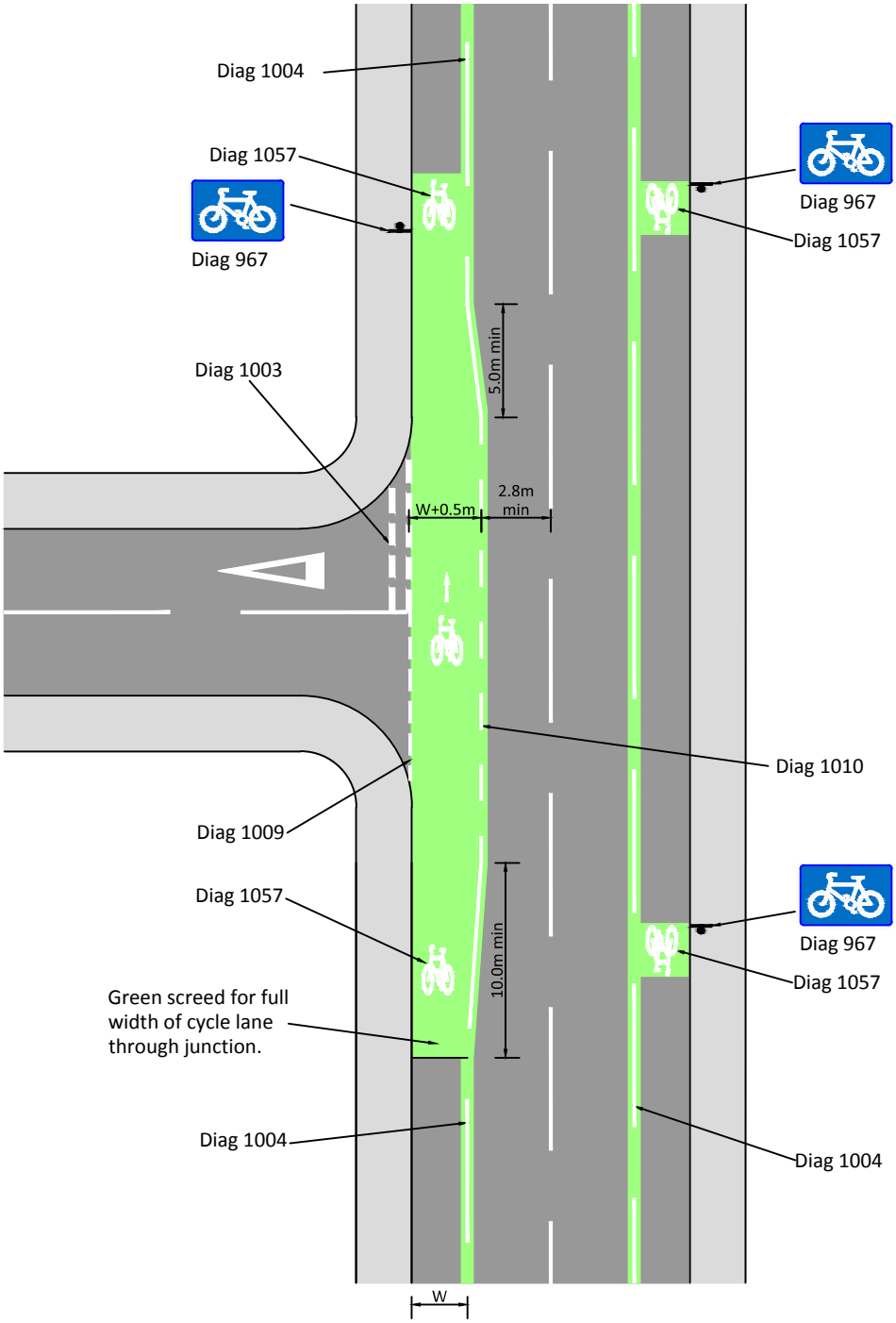
Cycle Lane details shown on L-CL-GE-02

Drawing No:	J-CL-GE-01	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

ADVISORY CYCLE LANE AT SIDE ROAD



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£10,000
Upper Cost Estimate	£50,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Notes:

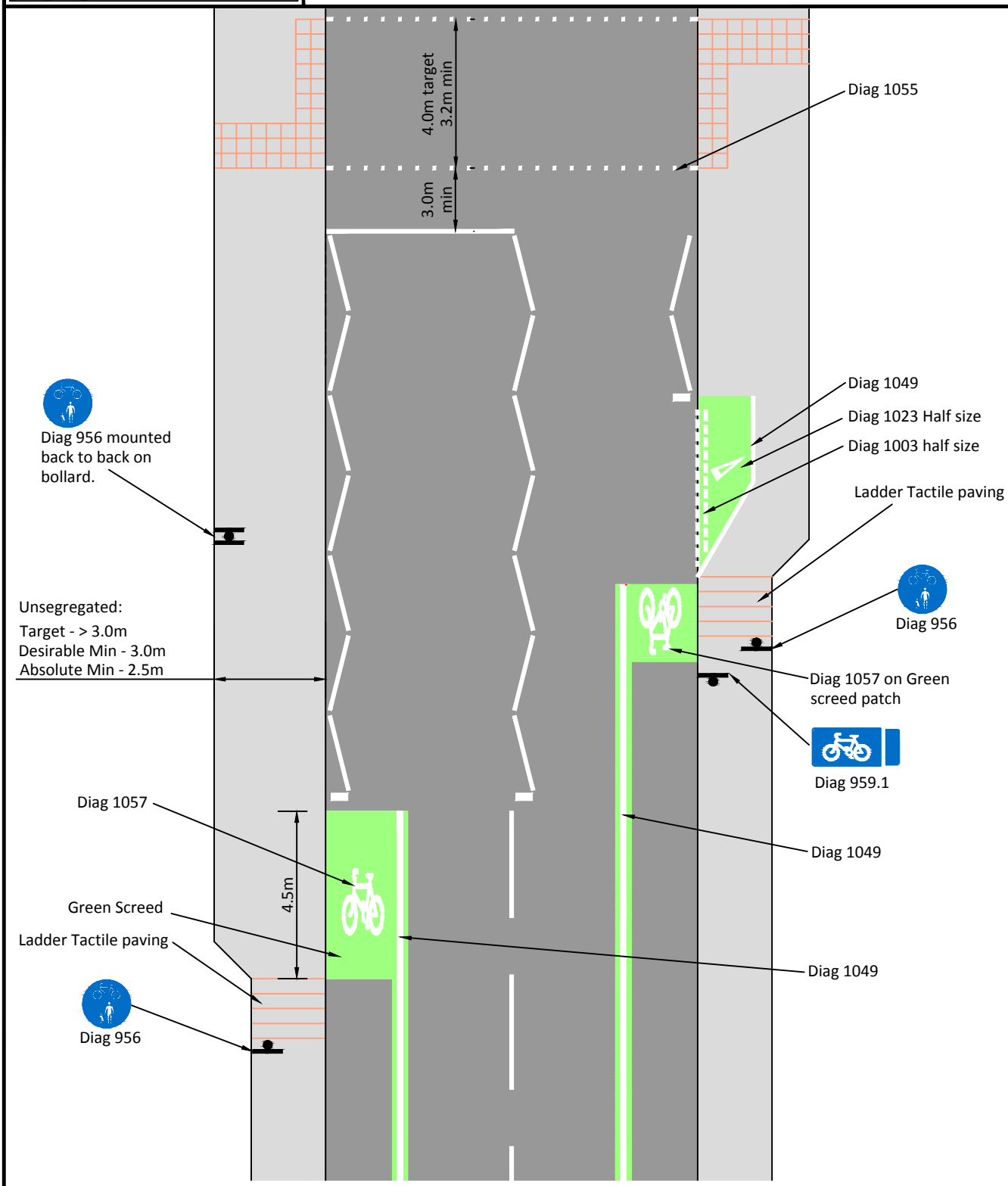
Cycle Lane details shown on L-CL-GE-03

Drawing No:	J-CL-GE-02	Rev:
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

ONE-WAY MANDATORY CYCLE LANE AT TOUCAN CROSSING



Typical Costs:

Work Zone Length	50m
Lower Cost Estimate	£60,000 / (£30,000)
Upper Cost Estimate	£120,000 / (£85,000)

- Cost estimates are indicative only and can vary significantly depending upon local site conditions. (Bracketed figures not including crossing facility)
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Notes:

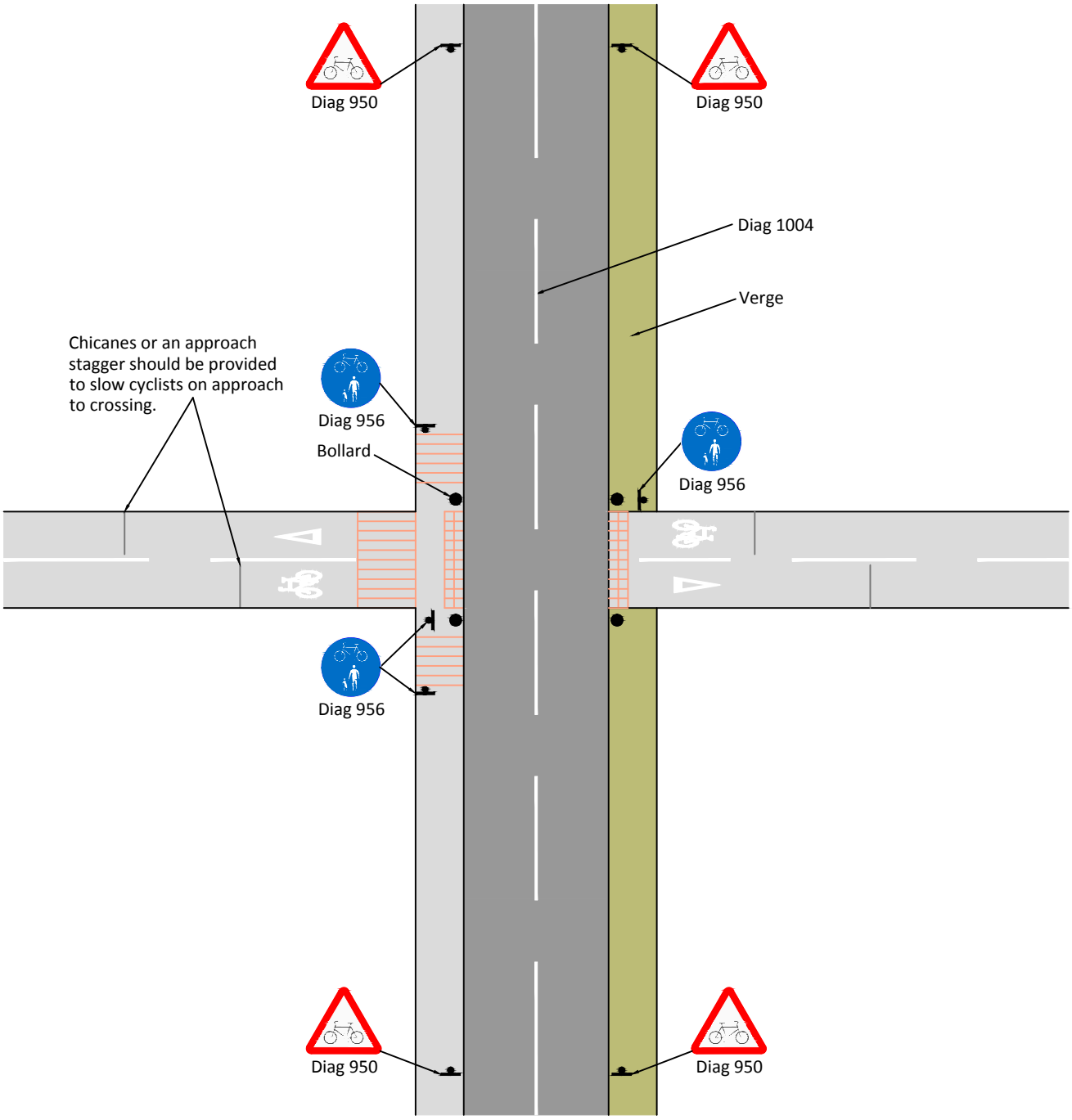
- Applies to mandatory and advisory cycle lanes
- Cycle Lane details shown on L-CL-GE-02 (mandatory) and L-CL-GE-03 (advisory)

Drawing No:	C-CL-GE-01	Rev:
Lead Section:	CROSSINGS	

Transport for Greater Manchester

Title:

CYCLE CROSSING AT A MAJOR ROAD



Typical Costs:

Work Zone Length	100m
Lower Cost Estimate	£6,000
Upper Cost Estimate	£8,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Cost estimate assume cycle facility provisions on both sides of the carriageway.
- Cost estimate excludes the construction of cycle track facilities.

Notes:

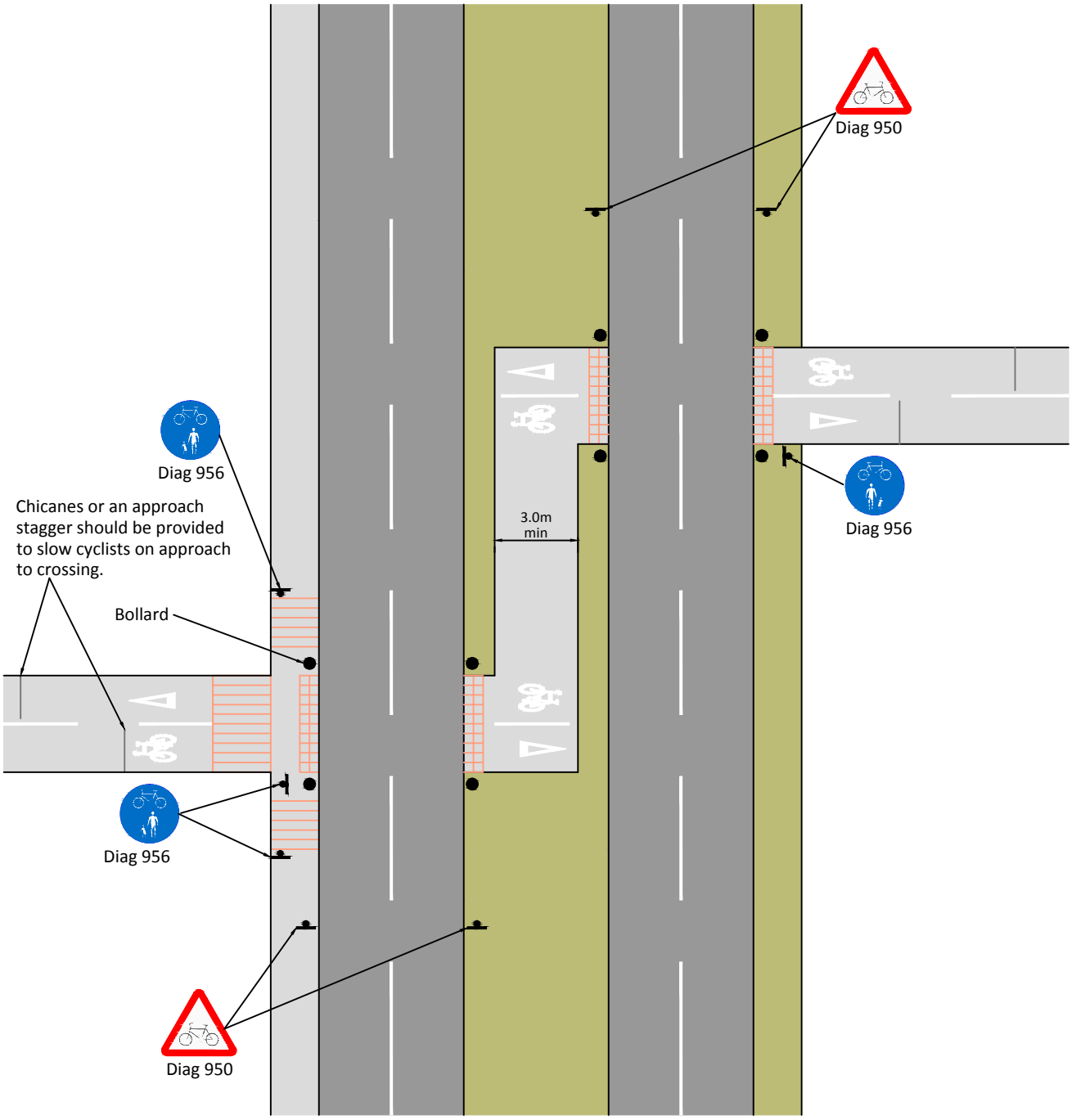
- Layout indicates options for urban areas (with footways) and rural areas (with verges).

Drawing No:	C-CP-GE-01	Rev:
Lead Section:	CROSSINGS	

Transport for Greater Manchester

Title:

CYCLE CROSSING AT DUAL CARRIAGEWAY



Typical Costs:

Work Zone Length	100m
Lower Cost Estimate	£6,000
Upper Cost Estimate	£8,000

- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Cost estimate assume cycle facility provisions on both sides of the carriageway.
- Cost estimate excludes the construction of cycle track facilities.

Notes:

- Layout indicates options for urban areas (with footways) and rural areas (with verges).

Drawing No:	C-CP-GE-02	Rev:
Lead Section:	CROSSINGS	