Transport for Greater Manchester

Greater Manchester Cycling Design Guidance

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better bycycle

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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)
2.1	Amendments following discussions with other CCAG Cities, TfL, DfT and GMDDRG	NB (AECOM)	21-Mar-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 document (hereafter GMCDG) has been developed in collaboration with the Greater Manchester District Authority partners. It is recognised that the GMCDG 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 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	*To be confirmed as QoS evaluation framework evolves*
Local	Cycle routes within local zones and/or connections to the Primary cycle route network	*To be confirmed as QoS evaluation framework evolves*

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 in the UK include:

- ‘light segregation’ of cyclists and general traffic, typically through the deployment of intermittent physical features / separators such as splitter islands, poles, or bolt-on features such as ‘armadillos’ or similar, all reinforced with appropriate line 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.

Furthermore, 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 relevant regulations.

Greater Manchester District Authorities are encouraged to seek area wide and site specific authorisation from the DfT for innovative cycle facilities where considered beneficial to cyclists and in keeping with the overarching design criteria set out in Section 1.2.

1.6 Purpose of this document

The purpose of the GMCDG 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 Guidance
- **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.

It is reiterated that the GMCDG is 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 District 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 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 3 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 (two-way).
2. vph = typical number of motor vehicles in a typical morning peak hour (two-way).
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

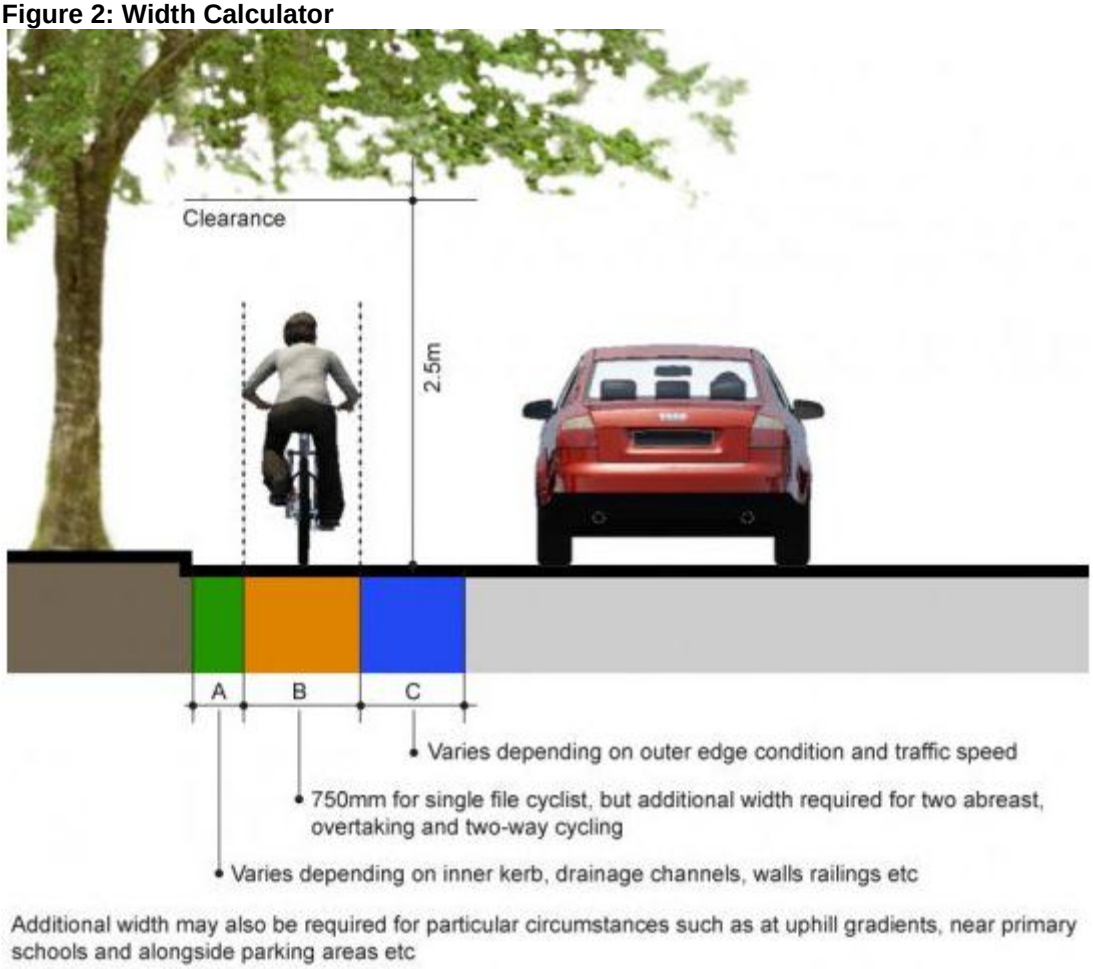
Factor	On-road or off-road?
High traffic volume/speed routes	Off-road generally preferred, but see next item
Large number of side road junctions or property accesses along route	Make on-road more attractive, as it reduces the potential for conflict at these locations
Busy pedestrian traffic along the 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 provide the appropriate 'effective width' for cyclists, taking into account clearance from static objects on the inside edge (usually a kerb) and, typically, from moving objects on the outside edge (usually general traffic). Taken from the Irish National Cycle Manual, **Figure 2** illustrates these three component elements as 'A' for the inside edge clearance; 'B' for the effective width for cycling; and 'C' for the outside edge clearance.

Figure 2: Width Calculator



Source: Irish National Cycle Manual, 2011

It is widely recognised that 750mm is the standard minimum width requirement for 'B' for a single file cyclist. Similarly, a minimum clearance on the inside edge of 250mm is recommended in the Irish National Cycle Manual, whilst a minimum clearance on the outside edge of 600mm is recommended in the London Cycle Design standards where the clearance is to moving traffic. Adding these three component elements together results in a minimum total width requirement of 1.6m from kerb face to the outside edge of the cycle lane road marking. Because width dimensions are measured from the kerb face to the centreline of the road marking separating the cycle lane from the rest of the carriageway, assuming a 150mm width Mandatory cycle lane road marking (Diag 1049), this results in a

cycle lane width of 1600mm minus the half width (75mm) of the road marking, resulting in a total width requirement of 1.525m. Reflecting the above calculations, a standard minimum width for a cycle lane is widely recognised as 1.5m and it is for this reason that 1.5m has been identified as the absolute minimum width for cycle lanes within this Greater Manchester Cycling Design Guidance.

Details of Target, Desirable Minimum and Absolute Minimum widths for various types of cycle link facilities are shown in **Table 5** and arranged in descending order of highway width required in **Table 6**. In order to provide the potential for overtaking within the confines of the cycle track / lane, a minimum effective width of 1.25m is recommended.

Designers are encouraged to seek opportunities to maximise the effective width for cyclists by ensuring reduced kerb heights (50mm or lower) between the cycle lane or track and the adjacent footway, verge or separator to general traffic such that cyclists can cycle closer to the kerb without fear of catching the underside of the pedal. Side draining gullies with a uniform camber also provide more effective width for cycling than surface gullies / drainage channels.

The absolute minimum general traffic lane width is 3.0m on roads subject to a 30mph speed limit. On faster roads or on roads where HGV levels exceed 8% of all traffic, it is recommended that this should be increased to a minimum width of 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**).

Target, desirable minimum and absolute minimum widths for different cycle links facilities on roads with a speed limit of 30mph 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.

Table 5: Width requirements for different cycle link facilities

	Footway	Cycle Facility	Buffer	Traffic Lane [6]	Half Width[7]	Full Width[7]
CYCLE TRACK (1-way)						
Target	**>2.0m**	**2.5m**	**>0.5m**	**3.5m**	**>8.5m**	**>17m**
Desirable min	2.0m [1]	2.0m [3]	0.5m [5]	3.25m	7.75m	15.5m
Absolute min	1.8m [2]	1.5m [4]	0.3m	3.0m	6.6m	13.2m
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 [5]	3.25m	8.75m	14.0m
Absolute min	1.8m [2]	2.0m	0.3m	3.0m	7.1m	11.9m
HYBRID (TERRACED) CYCLE TRACK						
Target	**>2.0m**	**2.5m**	**n/a**	**3.5m**	**>8.0m**	**>16.0m**
Desirable min	2.0m [1]	2.0m [3]	n/a	3.25m	7.25m	14.5m
Absolute min	1.8m [2]	1.5m [4]	n/a	3.0m	6.3m	12.6m
MANDATORY OR ADVISORY CYCLE LANE						
Target	**>2.0m**	**2.0m [3]**	**n/a**	**3.5m**	**>7.5m**	**>15.0m**
Desirable min	2.0m [1]	1.75m	n/a	3.25m	7.0m	14.0m
Absolute min	1.8m [2]	1.5m [4]	n/a	3.0m	6.3m	12.6m
'LIGHT' SEGREGATION						
Target	**>2.0m**	**>2.0m**	**0.7m [5]**	**3.5m**	**>8.2m**	**>16.4m**
Desirable min	2.0m [1]	2.0m [3]	0.5m [5]	3.25m	7.95m	15.9m
Absolute min	1.8m [2]	1.5m [4]	0.3m	3.0m	6.6m	13.2m
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		0.5m	3.0m	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]		0.5m	3.0m	5.5m	11.0m

Notes:

1. Footway width provision should reflect pedestrian flow. In accordance with DMRB, 2.0m is considered a desirable minimum in most instances in order to allow two wheelchairs or double buggies to pass.
2. Localised narrowing of footway to 1.8m due to street furniture, but only over short distances (<100m).
3. In accordance with best practice, it is recommended that cycle tracks and lanes are a minimum of 2.0m in width in order to provide the potential for overtaking within the confines of the cycle track / lane. This dimension comprises 250mm clearance from the inside kerb; 1250mm effective width; and 500mm clearance to the kerb face of the separator between the cycle track and general traffic (or 550-575mm clearance to the outside edge of an Advisory or Mandatory cycle lane marking).
4. Absolute minimum width of 1.5m does not generally provide sufficient effective width for cyclists to overtake or to cycle side-by-side within the confines of the cycle track or cycle lane.
5. Where space is limited, it is recommended that the cycle lane / track width is maximised and the buffer zone width is minimised.
6. See Table 7 for minimum general traffic lane widths.
7. 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	>17.0m
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 Lane	Desirable min	7.0m	14.0m
Cycle Track (1-Way)	Absolute min	6.6m	13.2m
Shared Footway/Cycleway (Unsegregated)	Target	>6.5m	>13.0m
Hybrid Terraced Cycle Track	Absolute min	6.3m	12.6m
Cycle Lane	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	7.1m	11.9m
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 Recommended General Traffic Lane Widths

Speed (mph)	HGV % or 2-way HGV flow per hr	2-way vehicle flow per hr	Minimum Recommended General Traffic Lane Width (m)
20	n/a	<150	2.75 [1]
		n/a	3.00 [2]
30	<8% or <60	<1,000	3.00 [2]
	>8% or >60	<1,000	3.25
	<8% or <60	>1,000	3.25
	>8% or >60	>1,000	3.25
>30	-	-	3.25

Notes:

1 On 2-way roads with carriageway width <5.5m and with low flows, omit centre line marking

2 3.0m considered an acceptable minimum for bus routes

2.5.1 Providing for all types of Cyclist & DDA Compliance

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. Furthermore, the Disability Discrimination Act 1995 and the Equalities Act 2010 requires Highway Authorities to make reasonable adjustments to overcome physical barriers to access by removing or altering the barrier, enabling people to avoid it or providing access by an alternative means.

DDA responsibilities impact on design for cycling in the following ways:

- Removing, altering or avoiding physical barriers to access by bicycle (or providing alternatives). This includes providing sufficiently wide, smooth surfaced cycling infrastructure, with access provided through dropped kerbs and level transitions such that cycling infrastructure can also benefit wheelchair users. Consideration should also be given to the potential for, and implications of, facilities being shared between cyclists and wheelchair users.
- Making reasonable provision for cycles that have been built or adapted for use by individuals with a disability or cycles with trailers (or similar). This includes, for example, ensuring cycle gaps allow comfortable passage of tandems, tricycles and recumbent bicycles, and similarly for manual/electric wheelchairs and mobility scooters. It is noted that 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 in accordance with the Road Traffic Act 1999 (Section 185(1)).
- The necessary steps must be taken to ensure that provision for cyclists does not create new hazards and that new cycle (and pedestrian) facilities are intuitive for pedestrians, in particular those most vulnerable such as elderly, blind or partially sighted people and children.

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.

In accordance with best practice, a 2.0m minimum width is recommended for a one-way cycle track in order to provide appropriate clearance from the binding kerb edges and to provide sufficient effective width to allow overtaking within the confines of the cycle track.

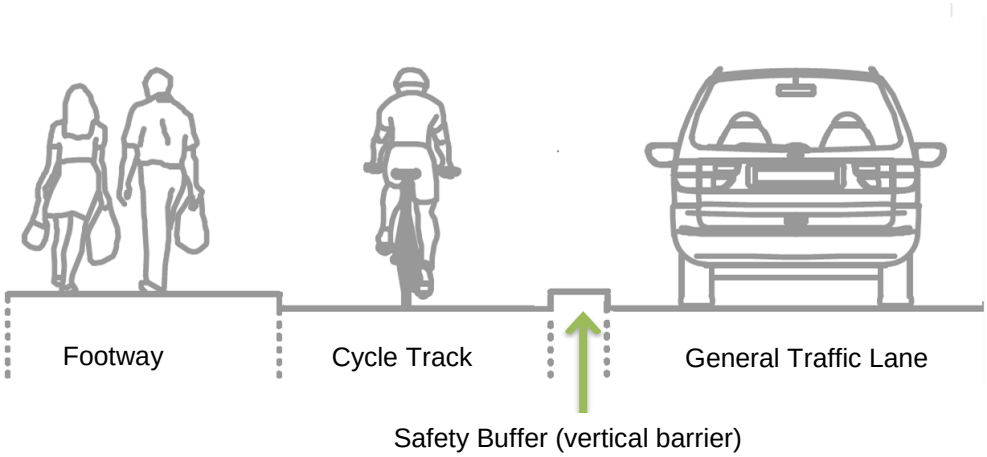
Two-way cycle tracks may be considered appropriate at certain locations. It is less expensive to construct a two-way cycle track on one side of the road than a one-way track on each side, and they may reduce the need for cyclists to cross busy roads in circumstances where trip generators such as schools, 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 **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



In space constrained environments, designers are encouraged to maximise the width of the cycle track by minimising the width of the safety buffer / separator to a recommended absolute minimum width of 0.3m.

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-01 One-way Cycle Track
- L-CT-GE-02 Two-way Cycle Track
- L-CT-GE-03 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, 2005

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, both of the above summary sheets show a narrow strip of colour surfacing underneath the line marking (see Section 5.3 for further details). 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 1.5m. This minimum width dimension should only be used where the speed limit is 30mph or less and over short distances (less than 100m) where carriageway width is constrained and with the condition that gradient is <7%.
- 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 Light Segregation

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' between the cycle lane and general traffic lane in order to provide separation. This buffer can take the form of hatch or chevron line markings and/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 can take many forms in various combinations and it is at the discretion of each Highway Authority, subject to the proposed arrangement conforming with approved road markings. It is also important to recognise that adopting a light segregation approach requires the implementing Highway 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 physical splitter island in order to direct motor vehicles away from the line of light segregation features. 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.

In accordance with recommended cycle track dimensions, it is also recommended that cycle lanes with light segregation are a minimum width of 2.0m in order to provide appropriate clearance from the binding edges and to provide sufficient effective width to allow overtaking within the confines of the cycle lane.

A trial implementation of the ‘armadillo’ form of light segregation is currently (March 2014) on going in Salford as part of the CCAG programme in Greater Manchester with the effectiveness to be carefully monitored. An image of the recently installed infrastructure is provided as **Figure 5** below.

Figure 5: ‘Armadillo’ Form of Light Segregation in Salford

Source: Salford Council

Summary sheets L-CL-GE-03 and L-CL-GE-04 in **Appendix E** provide information relating to potential forms of light segregation to reinforce the meaning of Mandatory cycle lanes by the use of intermittent physical features (such as Armadillos) on the inside of the Mandatory cycle lane marking making it unambiguous to drivers that this is a lane they must not enter. The arrangements shown include a 0.3m and 0.45m width segregation whereby the Mandatory cycle lane is reinforced with a physical feature, together with an alternative 0.7m buffer zone which seeks to make best use of road markings to provide a separation between cyclists and general traffic.

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

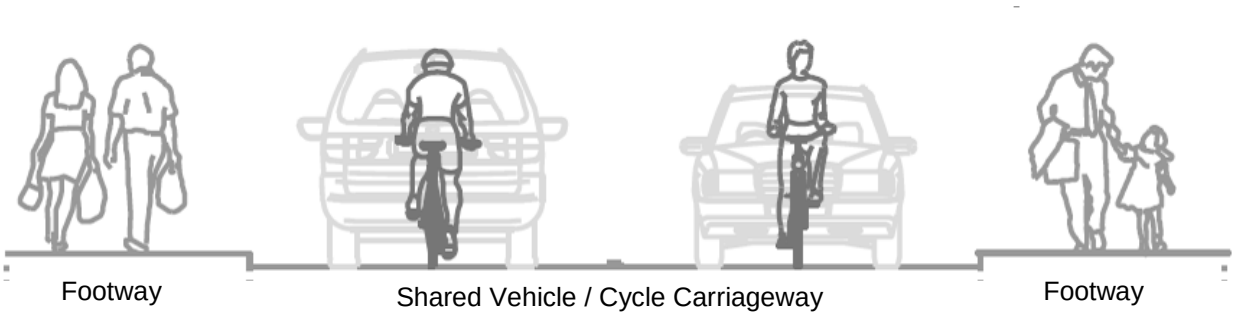
Summary sheets L-CL-CF-01 and L-CL-CF-02 in **Appendix E** provides information relating to contra-flow cycle lanes. Following amendments to the Traffic Signs Regulation and General Directions in 2011, new signing relating to contra-flow cycling without segregation and 'No Entry Except Cycles' became 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-01 in **Appendix E**, with a typical cross-section provided below as **Figure 6**.

Figure 6: Cross-Section of a Quiet Street

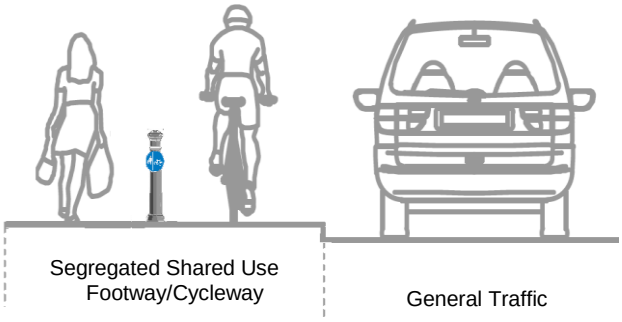


Quiet Streets are a potential option in environments (typically residential) where vehicular flows are low and where there is a 20mph limit.

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-01 (segregated) and L-SF-GE-02 (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 GMCDG 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-01 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 and where the intention is for the cyclist to take the prominent position within the Bus & Cycle Lane, a lane width of 3.3m is recommended. This removes the dilemma for bus drivers of whether there is sufficient width to overtake a cyclist within the confines of the bus lane whilst also reducing the likelihood of surface rutting / 'tracking' problems created by buses operating within a 3.0m to <3.3m bus lane width range. With a 3.3m 'shared use' Bus & Cycle lane, cycles are allowed to use the Bus Lane, but buses will have to drive into the general traffic lane when overtaking.
- Bus lane widths of between 3.3m and 3.9m should not be provided as they leave insufficient room for buses to overtake cyclists without the cyclist being 'squeezed', or for 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 sheets L-CT-BS-01 to L-CT-BS-04 and L-CL-BS-01 / L-CL-BS-02 in **Appendix E** show four potential bus stop options. Options 1A-1C show variations on the 'island' bus stop theme whereby the cycle track is diverted behind the bus stop area, with a pedestrian crossing raised table area provided at pedestrian crossing points in order to slow cyclists.

Option 2 shows a bus border buildout together with a shared footway/cycleway (which could be either segregated or unsegregated, depending on pedestrian and cycle flows) routed behind the bus stop. Options 1 and 2 are potential solutions for a cycle track through higher use bus stop (>12 buses per hour per directon) where it is preferable to keep cyclists separate from buses and general traffic.

Option 3 (L-CL-BS-01) illustrates an 'in line' cycle lane which terminates and recommences either side of the bus stop cage. This arrangement is generally considered to be an option only in locations where there are lower bus flows (<12 buses per hour per direction) such that there is a reduced likelihood of cyclists being required to negotiate a stopped bus. Where cyclists are required to negotiate a stopped bus and mix with general traffic, the on-carriageway cycle logos (Diag 1057) are intended to raise general traffic awareness of the potential presence of cyclists in the bus stop passing zone.

Option 4 (L-CL-BS-02) 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
- Provide an advisory cycle lane on the inside of 'floating' parking bays
- Provide 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 (1.0m clearance preferred).

Summary Sheets L-CL-PK-01 and L-CL-PK-02 in **Appendix E** provide further information on arrangements for running the cycle lane on the inside of parking bays such that the parking bays act as a buffer between the cyclists and general traffic (preferred) and, alternatively, of marking advisory cycle lanes on the outside of the marked parking bays.

In the case of cycle lane provision on the outside of marked parking bays and 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 or 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. Extracts of related guidance regarding general geometric standards at junctions are provided in **Appendix B**.

It is envisaged that guidance relating to junctions and crossings will be extended as the GMCDG 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 conspicuousness of cyclists and enabling them to take up a dominant position in the road whilst traversing the junction. Where possible and subject to the volume of conflicting side road general traffic, priority for cyclists across the mouth of the side road junction should be maintained through the provision of a raised table and appropriate give way markings to general traffic.

Where appropriate and feasible, priorities at cross-roads should also 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 conspicuousness and to enable them to adopt a dominant position in the road whilst traversing the junction
- 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. At locations with significant cycle flows, it may be desirable it increase the depth of the ASL to 7.0m, subject to DfT authorisation
- In some circumstances, part width ASL reservoirs not covering the full width of all approach lanes and with staggered stop lines may be appropriate, again subject to DfT authorisation
- 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 CCAG schemes in Greater Manchester do not route cyclists via roundabouts (with one exception which makes use of an adjacent Toucan crossing) and, as such, this version of the GMCDG 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 GMCDG 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. A minimum width of 4m between kerb faces is recommended 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.

Subject to DfT approval in principle, it is intended that future versions of the GMCDG will include a proposed detail of a Zebra crossing with parallel cycle crossing.

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 GMCDG.

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 users, in particular mobility impaired users of the footway, 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.

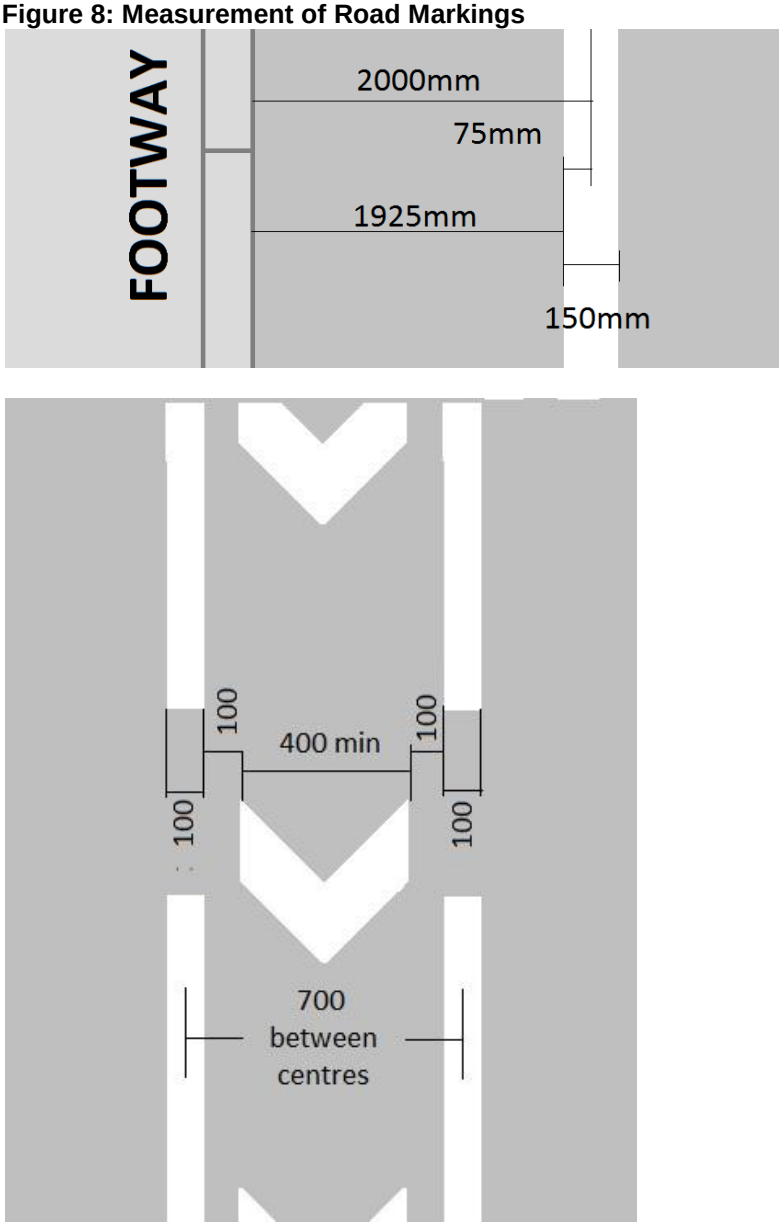
Table 10: Road Markings associated with Cycle Facilities

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. Therefore, 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 the GMCDG 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**.

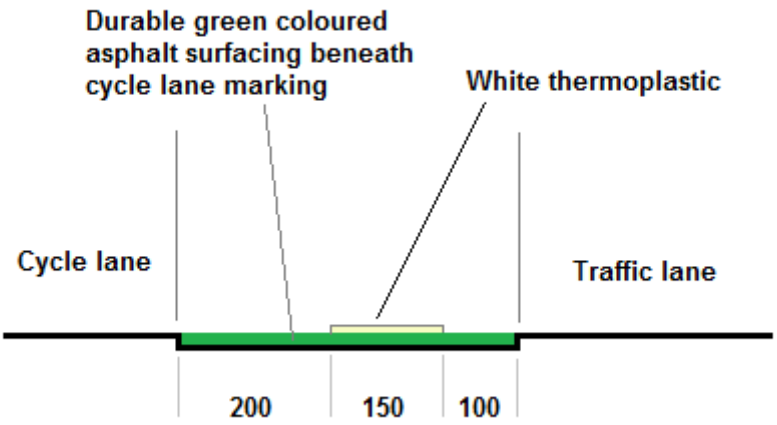
5.3 Coloured Surfacing

It has been suggested in independent research that approximately 60% of drivers are more likely to ignore non-coloured facilities. However, blanket application of full coloured surfacing 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). The use of coloured surfacing is therefore recommended in the following circumstances:

- At the beginning and end of cycle lanes
- 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: Durable green coloured asphalt surfacing 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** depict the proposed approach of a linear strip of durable green coloured asphalt 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.

To promote consistency across the city region, the use of green as a common colour for cycle facilities is recommended across all Districts. Although initially more expensive, the targeted use of durable green coloured asphalt to emphasise cycle facilities is considered to offer ‘whole life’ value than the alternative screed overlay due to the reduced maintenance requirements and increased longevity.

It is also recommended that opportunities are sought to work with highway maintenance departments to coordinate the cycle lane marking and coloured surfacing works with the wider resurfacing programme in order to maximise the effect / provide a high quality ‘kerb-to-kerb’ finish and to reduce the potential for future resurfacing works impacting on the cycle scheme legibility.

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) 300mm

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. As referred to in Section 2.7.2 regarding light segregation, protection to cycle lanes can be provided by the following methods:

- Hatched or chevron road markings outside the cycle lane
- Intermittent traffic islands (which should not reduce the cycle lane width)
- 'Bolt on' physical features such as armadillos (or similar), recognising that such 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

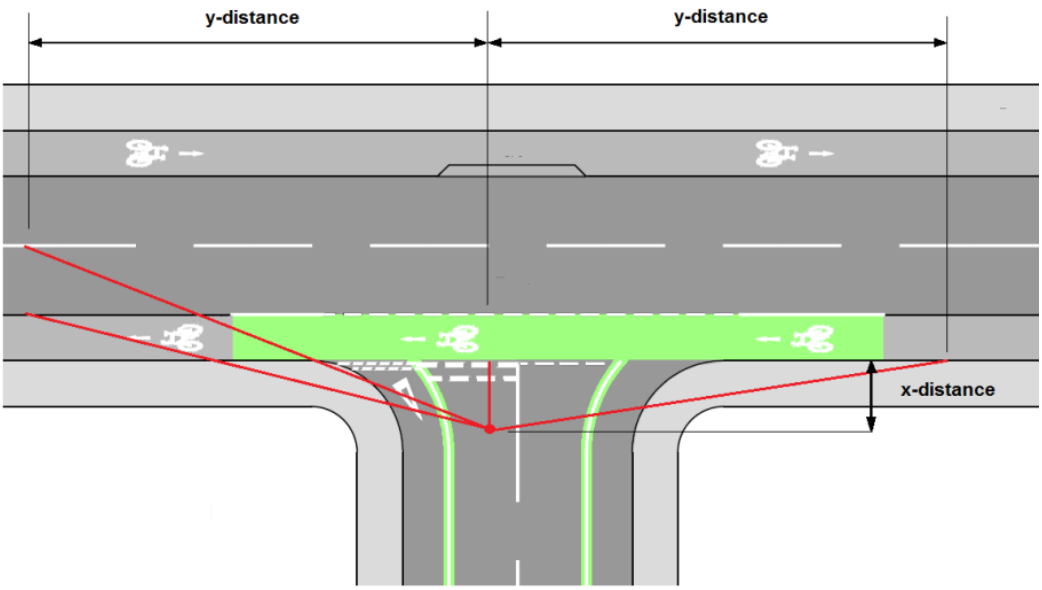
- London Cycling Design Standards, Transport for London, 2005
- Cycling by Design, Transport Scotland, 2011
- Irish National Cycle Manual, National Transport Authority, 2011
- Design Manual for Bicycle Traffic, CROW, 2007
- Design Checklist and Guidance, Cycling England, 2009
- Guidelines and Practical 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
- Barclays Cycle Superhighways Infrastructure Design Guidance, 2011

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*

B4 Bridges

Table B2 below is an extract from BD 29/04 of DMRB and summarises the minimum width of a footway (or footpath) and a cycle track on a bridge.

Table B2: Minimum Width of a Footway (or Footpath) and Cycle Track on a Bridge

	Pedestrian Path	Cycle Path	Total Width
When segregated by kerb not less than 50mm high	1.75m	1.75m	3.5m
When segregated by railings not less than 900mm high	1.95m	1.95m	3.9m
When segregated by a white line, colour contrast or surface texture	1.5m	1.5m	3.0m
Unsegregated	-	-	2.0m

As set out in Section 4.23 of TD 19/06, the minimum height for vehicle parapets is 1.4m where a cycleway runs adjacent to vehicles.

4.23 The height of vehicle parapets must be measured above the adjoining paved surface and must not be less than the following:

1000 mm	–	For vehicle parapets except as below
1250 mm	–	For all bridges and structures over railways carrying motorways, or roads to motorway standards, from which pedestrians, animals, cycles and vehicles drawn by animals are excluded by order
1500 mm	–	For all other bridges and structures over railways, except as below
1400 mm	–	For cycleways immediately adjacent to the vehicle parapet
1500 mm	–	For accommodation bridges
1500 mm	–	For very high containment level applications
1800 mm	–	For bridleways or equestrian usage immediately adjacent to the vehicle parapet
1800 mm	–	For automated railways and where there is a known vandalism problem over railways

Appendix C: Construction Cost Estimates Look-up Table

Table C1 - Construction Cost Estimates Look-up Table

Sheet No.	Data Sheet Reference	Data Sheet title	Extent of assumed c'way width alterations [1]	Extent of assumed f'way width alterations [1]	Work Zone Length	Typical cost HIGH (full civil works) [2]	Typical cost LOW (limited civil works) [3]
1	L-CT-GE-01	One Way Cycle Track	+1.0m	n/a	1,000m	£960k – £1.3m [4]	£420k – £580k [4]
2	L-CT-GE-02	Two Way Cycle Track	+0.5m	n/a	1,000m	£880k – £1.2m [5]	£300k – £400k [5]
3	L-CT-GE-03	Hybrid Terrace Cycle Track	+1.0m	+1.0m	1,000m	£1.5m – £1.9m [4]	£500k – £700k [4]
4	L-CL-GE-01	Mandatory Cycle Lane	+1.0m	n/a	1,000m	£190k – £265k [4]	£70k – £90k [4]
5	L-CL-GE-02	Advisory Cycle Lane	+1.0m	n/a	1,000m	£190k – £265k [4]	£70k – £90k [4]
6	L-CL-GE-03	Light Segregation Option 1 (0.45-0.7m)	+1.0m	n/a	1,000m	£750k – £1.0m [4]	£160k – £220k [4]
7	L-CL-GE-04	Light Segregation Option 2 (0.3m)	+1.0m	n/a	1,000m	£750k – £1.0m [4]	£160k – £220k [4]
8	L-SF-GE-01	Shared Foot/Cycleway – Segregated	n/a	+2.0m	1,000m	£900k – £1.2m [4]	£190k – £250k [4]
9	L-SF-GE-02	Shared Foot/Cycleway – Unsegregated	n/a	+1.0m	1,000m	£500k – £690k [4]	£105k – £150k [4]
10	L-QS-GE-01	Quiet Street	-1.0m	n/a	1,000m	£500k – £680k [4]	£100k – £150k
11	L-CL-CF-01	Mandatory Contraflow Cycle Lane	n/a	n/a	1,000m	£90k – £100k	£80k – £90k
12	L-CL-CF-02	Mandatory Contraflow Cycle Lane (without entry island)	n/a	n/a	1,000m	£90k – £100k	£80k – £90k
13	L-CL-BL-01	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
14	L-CL-PK-01	Cycle Lane at Parking Bays : Option 1 – 'Floating' Parking Bays	+1.0m	n/a	75m	£75k – £105k [5]	£15k – £20k [5]
15	L-CL-PK-02	Cycle Lane at Parking Bays : Option 2 – Cycle Lane 'Bend Out'	+1.0m	n/a	75m	£60k – £80k [5]	£15k – £20k [5]
16	L-CT-BS-01A	Bus Stop Option 1A – 'Island' Bus Stop with Bend In Cycle Track	n/a	+2.5m	75m	£150k – £200k [5]	£50k – £75k [5]
17	L-CT-BS-01B	Bus Stop Option 1B – 'Island' Bus Stop with In line Cycle Track	n/a	+2.5m	75m	£150k – £200k [5]	£50k – £75k [5]
18	L-CT-BS-01C	Bus Stop Option 1C – 'Island' Bus Stop with Cycle Track to Back of Footway	n/a	+2.0m	75m	£125k – £200k [5] (Subject to local site conditions)	£50k – £75k [5]
19	L-CT-BS-02	Bus Stop Option 2 – Bus Border with Shared Use Footway / Cycleway	+1.5m	+2.0m	75m	£115k – £155k [5]	£40k – £50k [5]

Sheet No.	Data Sheet Reference	Data Sheet title	Extent of assumed c'way width alterations [1]	Extent of assumed f'way width alterations [1]	Work Zone Length	Typical cost HIGH (full civil works) [2]	Typical cost LOW (limited civil works) [3]
20	L-CL-BS-01	Bus Stop Option 3 – 'In Line' Cycle Lne	+2.0m	n/a	75m	£75k –£100k[5]	£20k – £25k [5]
21	L-CL-BS-02	Bus Stop Option 4 - Cycle Lane at Bus Stop within Bus Lane	+1.5m	n/a	75m	£55k – £75k [5]	£15k – £20k [5]
22	J-CT-GE-01	One Way Cycle Tracks at a side road	+1.0m	n/a	50m	£60k – £80k [4]	£20k – £30k [4]
23	J-CT-GE-02	One Way Cycle Tracks at a side road – Raised junction	+1.0m	n/a	50m	£50k – £65k [5]	£20k – £25k [5]
24	J-CT-GE-03	One Way Cycle Tracks at a side road – Raised junction with 5.0m setback	+0.5m	n/a	50m	£60k – £80k [5]	£30k – £40k [5]
25	J-CT-GE-04	Two Way Cycle Track at a side road	+0.5m	n/a	50m	£50k – £65k [5]	£20k – £25k [5]
26	J-CT-GE-05	Two Way Cycle Track at a side road 5.0m Set back	+0.5m	n/a	50m	£60k – £80k [5]	£30k – £40k [5]
27	J-CL-GE-01	Mandatory Cycle Lane at a side road	+1.0m	n/a	50m	£35k – £50k [4]	£10k – £15k [4]
28	J-CL-GE-02	Advisory Cycle lane at a side road	+1.0m	n/a	50m	£35k – £50k [4]	£10k – £15k [4]
29	J-CL-GE-03	Cycle Lane through signal controlled jct	+0.5m	n/a	250m	£140k – £190k [4]	£70k – 100k [4]
30	C-CL-GE-01	Cycle Lane at a Toucan Crossing	+0.5m	+1.0m	50m	£90k – £120k [4] Inc. crossing; £60k – £85k exc. crossing	£60k – £80k [4] Inc. crossing; £30k – £45k exc. crossing
31	C-CP-GE-01	Cycle Crossing at a major road	n/a	n/a	100m	£6k – £8k	n/a
32	C-CP-GE-02	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 Guidance

D1 Overview

The application of different cycle parking facilities is at the discretion of the designer and the local site and budgetary constraints. 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.

This document has been produced to offer advice on cycle parking primarily at workplaces, heavy rail stations, Metrolink stops, and schools. However, the basic principles contained within can be applicable elsewhere, for example at shopping centres. It is the intention that this section on cycle parking will be extended and updated as required through future iterations of the GMCDG.

D2 Principles of Good Cycle Parking Provision

The following table summarises the main points to consider for those planning cycle parking:

Visible	Parking facilities should be well signed, easy to find and benefit from good natural surveillance. Good siting and high quality facilities will help demonstrate the importance of cycling as a transport mode.
Accessible	Parking should be located as close as possible to the final destination (generally within 30m). It should be easy to get to, involving no detours, and should be well laid out with no difficult ramps or awkward stands to deal with.
Safe and Secure	It should give cyclists the confidence that their bike will still be there when they return. Adequate provision should be made for the bicycle to be secured with its owner's lock unless other security arrangements make this unnecessary. The facility should help users feel personally secure - those that make users feel at risk will not be used.
Consistently available	In places such as shopping areas, small clusters of stands at frequent intervals are usually better than larger concentrations at fewer sites.
Covered	The level of protection from the weather should be appropriate for the length of stay. Poor protection at long-term parking places will deter cycle use.
Easy to use	Parking facilities should be easy to use by all members of the community, accept all types of bicycle, and adequately support the frame. Cycle racks that require a bicycle to be lifted are often ignored in favour of locations requiring less effort, such as railings or street furniture. Bikes parked too close together can cause cables and handlebars to snag. Where provided, locking mechanisms should not be difficult to operate and instructions should be easily understood.
Fit for purpose	Racks and other support systems which only grip the front wheel should not be used since they provide poor stability and do not allow the frame to be secured. Also, if one bike falls it can damage not only itself but those next to it. Cycle parking should not be sited where it will get in the way of pedestrians, especially those whose vision is impaired. Abandoned bicycles should be promptly removed

Well managed and well maintained	Charges should be set at a level that will encourage use. Coin-operated locks should be properly maintained and not attract thieves. The process of paying charges for renting lockers etc. should be as simple as possible. Automated systems or electronic smart card operation should not create delays at peak periods.
Attractive	The design of cycle parking facilities should be sensitive to the surrounding area. It should also be attractive in the sense that users do not feel personally at risk because it has been placed out of sight of passers-by.
Coherent	It should relate well to other cycle infrastructure. There should be no road safety hazards, such as dangerous junctions or severance by busy roads likely to create a barrier to its use. Where possible, signed identified routes leading directly to the cycle parking should be provided.
Linked to other needs of cyclists	Where provided at public transport interchanges or in city centres as cycle centres, opportunities to combine with cycle hire, repair and tourism activities should be exploited.

Adapted from Cycle England Design Portfolio, 2009

D3 Level of Provision

For the purposes of this guidance cycle parking has been grouped into three categories:

Level of provision	Example	Typical application
Uncovered	Simple Sheffield Stand or locking rail	Visitor parking
Covered (semi-enclosed)	Covered Sheffield stands with no access controls	Minimum basic provision for workplaces
Covered (fully enclosed)	Covered Sheffield stands in a compound with access controls; district Cycle Hub	Interchanges, residential parking

Tables D1 – D3 on the following pages provide an overview of the different options / types of cycle parking facility under each of the three levels of provision categories set out above. As a rough guide, at heavy rail stations and Metrolink stops the level of provision should be informed by the total numbers of boarders and alighters in accordance with the look-up table provided as **Table D4** and commentary below.

D4 Number of Cycle Parking Spaces

For heavy rail stations, cycle parking for 5% of boarders and alighters should be provided. Metrolink stops serve smaller catchment areas partly due to the closer spacing of the stops and therefore cycle parking should be provided for 2% of all boarders and alighters. A 10% cycle mode share is the aspiration of Velocity 2025, therefore provision for 5% of passengers should be seen as the first stage in a phased approach. It is therefore necessary to consider and plan for future expansion of any cycle parking facilities to be installed.

At workplaces parking should be provided for 5% of employees, and at schools for 5% of pupils and staff. A survey should precede and inform the installation of cycle parking at workplaces, schools or for residents.

Conditions may vary and for many reasons there may be differences in the propensity to cycle in a locality therefore planners should exercise some discretion when calculating the number of cycle parking places.

Key for Tables D1 to D3

'Best used for' Key:

	Suitable
	Not suitable

'Features' Key:

Criteria	High (H)	Medium (M)	Low (L)
Natural survelliance	High visibility of contents	Partially restircted view of contents	No visibility of contents
CCTV	Integral as part of cycle parking facility	Covered by existing CCTV (eg station car park)	No CCTV. Extra cost to provide
Access Control	Smart card	Any form of locking security	No access control
Weather protection	Fully protected from weather	Partially protected from weather	Not protected from weather
Registration requirement	Turn up & use (open access)	Coin operated/pay at point of use	Smart card / pre-registration/ membership requirement
Ease of use	Easy to use and to lock/unlock cycle. No lifting of bike required	User required to negotiate access arrangements and/or to lift cycle.	Not easy to directly access cycle locking facility and/or user required to lift cycle.
Equipment Storage	Integral as part of cycle parking facility	No Kit Storage. Extra cost to provide	No kit storage and without realistic to provide
Lighting	Integral as part of cycle parking facility	Covered by existing local lighting (eg station car park, ambient light)	No street lighting. Extra cost to provide

Table D1 – Uncovered Cycle Parking Options

			Best used for					Features								
								Security			*Comfort & Convenience*					
Type of Facility	**Image**	**Suitability Commentary**	On-street / Open access	Off-street - Stations	Off-street - Schools	Off-street Workplaces	Off-street Residences	Natural surveillance	CCTV	Access control	Protected from weather	Ease of use - registration requirement	Ease of use - infrastructure	Kit storage	Lighting	**Deliverability**
Sheffield Stand		**Minimum recommended provision where limited cycle parking demand and for stort stay use**						H	L	L	L	H	H	L	L	Visually unobtrusive and minimal space required for low numbers of stands therefore permissions straightforward. Simple to install on existing hardstanding; root fixed or buried.
Cycle Pod		Potential alternative to Sheffield Stand where need for **increased security**						H	L	L	L	H	H	L	L	Visually more obtrusive than Sheffield Stands. Minimal space required for low numbers of stands. Simple to install on existing hardstanding.
Wall Hoops / Locking Rail		Potential alternative to Sheffield Stand where **space is constrained**						H	L	L	L	H	M	L	L	Visually unobtrusive. Simple four-bolt fixing. Permission needed from wall owner to install.

Table D2 – Covered (semi-enclosed) Cycle Parking Options

			Best used for					Features								
								Security			*Comfort & Convenience*					
Type of Facility	**Image**	**Suitability Commentary**	On-street / Open access	Off-street - Stations	Off-street - Schools	Off-street Workplaces	Off-street Residences	Natural surveillance	CCTV	Access control	Protected from weather	Ease of use - registration requirement	Ease of use - infrastructure	Kit storage	Lighting	**Deliverability**
Sheffield Stand		**Minimum recommended provision at key destinations and medium to long term parking locations**						H	L	L	H	H	H	L	L	Visually more obtrusive than stands alone; planning consent may be required. Simple installation to existing hard-standing, ideally concrete.
Cycle (Street) Pod		Potential alternative to Sheffield Stand where need for **increased security**						H	L	L	H	H	H	L	L	Visually more obtrusive than stands alone; planning consent may be required. Simple installation to existing hard-standing, ideally concrete.
Semi-vertical		Potential alternative to Sheffield Stand where **space is constrained** or where there is a need for increased parking capacity						H	L	L	H	H	L	L	L	Visually more obtrusive than stands alone; planning consent may be required. Simple installation to existing hard-standing, ideally concrete.
Two-tier racking		Potential alternative to Sheffield Stand where **space is constrained** or where there is a need for increased parking capacity						M	L	L	H	H	M	L	L	Visually more obtrusive than stands alone; planning consent may be required. However, more bikes per unit area of space than other forms of storage. Simple installation to existing hard-standing, ideally concrete.

Table D3 – Fully Enclosed Cycle Parking Options

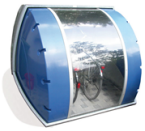
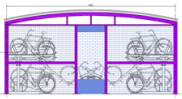
			Best used for					Features								
								Security			*Comfort & Convenience*					
Type of Facility	**Image**	**Suitability Commentary**	On-street / Open access	Off-street - Stations	Off-street - Schools	Off-street Workplaces	Off-street Residences	Natural surveillance	CCTV	Access control	Protected from weather	Ease of use - registration requirement	Ease of use - infrastructure	Kit storage	Lighting	**Deliverability**
Proprietary Shelter (Roof and walls but no lockable door)		Potentially suitable at locations where there is a need for **increased weather protection;** where there is not a requirement for **improved security;** or where **budgetary constraints.** Could be upgraded with an access control system at a later date if required. Targeted at medium to long term usage.						H	L	L	H	H	H	L	L	Visually more obtrusive and more space required than covered stands. Planning consent may be required. Simple to install on existing hardstanding.
Lockers (horizontal)		Offers increased security for cycle (and kit) compared to a Sheffield Stand, although not to same level of security as a hub. Some products do not offer the opportunity to lock the cycle to a solid structure within the locker. Requires management.						L	L	M	H	M	M	H	L	Little more space required per bike than Sheffield Stand. Simply installed by bolting to existing hard standing. Colour may be an issue in some locations. Management of lockers may be required under the agreement to install.
Lockers (vertical)		Offers increased security for cycle (and kit) compared to a Sheffield Stand, although not same level of security as a hub. Requires management. Vertical lockers offer reduced space requirements compared to conventional horizontal lockers.						L	L	M	H	M	L	H	L	Less space required per bike than Sheffield Stand. Simply installed by bolting to existing hard standing. Colour may be an issue in some locations. Management of lockers may be required under the agreement to install.
Proprietary Shelter		**Lower unit cost** per cycle space than other secure enclosed options. **Two levels of security** as offers the opportunity to lock the cycle to a solid structures within the shelter in addition to the access control system.						H	L	M	H	L	H	H	L	May require planning consent. More substantial hard standing may also be required than simple canopy. Data and power supply required if lighting, CCTV and door access systems are installed.
Breadbins		Variant to lockers. Benefits compared to lockers include easier access; more space efficient; offers increased security (as able to lock the cycle to a solid structure within the breadbin); lower maintenance requirements.						M	L	M	H	L	H	L	L	Little more space required per bike than sheffield stand. Simply installed by bolting to existing hard standing. Colour may be an issue in some locations. Management of lockers may be required under the agreement to install.
'Northern' Cycle Hub		Suitable at locations where there is demand for secure long stay cycle parking, but a lower demand than at District Hubs.						M	M	H	M	L	M	L	H	May require planning consent. Substantial hard standing required, therefore surveys of utilities etc will be necessary. Data and power supply required if lighting, CCTV and digital door access systems are installed.
District Hub		Suitable at locations where there is high demand for secure long stay cycle parking such as at major public transport interchanges. High profile cycle parking facility for high profile locations.						H	H	H	H	L	H	H	H	Will require planning consent. Substantial hard standing required, therefore surveys of utilities etc will be necessary. Data and power supply required for lighting, CCTV and digital door access systems. Large building footprint requires more space.

Table D4 – Look-up Table

Heavy Rail Stations & Metrolink Stops					
Boarders Per Day		**Guideline Number of Spaces @ Rail stations**	**Guideline Number of Spaces @ Metrolink stops**	**Minimum Recommended Provision**	**Notes**
Low	**250**	5% boarders & alighters per day*	2% boarders & alighters per day	**Covered Sheffield Stands**	Gross overprovision of facilities should be avoided. Further provision can be added as demand grows. Future growth should be planned for based on a minimum of 10% mode share as per Velocity 2025 vision. *Metrolink stations: spaces for 2% of boarders & alighters to reflect smaller catchment areas, variable subject to location.
Medium	**250-500**	5% boarders & alighters per day*	2% boarders & alighters per day	**Mix of Covered Sheffield Stands + Secure Enclosed**	
High	**>500**	5% boarders & alighters per day*	2% boarders & alighters per day	**Primarily Secure Enclosed**	

Other locations			
	Guideline Number of Spaces	**Minimum Recommended Provision**	**Notes**
Schools (staff & pupils)	5% of all staff/pupils	**Secure Enclosed**	It is recommended that survey work be undertaken before deciding on type/number/location of stands. Consult BUG if in existance. Gross over-provision of stands should be discouraged. Additional visitor parking should be considered.
Workplaces	5% of all workforce	**Covered Sheffield Stands**	It is recommended that survey work be undertaken before deciding on type/number/location of stands. Consult BUG if in existance. Gross over-provision of stands should be discouraged. Staff parking separate from pupil parking. Additional visitor parking should be considered.
Residential	determined by survey of residents	**Secure enclosed**	It is recommended that survey work be undertaken before deciding on type/number/location of stands.

Appendix E: Design Guidance and Standards Summary Sheets

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.

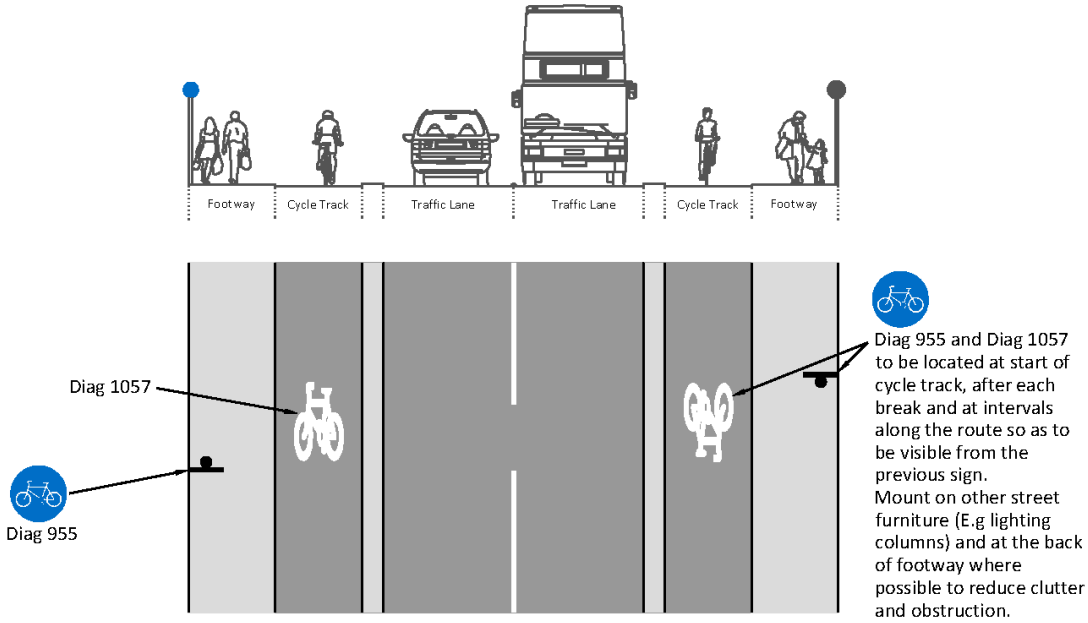
Table E1: Design Guidance and Standards Summary Sheets

Links	
L-CT-GE-01	One Way Cycle Tracks
L-CT-GE-02	Two Way Cycle Track
L-CT-GE-03	Hybrid Terrace Cycle Track
L-CL-GE-01	Mandatory Cycle Lane
L-CL-GE-02	Advisory Cycle Lane
L-CL-GE-03	'Light' Segregation Option 1 : 0.45m-0.725m Buffer Zone
L-CL-GE-04	'Light' Segregation Option 2 : 0.3m Buffer Zone
L-SF-GE-01	Shared Foot/Cycleway – Segregated
L-SF-GE-02	Shared Foot/Cycleway – Unsegregated
L-QS-GE-01	Quiet Street
L-CL-CF-01	Mandatory Contraflow Cycle Lane
L-CL-CF-02	Mandatory Contraflow Cycle Lane without entry island
L-CL-BL-01	Cycle Lane within a Bus Lane
L-CL-PK-01	Cycle Lane at Parking Bays : Option 1 – 'Floating' Parking Bays
L-CL-PK-02	Cycle Lane at Parking Bays : Option 2 – Cycle Lane 'Bend Out'
L-CT-BS-01A	Bus Stop Option 1A – 'Island' Bus Stop with Bend In Cycle Track
L-CT-BS-01B	Bus Stop Option 1B – 'Island' Bus Stop with In line Cycle Track
L-CT-BS-01C	Bus Stop Option 1C – 'Island' Bus Stop with Cycle Track to Back of Footway
L-CT-BS-02	Bus Stop Option 2 – Bus Border with Shared Use Footway / Cycleway
L-CL-BS-01	Bus Stop Option 3 – 'In Line' Cycle Lane
L-CL-BS-02	Bus Stop Option 4 - Cycle Lane at Bus Stop within Bus Lane
Junctions	
J-CT-GE-01	One Way Cycle Tracks at a side road
J-CT-GE-02	One Way Cycle Track at side road – Raised junction
J-CT-GE-03	One Way Cycle Track at side road – Raised junction with 5.0m setback
J-CT-GE-04	Two Way Cycle Track at side road – Raised junction
J-CT-GE-05	Two Way Cycle Track at side road – Raised junction with 5.0m setback
J-CL-GE-01	Mandatory Cycle Lane at a side road
J-CL-GE-02	Advisory Cycle Lane at a side road
J-CL-GE-03	Cycle Lane through signal controlled junction
Crossings	
C-CL-GE-01	Mandatory Cycle Lanes at a Toucan Crossing
C-CP-GE-01	Cycle Crossing at a major road
C-CP-GE-02	Cycle Crossing at a dual Carriageway

Transport for Greater Manchester

Title:

ONE-WAY CYCLE TRACKS (ON BOTH SIDES OF THE ROAD)



Target	>2.0m	2.5m	0.3m Mins	3.5m	3.5m	0.3m Mins	2.5m	>2.0m
Desirable Minimum	2.0m(1)	2.0m(3)		3.25m	3.25m		2.0m(3)	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(4)		3.0m(6)	3.0m(6)		1.5m(4)	1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m may be justified where not considered to compromise pedestrian and mobility impaired movement and/or where street furniture exists.
3. 2.0m cycle track width accommodates overtaking cyclists, hence 2.0m is the desirable minimum width (else risk of overtaking cyclist conflicting with segregation feature).
4. It is recommended that the absolute minimum cycle track width of 1.5m is only considered over short distances (<100m) and where the gradient is <7%.
5. Designers are encouraged to minimise the width of the segregation feature (separator) in order to maximise the width of the cycle track. 0.3m considered to be an acceptable minimum width.
6. See Table 7, Chapter 2 for minimum general traffic lane widths. 3.0m considered to be an acceptable minimum in most instances on links with a 30mph speed limit, including on bus routes.

Advantages:

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

Disadvantages:

- Cycle Track 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 / Commentary:

- 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
- Requires 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

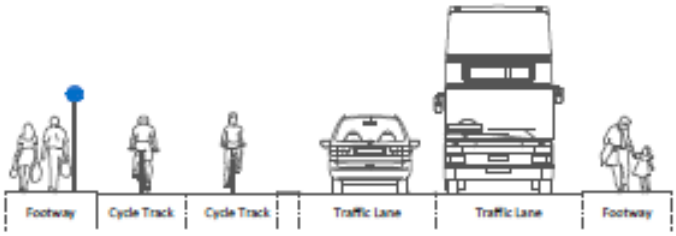
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on *both* sides of the carriageway.

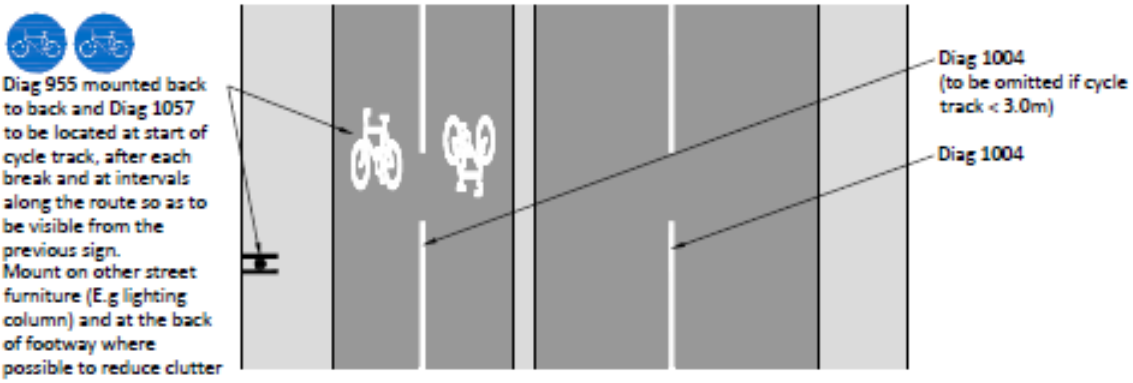
Drawing No:	L-CT-GE-01	Rev: A
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

TWO-WAY CYCLE TRACK (ON ONE SIDE OF THE CARRIAGEWAY)





Target	>2.0m	4.0m	0.3m Min(5)	3.5m	3.5m	>2.0m
Desirable Minimum	2.0m(1)	3.0m(3)		3.25m	3.25m	2.0m(1)
Absolute Minimum	1.8m(2)	2.0m(4)		3.0m(6)	3.0m(6)	1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m effective width may be justified where not considered to compromise pedestrian and mobility impaired movement and/or where street furniture exists.
3. 2.0m cycle track width accommodates overtaking cyclists, hence 2.0m is the desirable minimum width (else risk of overtaking cyclist conflicting with segregation feature).
4. It is recommended that the absolute minimum cycle track width of 2.0m is only considered over short distances (<100m) and where the gradient is <7%.
5. Designers are encouraged to minimise the width of the segregation feature (separator) in order to maximise the width of the cycle track. 0.3m considered to be an acceptable minimum width.
6. See Table 7, Chapter 2 for minimum general traffic lane widths. 3.0m considered to be an acceptable minimum in most instances on links with a 30mph speed limit, including on bus routes.

Advantages:

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

Disadvantages:

- Cycle Track has to revert to cycle lanes through junctions
- Requires careful design across side roads
- 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 / Commentary:

- 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
- Requires 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.
- Generally lower cost than one-way cycle tracks in both directions as reduced widening required.

Typical Costs:

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

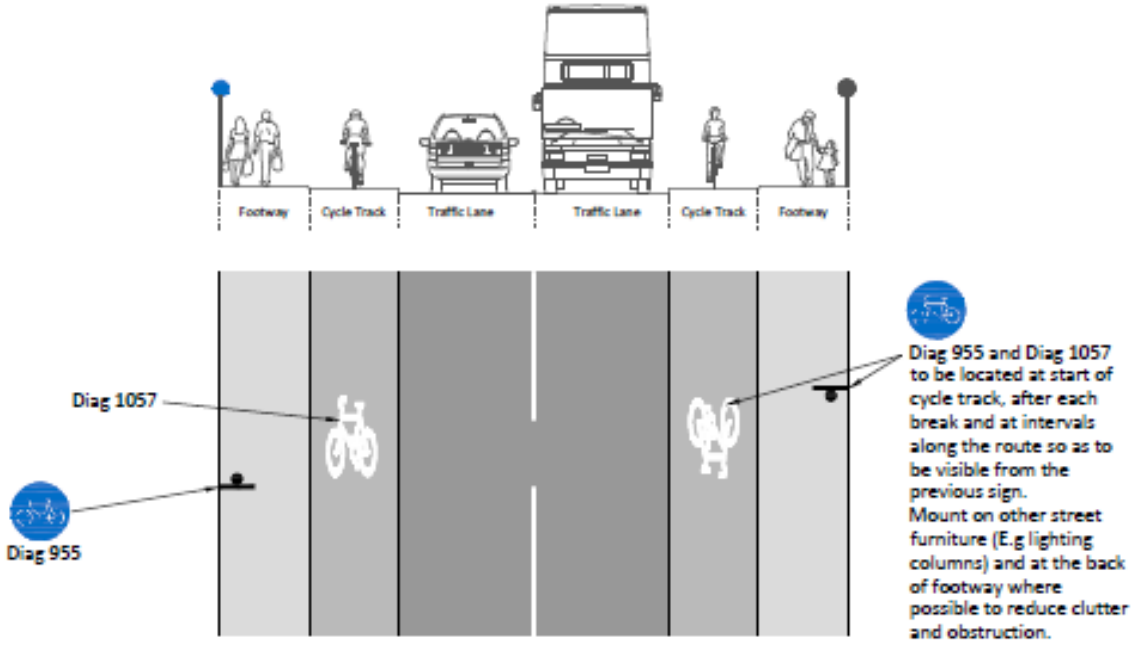
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume two-way cycle facility provision on one side of the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

Drawing No:	L-CT-GE-02	Rev: A
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)	3.25m	3.25m	2.0m(3)	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(4)	3.0m(5)	3.0m(5)	1.5m(4)	1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m may be justified where not considered to compromise pedestrian and mobility impaired movement and/or where street furniture exists.
3. 2.0m cycle track width accommodates overtaking cyclists, hence 2.0m is the desirable minimum width (else risk of overtaking cyclist required to leave raised (hybrid) cycle track and merge into general traffic lane with the associated conflict).
4. It is recommended that the absolute minimum cycle track width of 1.5m is only considered over short distances (<100m) and where the gradient is <7%.
5. See Table 7, Chapter 2 for minimum general traffic lane widths. 3.0m considered to be an acceptable minimum in most instances on links with a 30mph speed limit, including on bus routes.

Advantages:

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

Disadvantages:

- Cycle track 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 cyclists and general traffic

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
- Requires smooth, flat, well-drained and well-maintained surface
- Less appropriate 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	£500,000
Upper Cost Estimate	£1,900,000

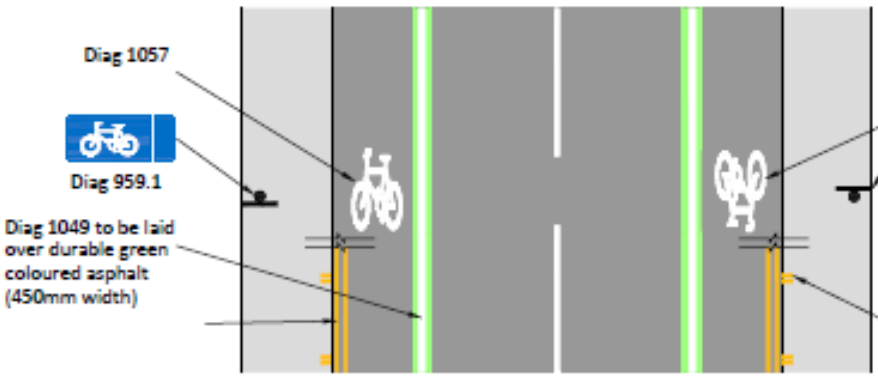
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

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

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANE



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. Mount on street furniture (E.g lighting column) and at the back of footway where possible to reduce clutter and obstruction.

Indication of waiting and loading restrictions by markings will enable civil enforcement, (but will still require TRO). May be time limited to protect cycle lane during specific periods (E.g School drop off / pick up)

Target	>2.0m	2.0m	3.5m	3.5m	2.0m	>2.0m
Desirable Minimum	2.0m	1.75m	3.25m	3.25m	1.75m	2.0m
Absolute Minimum	1.8m(1)	1.5m(2)	3.0m(3)	3.0m(3)	1.5m(2)	1.8m(1)

1. Localised narrowing of footway due to street furniture permitted - need to reflect pedestrian flows.
2. It is recommended that the absolute minimum cycle track width of 1.5m is only considered over short distances (<100m) and where the gradient is <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 cycle lane
- Drivers commit an offence if they enter the cycle lane
- Reduced width requirements compared to physical segregation options
- Easier continuation at junctions than physically segregated options
- Allows cyclists to freely enter and exit the cycle lane

Disadvantages:

- Provides no physical segregation between cyclists and general traffic
- Requires a TRO which can be a lengthy process and subject to objections
- Has to revert to Advisory cycle lane 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.
- Durable green coloured asphalt surfacing to be provided at the beginning and end of Mandatory cycle lane sections and adjacent to the longitudinal Diag 1049 road marking to raise conspicuousness of cycle lane.
- Requires 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

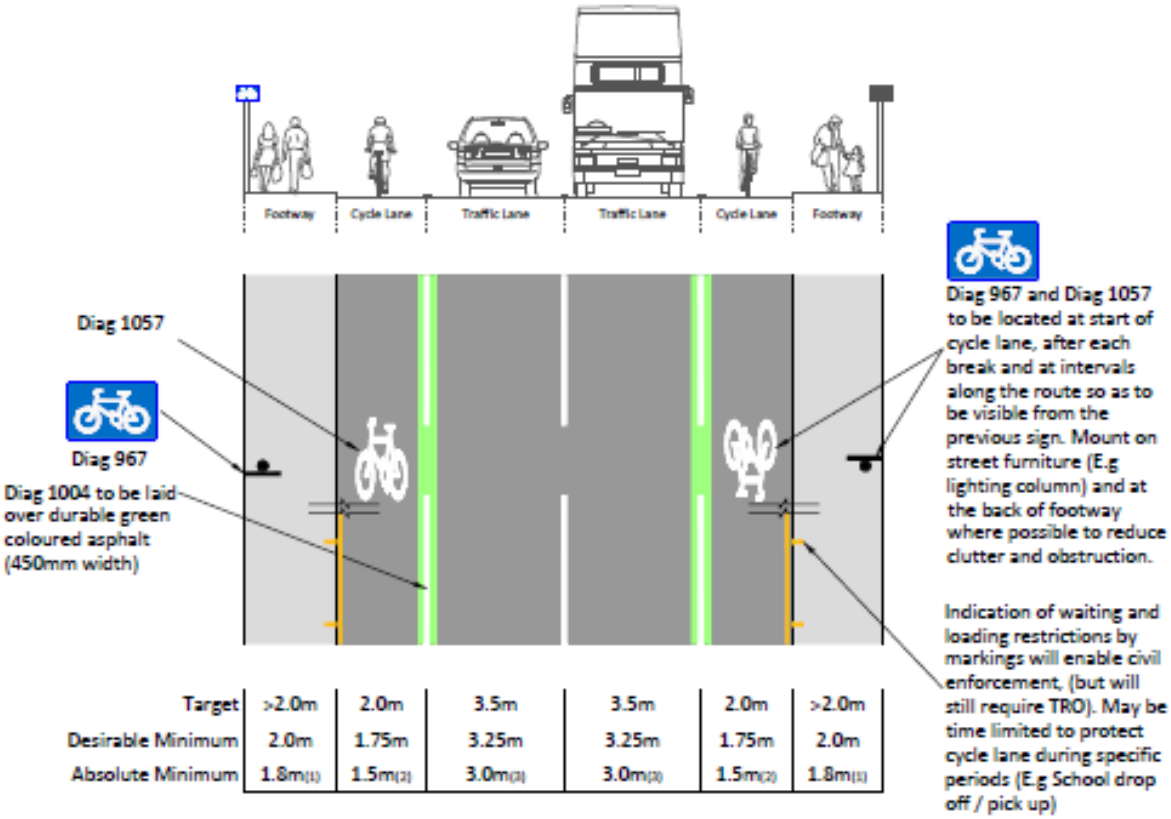
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CL-GE-01	Rev: A
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	1.75m	3.25m	3.25m	1.75m	2.0m
Absolute Minimum	1.8m(1)	1.5m(2)	3.0m(3)	3.0m(3)	1.5m(2)	1.8m(1)

1. Localised narrowing of footway due to street furniture permitted - need to reflect pedestrian flows.
2. (It is recommended that the absolute minimum cycle track width of 1.5m is only considered over short distances (<100m) and where the gradient is <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
- Reduced width requirements compared to physical segregation options.
- Easier continuation at junctions than physically segregated options.
- Allows cyclists to freely enter and exit the cycle lane

Disadvantages:

- Indicative only - no statutory backing
- Largely ignored by other road users
- Supporting 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.
- Durable green coloured asphalt surfacing to be provided at the beginning and end of Advisory cycle lane and adjacent to the longitudinal Diag 1004 road marking to raise conspicuousness of cycle lane.
- Requires 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

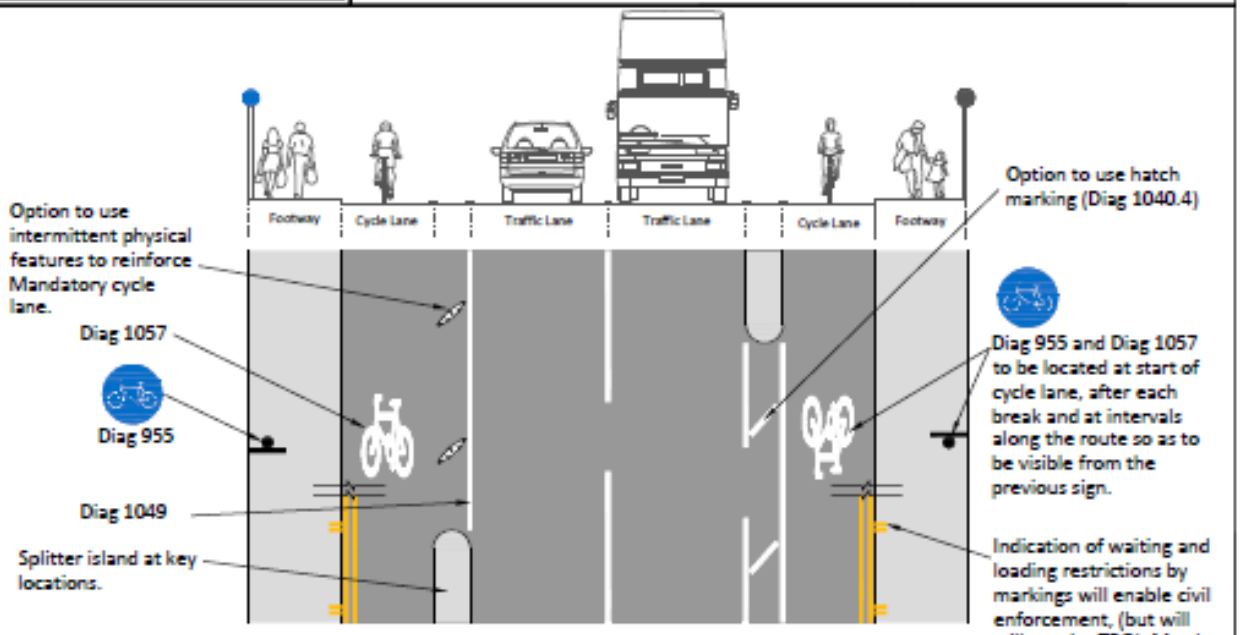
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

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

Transport for Greater Manchester

Title:

'LIGHT' SEGREGATION OPTION 1
0.45m - 0.725m BUFFER ZONE



Target	>2.0m	2.5m	0.45m(5)	3.5m	3.5m	0.725m(5)	2.5m	>2.0m
Desirable Minimum	2.0m(1)	2.0m(3)		3.25m	3.25m		2.0m(3)	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(4)		3.0m(6)	3.0m(6)		1.5m(4)	1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m may be justified where not considered to compromise pedestrian and mobility impaired movement and/or where street furniture exists.
3. 2.0m cycle lane width accommodates overtaking cyclists, hence 2.0m is the desirable minimum width (else risk of overtaking cyclist conflicting with segregation feature).
4. Absolute minimum cycle lane width only permitted over distances < 100m; on gradients < 7%).
5. 0.7m buffer zone dictated by width requirements for chevron markings and/or angled 'Armadillo' physical features (or similar).
6. See Table 7, Chapter 2 for minimum general traffic lane widths. 3.0m considered to be an acceptable minimum in most instances on links with a 30mph speed limit, including on bus routes.

Advantages:

- Lower implementation cost
- Reduced construction time
- Better cycle access / permeability with cyclists able to enter and exit the cycle lane between physical features
- Provides greater flexibility to maintain access to private driveways or similar through the natural gaps created by a light segregation approach
- Reduced drainage requirements and implications when compared to full segregation by kerblines
- Flexible arrangement which can easily revert to conventional cycle lanes across side roads and through signal controlled junctions

Disadvantages:

- Requires wide kerb to kerb width
- TRO required for Mandatory cycle lane
- 0.725m buffer zone with a road marking approach increases separation between cyclists and general traffic but does not offer consistent physical protection and can also reduce the potential available width for the cycle lane
- Requires the Highway Authority to accept the risk of liability relating to street furniture / physical separating features (such as Armadillos)

Key Criteria / Commentary:

- Splitter island recommended at the start and end of each section of light segregation, and potentially at intervals in between as deemed appropriate.
- In the sections between splitter islands, the buffer zone can be created by either road markings alone (see right hand side of above drawing), or by the use of intermittent physical features on the inside of the Mandatory cycle lane marking making it unambiguous to drivers that this is a lane they must not enter (see left hand side of above drawing).
- Consistent quality is essential. This includes consistent cycle track/lane width and no gaps in provision.
- Sufficient road width must be available to cater for general traffic (3.0m min per lane).
- Parking and loading not permitted in cycle track/lane and must be provided elsewhere if required. This may require reinforcement with parking and loading restrictions.
- Sections of durable green coloured asphalt surfacing recommended at the beginning, the end, and at key conflict points of the cycle track/lane in order to raise conspicuousness of cycle facility to other road users.
- Requires 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	£160,000
Upper Cost Estimate	£1,000,000

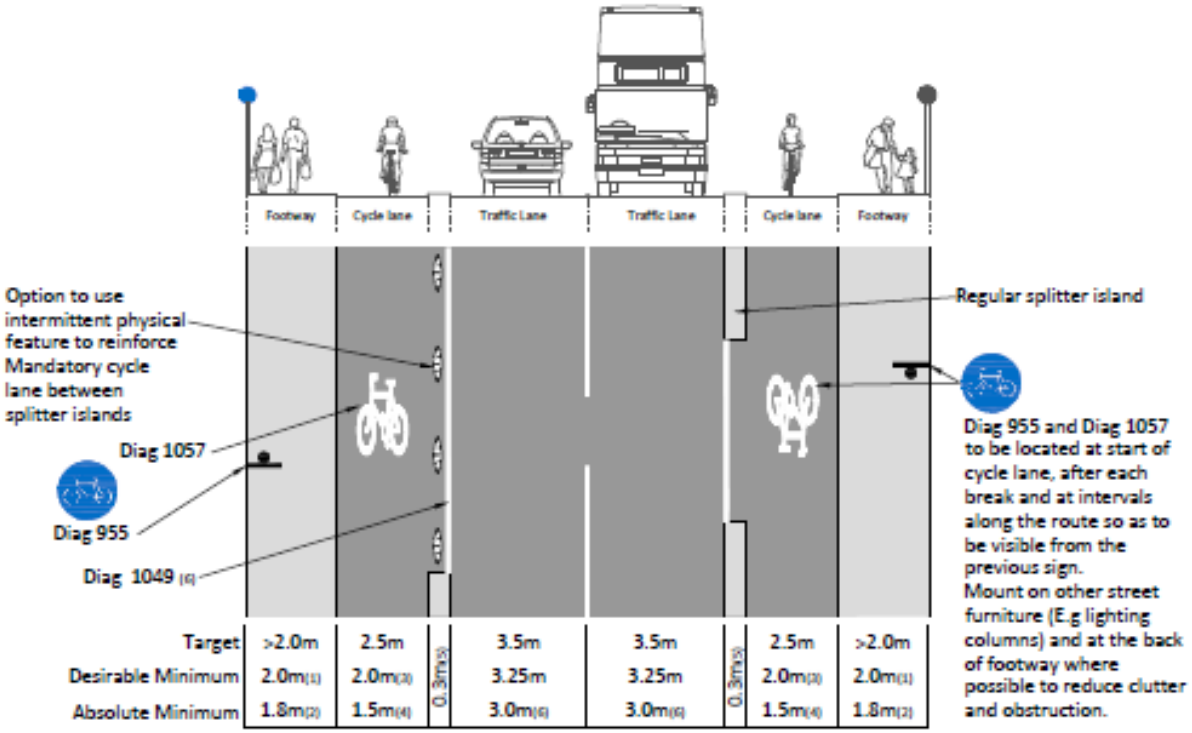
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

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

Transport for Greater Manchester

Title:

'LIGHT' SEGREGATION OPTION 2
0.3m BUFFER ZONE



Target	>2.0m	2.5m	0.3m(5)	3.5m	3.5m	0.3m(5)	2.5m	>2.0m
Desirable Minimum	2.0m(1)	2.0m(3)		3.25m	3.25m		2.0m(3)	2.0m(1)
Absolute Minimum	1.8m(2)	1.5m(4)		3.0m(6)	3.0m(6)		1.5m(4)	1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m may be justified where not considered to compromise pedestrian and mobility impaired movement and/or where street furniture exists.
3. 2.0m cycle track width accommodates overtaking cyclists, hence 2.0m is the desirable minimum width (else risk of overtaking cyclist conflicting with segregation feature).
4. It is recommended that the absolute minimum cycle track width of 1.5m is only considered over short distances (<100m) and where the gradient is <7%.
5. 0.3m buffer zone dictated by minimum recommended width for splitter islands.
6. See Table 7, Chapter 2 for minimum general traffic lane widths. 3.0m considered to be an acceptable minimum in most instances on links with a 30mph speed limit, including on bus routes.

Advantages:

- Lower implementation cost
- Reduced construction time
- Better cycle access / permeability with cyclists able to enter and exit the cycle lane between physical features
- Provides greater flexibility to maintain access to private driveways or similar through the natural gaps created by a light segregation approach
- Reduced drainage requirements and implications when compared to full segregation by kerblines
- Flexible arrangement which can easily revert to conventional cycle lanes across side roads and through junctions
- Reduced width of separator at 0.3m offers potential to maximise the cycle lane width

Disadvantages:

- Requires wide kerb to kerb width
- TRO required for Mandatory cycle lane
- Reduced separation width between cyclists and general traffic
- Requires the Highway Authority to accept the risk of liability relating to street furniture / physical separating features (such as Armadillos)

Key Criteria / Commentary:

- Splitter island recommended at the start and end of each section of light segregation, and potentially at intervals in between as deemed appropriate.
- In the sections between splitter islands, the Mandatory cycle lane can potentially be reinforced by the use of intermittent 'in line' physical features (such as Armadillos) on the inside of the Mandatory cycle lane marking making it unambiguous to drivers that this is a lane they must not enter.
- Consistent quality is essential. This includes consistent cycle track/lane width and no gaps in provision.
- Sufficient road width must be available to cater for general traffic (3.0m min).
- Parking and loading not permitted in cycle track/lane and must be provided elsewhere if required. This may require reinforcement with parking and loading restrictions.
- Sections of durable green coloured asphalt surfacing recommended at the beginning, the end, and at key conflict points of the cycle track/lane in order to raise conspicuousness of cycle facility to other road users.
- Requires 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	£160,000
Upper Cost Estimate	£1,000,000

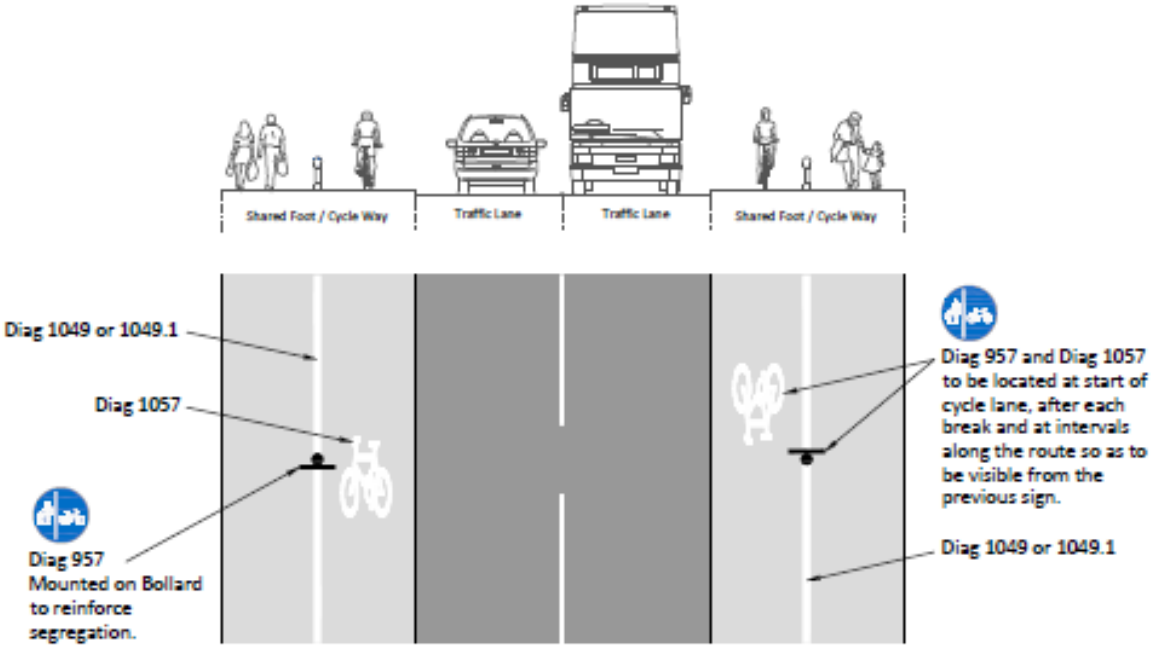
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

Drawing No:	L-CL-GE-04	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)	3.0m(4)	3.0m(4)	4.0m(2)&(3)

1. Effective width.
2. Localised narrowing of footway due to street furniture permitted.
3. It is recommended that the absolute minimum cycle track width is only considered over short distances (<100m) and where the gradient is <7%.
4. See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- Provides physical segregation from motorised traffic
- Lower cost option than dedicated cycle tracks
- Generally preferable to unsegregated as pedestrian and cycle areas are both clearly marked

Disadvantages:

- Cyclists mixed with pedestrians resulting in potential conflict
- Cyclists lose priority across side roads and accesses with associated safety issues
- Often suffer from poor route continuity with shared use facility required to revert to on-carriageway cycle lanes through junctions

Key Criteria / Commentary:

- Often created by converting a footway to shared use
- 4.0m generally regarded as the absolute minimum acceptable width
- Only appropriate where either low pedestrian or low cycle demands exist
- 24 hour operation
- No coloured surfacing requirements
- Requires smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads/driveway accesses intersect cycleway

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: A
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

SHARED FOOTWAY / CYCLEWAY - UNSEGREGATED

Diag 956 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. Mount on other street furniture (E.g Lighting column) and at the back of footway where possible to reduce clutter and obstruction.

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. It is recommended that the absolute minimum cycle track width is only considered over short distances (<100m) and where the gradient is <7%.
4. See Table 7, Chapter 2 for minimum general traffic lane widths.

Advantages:

- Provides physical segregation from motorised traffic
- Reduced width requirements compared to many other forms of cycling provision
- Lower cost option than dedicated cycle tracks

Disadvantages:

- Cyclists mixed with pedestrians resulting in potential conflict.
- No clear priority for pedestrians or cyclists
- Cyclists lose priority across side roads and accesses with associated safety issues
- Often suffer from poor route continuity with shared use facility required to revert to on-carriageway cycle lanes through junctions

Key Criteria:

- Often created by converting a footway to shared use
- 3.0m generally regarded as the minimum acceptable width
- Only appropriate where either low pedestrian or low cycle demands exist
- 24 hour operation
- No coloured surfacing requirements
- Requires smooth, flat, well-drained and well-maintained surface
- Not suitable where frequent side roads/driveway accesses intersect cycleway

Typical Costs:

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

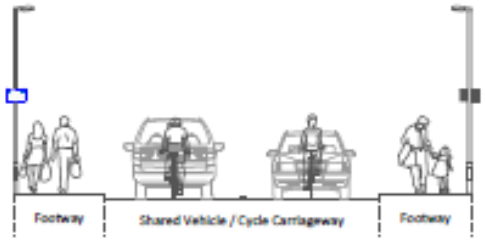
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

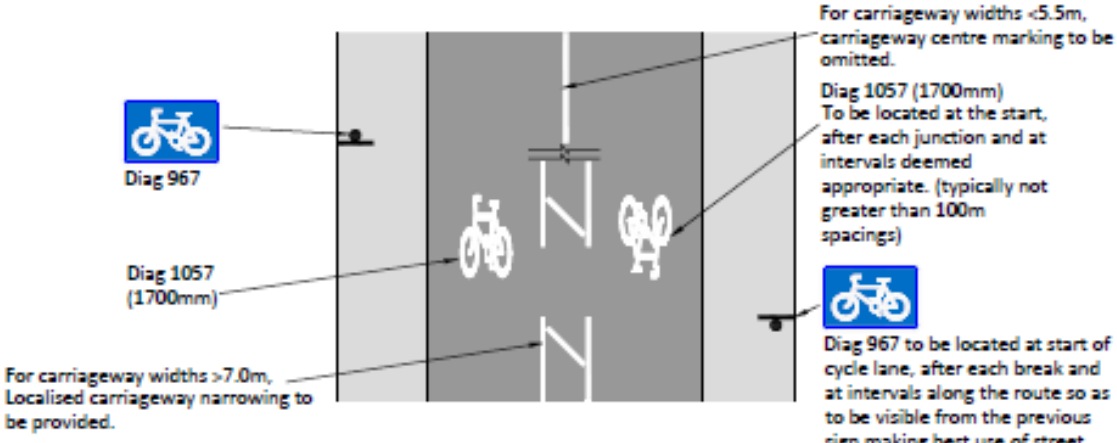
Drawing No:	L-SF-GE-02	Rev: A
Lead Section:	LINKS	

Transport for Greater Manchester

Title:

QUIET STREET





Target	>2.0m		>2.0m
Desirable Minimum	2.0m(1)	7.0m max available carriageway (3)	2.0m(1)
Absolute Minimum	1.8m(2)		1.8m(2)

1. Footway width provision should reflect pedestrian flow. 2.0m is considered the desirable minimum width.
2. Localised narrowing (<100m) of footway to 1.8m effective width may be justified where not considered to compromise pe and mobility impaired movement and/or where street furniture exists.
3. Not considered suitable for general traffic lanes > 3.5m (hence 7.0m maximum unless localised narrowing is provided)

Advantages:

- Solution for narrow streets where there is insufficient width to accommodate cycle tracks or cycle lanes.
- Provides continuity of designated cycle routes in such situations.
- Raises conspicuity of cycle route / presence of cyclist to motorised vehicles.

Disadvantages:

- No formal provision of protection for less confident cyclists.
- Only suitable in 20mph zones with low traffic volumes.

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 should Diagram 1057 markings supplement any supporting traffic calming features.
- Desgners responsible for careful positioning of Diagram 1057 markings in order to maximise effectiveness but to minimise 'street clutter' and associated maintenance liability.

Typical Costs:

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

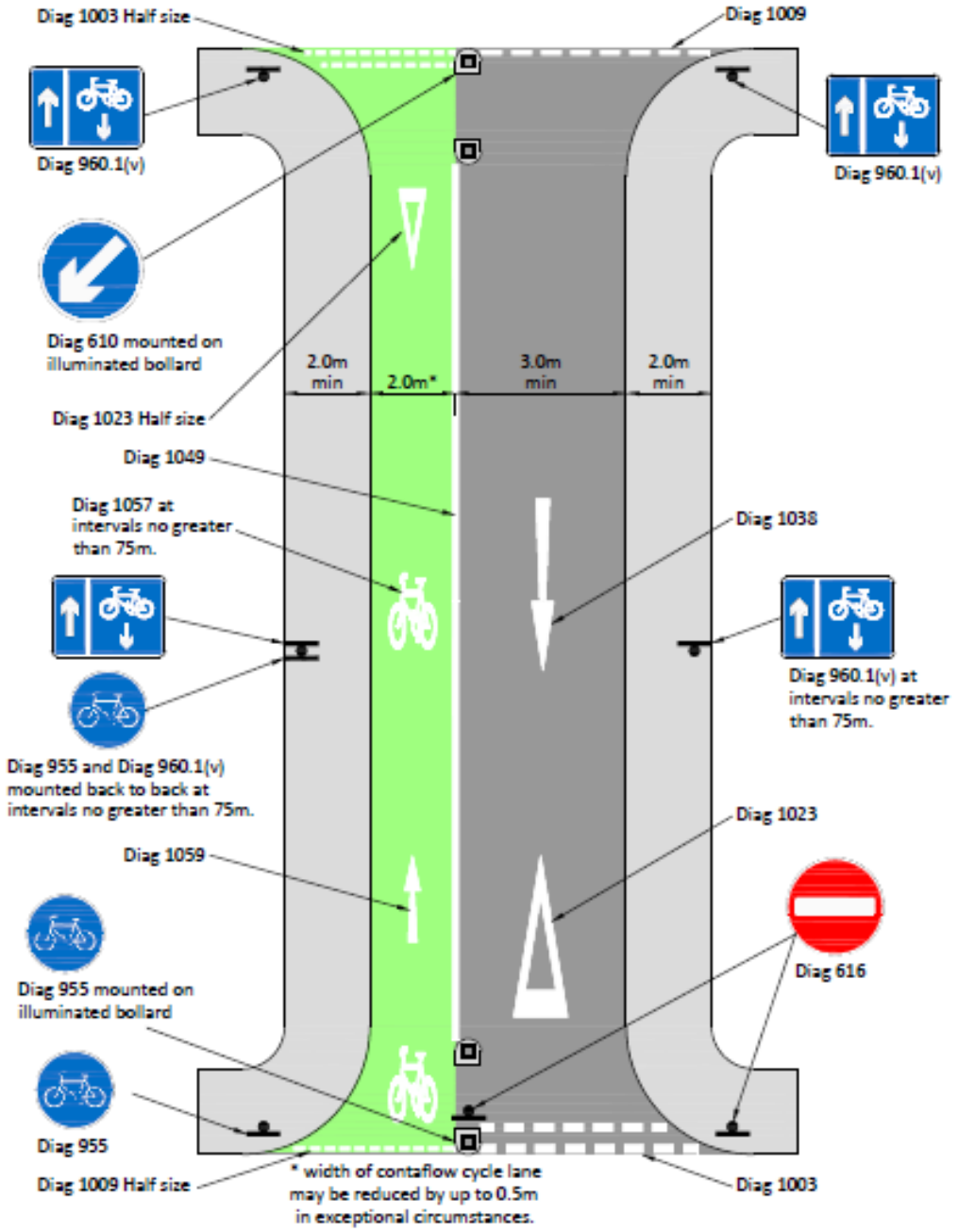
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on both sides of the carriageway.

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

Transport for Greater Manchester

Title:

MANDATORY CONTRAFLOW CYCLE LANE



Key Criteria / Commentary:

- 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:

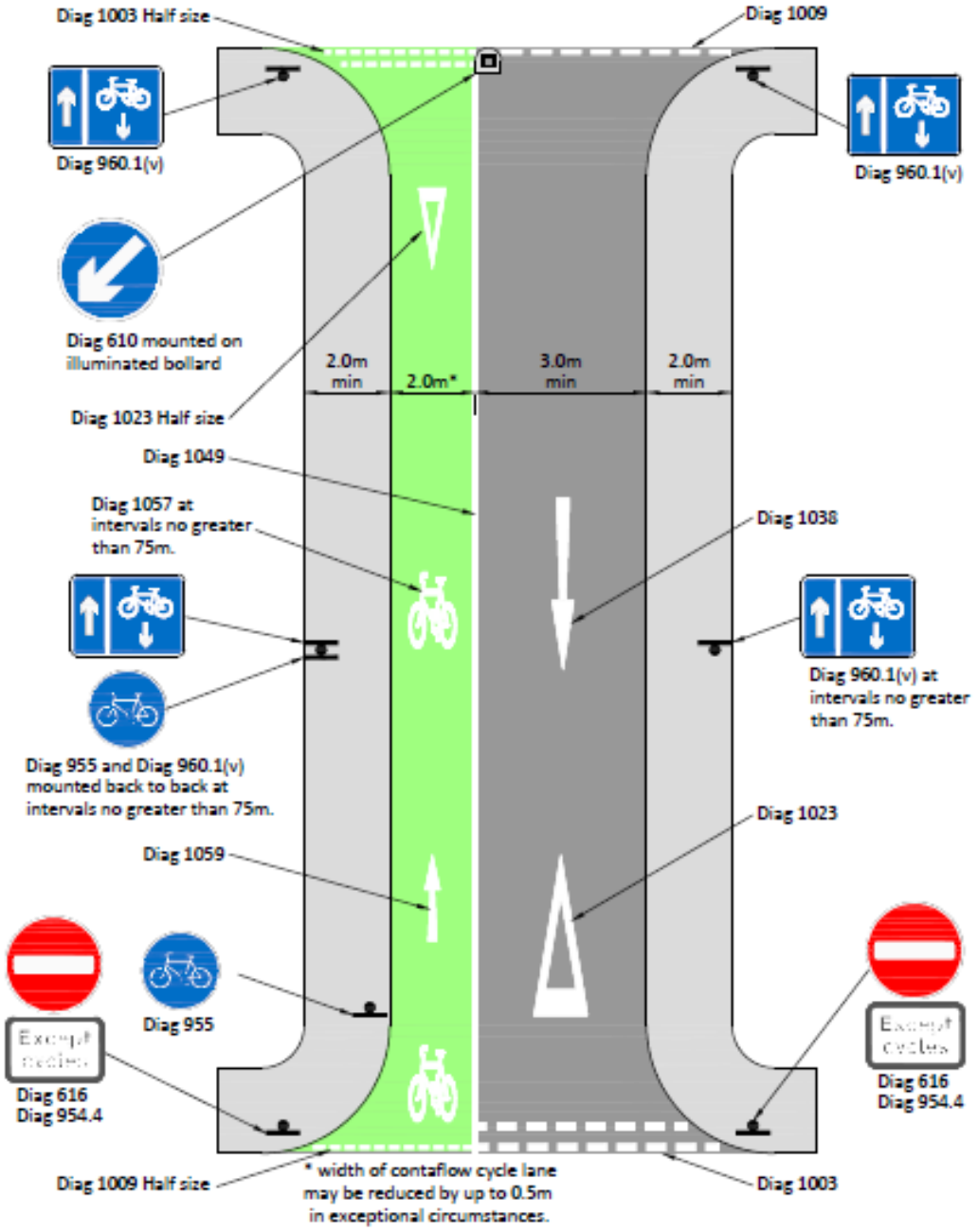
Work Zone Length	1000m
Lower Cost Estimate	£80,000
Upper Cost Estimate	£100,000

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

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

Transport for Greater Manchester

Title: MANDATORY CONTRAFLOW CYCLE LANE WITHOUT ENTRY ISLAND



Key Criteria / Commentary:

- 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.

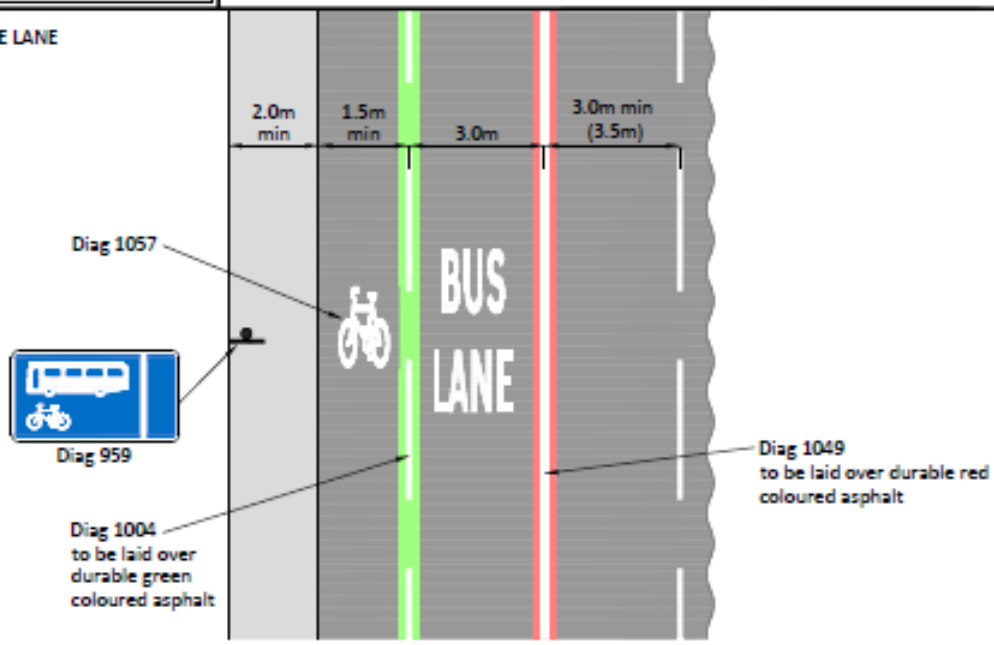
Drawing No:	L-CL-CF-02	Rev: A
Lead Section:	LINKS	

Transport for Greater Manchester

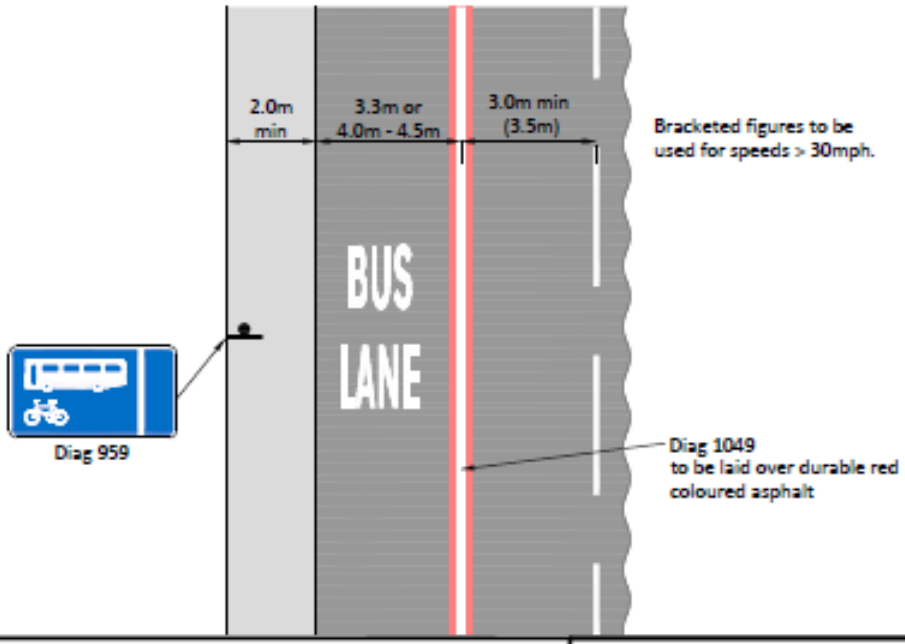
Title:

CYCLE LANE WITHIN A BUS LANE

BUS AND CYCLE LANE



BUS LANE



Key Criteria / Commentary:

- 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 Bus Lane should be 3.3m. This prevents bus drivers from misjudging clearances when overtaking and reduces the likelihood of carriageway rutting as occurs where bus lanes are less than 3.3m. Cycles are still allowed to use the Bus Lane with buses required to use part of the general traffic lane when overtaking.
- Bus Lane widths of 3.3m - 3.9m should be avoided as bus drivers attempt to overtake cyclists within the confines bus lane, raising safety concerns.
- 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)

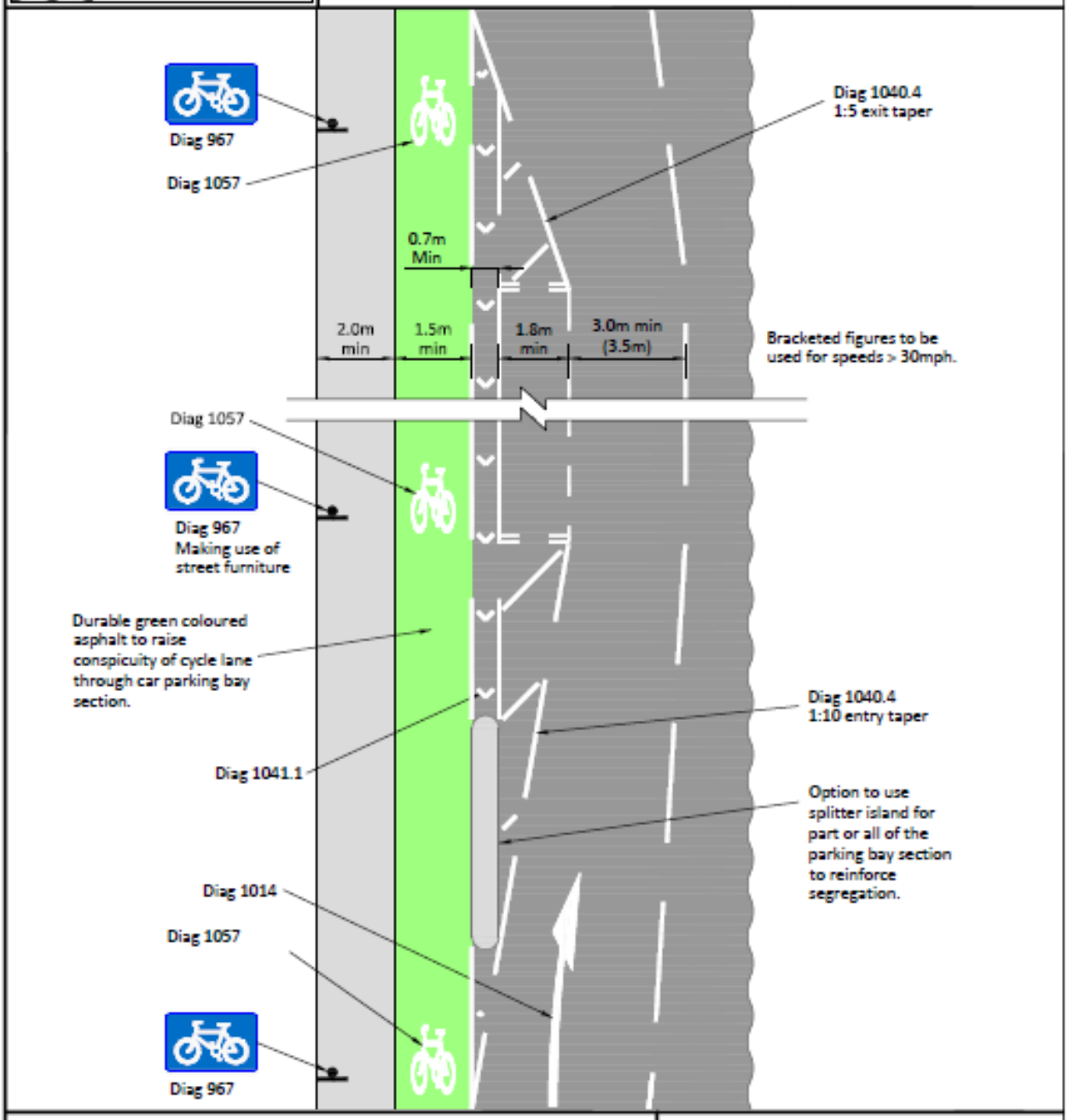
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Bracketed figure are Bus Lane Only.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility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

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

Transport for Greater Manchester

Title:

CYCLE LANE AT PARKING BAYS
OPTION 1 - 'FLOATING' PARKING BAYS



Key Criteria / Commentary:

- Parking bays provide a buffer between cyclists and general traffic. As such this arrangement is generally preferable to L-CL-PK-02 where cyclists are placed in a more dangerous position next to general traffic
- 0.7m buffer as indicated provides some clearance from opening car doors. 1.0m buffer preferable where this can be achieved, with 0.5m buffer considered an absolute minimum
- 2.0m cycle lane width preferred, but 1.5m considered an acceptable minimum where space is constrained and over sections <100m in length
- Continuous or closely spaced splitter islands preferred along the length of the parking bays so as to remove potential for parked vehicles to be tempted to cross the chevron markings and park kerbside, thereby obstructing the cycle lane
- Assuming 1.5m (min) cycle lane and a 0.7m buffer, required total half carriageway width from kerb face to centre line is 7.0m
- Potential to 'bend in' the cycle lane through footway narrowing to reduce half carriageway width requirements (ensuring maintain appropriate footway widths)
- Durable green coloured asphalt surfacing recommended through parking bay zone to increase the conspicuousness of the cycle lane
- Where there are high levels of loading and unloading activity requiring frequent crossing of the cycle lane, consideration should be given to the arrangement shown in L-CL-PK-02 as an alternative

Typical Costs:

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

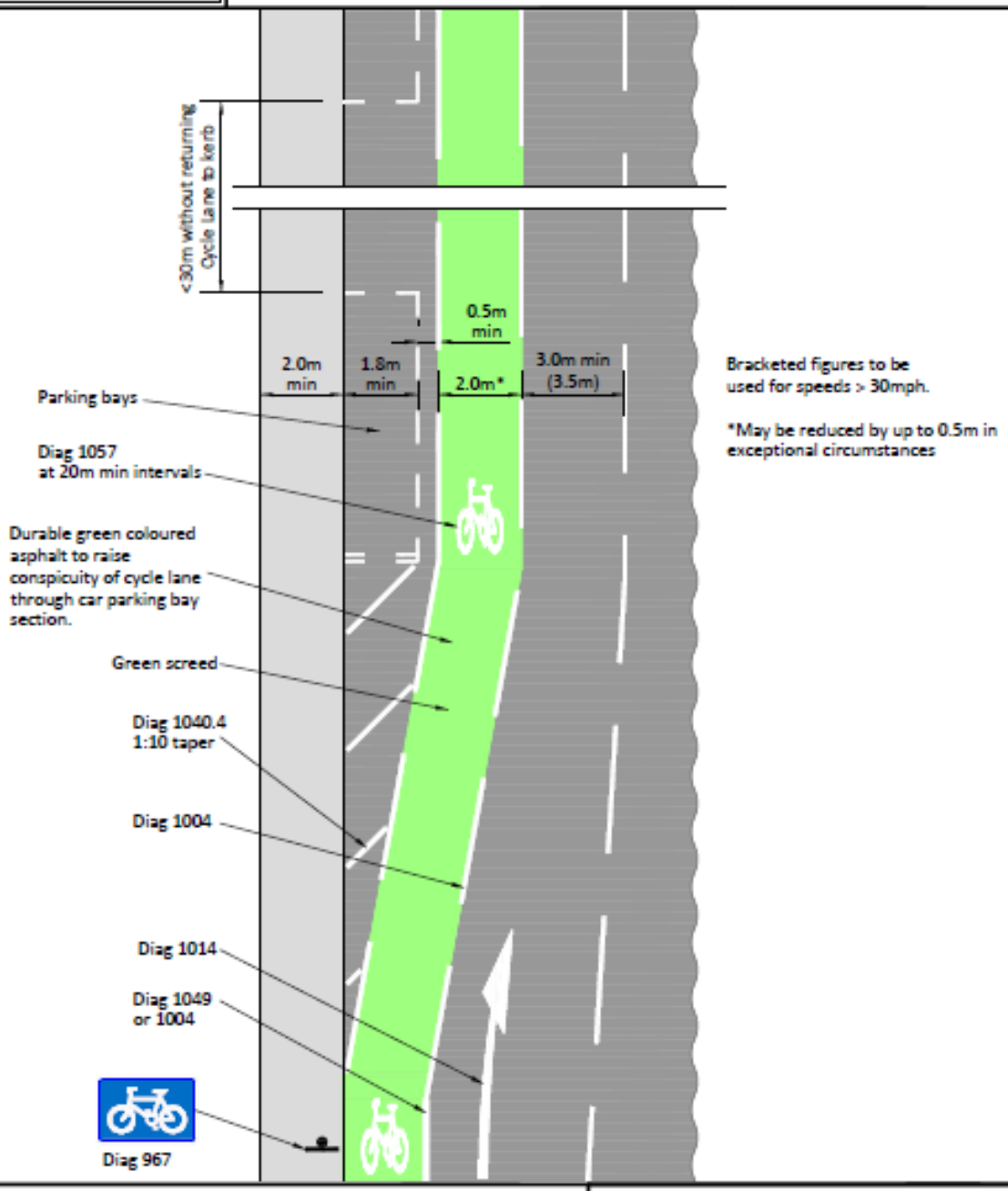
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

CYCLE LANE AT PARKING BAYS
OPTION 2 - CYCLE LANE 'BEND OUT'



Key Criteria:

- This arrangement is not as desirable as L-CL-PK-01 as cyclists are 'sandwiched' between parked vehicles and general traffic and are therefore more vulnerable
- Given the above, a 2.0m wide cycle lane is recommended along the length of the parking bays to provide cyclists with potential for lateral movement as required
- 0.5m minimum clearance required between parking bay and cycle lane to provide some clearance from opening car doors (1.0m clearance preferred)
- Assuming 2.0m cycle lane and a 0.5m clearance, required total half carriageway width from kerb face to centre line is 7.3m
- Potential to inset the parking bays through footway narrowing to reduce half carriageway width requirements (ensuring maintain appropriate footway widths)
- Durable green coloured asphalt surfacing recommended through parking bay zone to increase the conspicuousness of the cycle lane
- This arrangement should be considered where there are high levels of loading and unloading activity requiring frequent crossing of the cycle lane

Typical Costs:

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

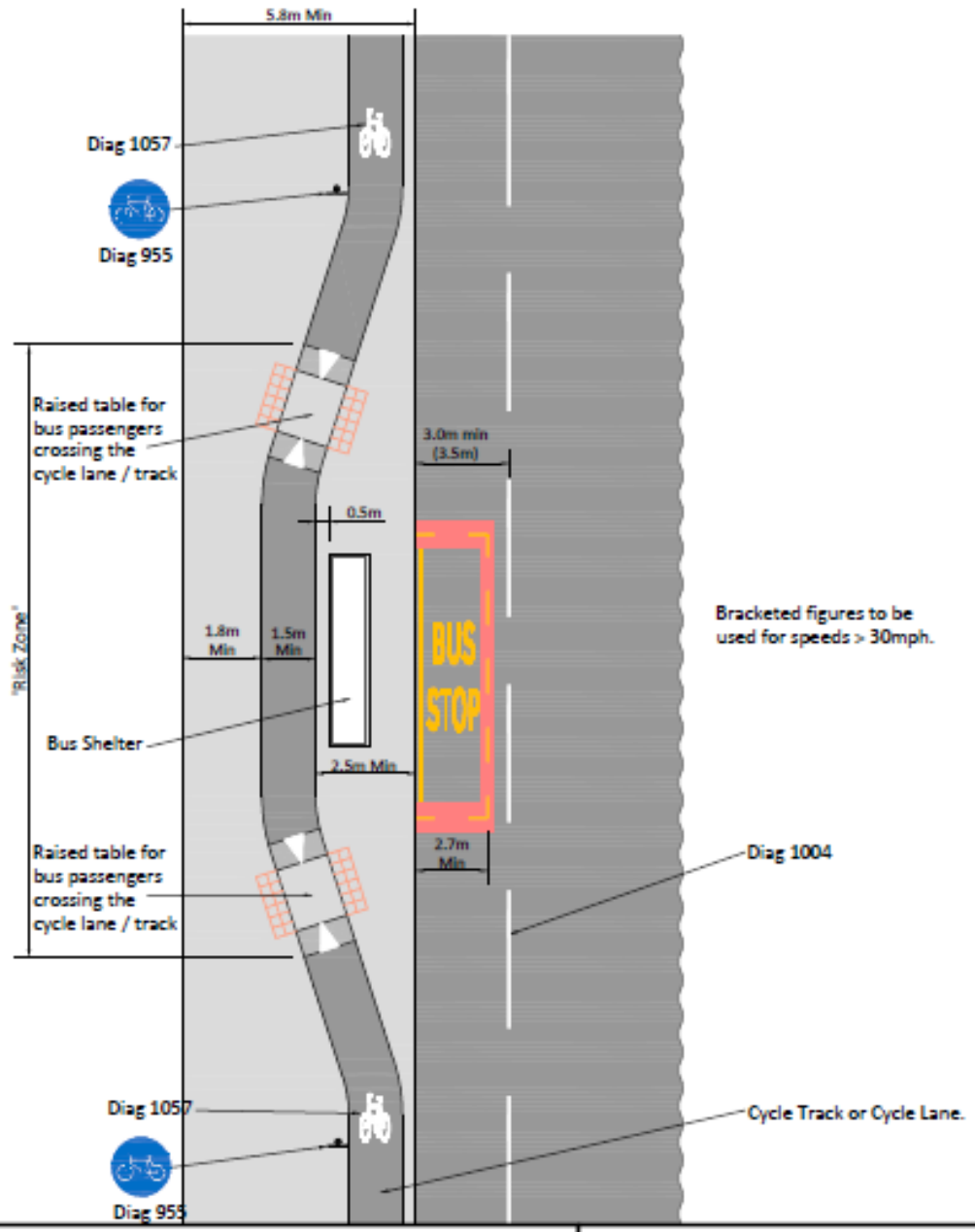
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

BUS STOP OPTION 1A - 'ISLAND' BUS STOP WITH BEND IN CYCLE TRACK



Bracketed figures to be used for speeds > 30mph.

Key Criteria / Commentary:

- Minimises conflicts as keeps cyclists away from buses whilst also providing a clearly differentiated space for cyclists and pedestrians with the associated level difference (footway and bus stop island are raised in comparison to the cycle track which is at the same height as the carriageway)
- 'Bend in' of cycle track helps to slow cyclists through the bus stop 'risk zone' where cyclists mix with pedestrians
- 2.5m minimum island width recommended in order to provide a safe waiting and bus boarding and alighting area, in particular for the mobility impaired
- Assuming a 1.8m minimum footway width and a 1.5m minimum cycle track width, results in a total back of footway to carriageway kerb face width requirement of 5.8m for the full length of bus stopping area, including approach and exit
- 1.5m minimum cycle track width suitable for short sections only (<100m) as it restricts overtaking opportunities
- Suitable for corridors with higher bus flows (>12 buses per hour per direction) where keeping cyclists on carriageway would result in regular conflicts with stopping buses
- Pedestrians are required to yield to cyclists when crossing from footway to bus stop island. *Note: Subject to the mix of pedestrians and cyclists in terms of volume, there may be a case for considering the inclusion of Zebra crossings at the pedestrian crossing points such that cyclists yield to pedestrians.*

Typical Costs:

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

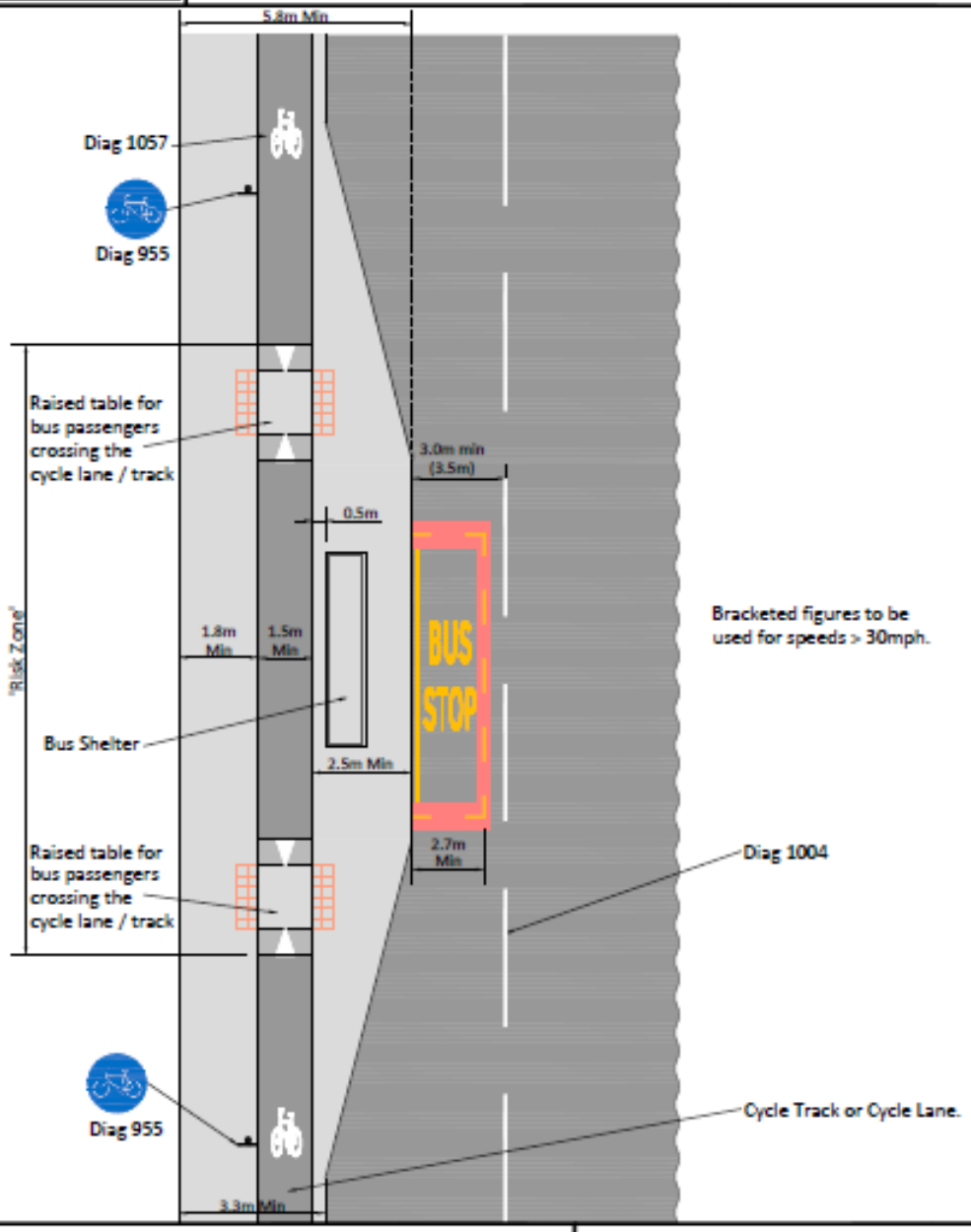
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

BUS STOP OPTION 1B - 'ISLAND' BUS STOP WITH IN LINE CYCLE TRACK



Key Criteria / Commentary:

- Minimises conflicts as keeps cyclists away from buses whilst also providing a clearly differentiated space for cyclists and pedestrians with the associated level difference.
- 'In Line' cycle lane/track reduces width requirements over an extended length.
- Assuming a 1.8m minimum footway width and a 1.5m minimum cycle track width, results in a total back of footway to carriageway kerb face width requirement of 5.8m at the localised section of bus border buildout
- Straight alignment of cycle track is less likely to slow cyclists through the bus stop 'risk zone' where cyclists mix with pedestrians when compared with Options 1A and 1C
- 2.5m minimum island width recommended in order to provide a safe waiting and bus boarding and alighting area, in particular for the mobility impaired
- 1.5m minimum cycle track width suitable for short sections only (<100m).
- Potential requirement to consider hatch markings and/or kicker arrow on the general traffic approach the bus border buildout
- Suitable for corridors with higher bus flows (>12 buses per hour per direction) where keeping cyclists on carriageway would result in regular conflicts with stopping buses
- Pedestrians are required to yield to cyclists when crossing from footway to bus stop island. *Note: Subject to the mix of pedestrians and cyclists in terms of volume, there may be a case for considering the inclusion of Zebra crossings at the pedestrian crossing points such that cyclists yield to pedestrians.*

Typical Costs:

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

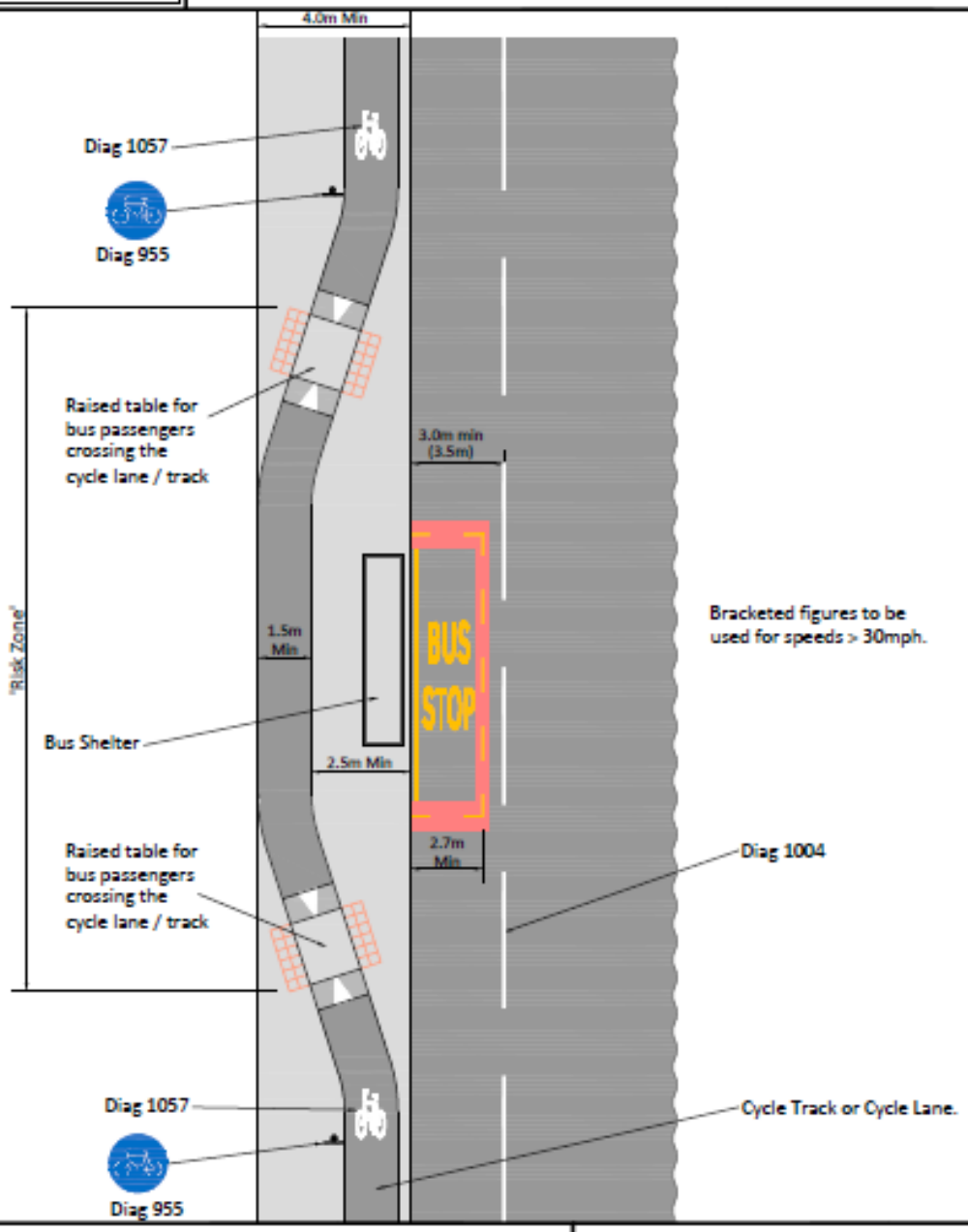
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

BUS STOP OPTION 1C - 'ISLAND' BUS STOP WITH CYCLE TRACK TO BACK OF FOOTWAY



Bracketed figures to be used for speeds > 30mph.

Key Criteria / Commentary:

- Minimises conflicts as keeps cyclists away from buses whilst also providing a clearly differentiated space for cyclists and pedestrians with the associated level difference.
- 'Bend in' of cycle track helps to slow cyclists through the bus stop 'risk zone' where cyclists mix with pedestrians
- 2.5m minimum island width recommended in order to provide a safe waiting and bus boarding and alighting area, in particular for the mobility impaired
- Assuming a 1.5m minimum cycle track width and a 2.5m minimum island width, results in a total back of footway to carriageway kerb face minimum width requirement of 4.0m through bus stopping area. This is a reduced width requirement compared to Options 1A and 1B
- 1.5m minimum cycle track width suitable for short sections only (<100m).
- Suitable for corridors with higher bus flows (>12 buses per hour per direction)
- All pedestrians including those who are not bus passengers are required to cross the cycle track to make use of the bus stop island
- Pedestrians are required to yield to cyclists when crossing from footway to bus stop island. *Note: Subject to the mix of pedestrians and cyclists in terms of volume, there may be a case for considering the inclusion of Zebra crossings at the pedestrian crossing points such that cyclists yield to pedestrians.*
- This arrangement is only suitable where is no back of footway land use requiring pedestrian access

Typical Costs:

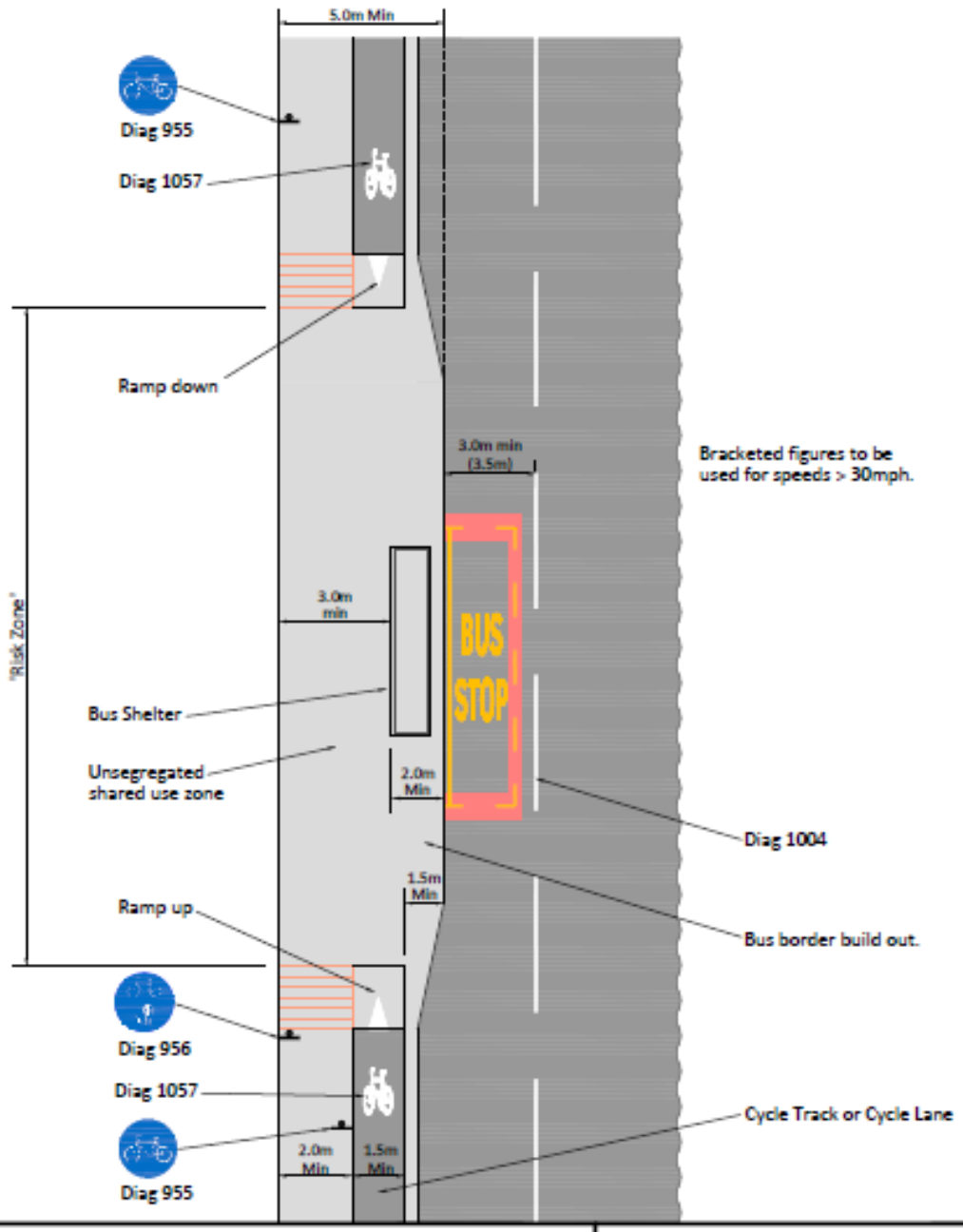
Work Zone Length	75m
Lower Cost Estimate	£50,000
Upper Cost Estimate	£200,000

- 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-01C	Rev:
Lead Section:	LINKS	

Transport for Greater Manchester

Title: BUS STOP OPTION 2 - BUS BORDER WITH SHARED USE FOOTWAY / CYCLEWAY



Key Criteria / Commentary:

- Cyclists required to use a ramp up to mix with pedestrians at the same grade within a shared use area behind the bus stop shelter (3.0m min)
- Cyclists are kept away from conflicts with buses and general traffic
- Only considered suitable at locations where there is low pedestrian footfall and low bus stop usage (<12 buses per hour per direction) in order to minimise likelihood of pedestrian and cyclists conflicts
- 2.0m minimum width required between back of shelter and kerb face in order to provide a safe waiting and bus boarding and alighting area, in particular for the mobility impaired. This requires a minimum 1.5m bus border buildout in order to achieve the desired width
- Assuming a 3.0m minimum shared use width and a 2.0m minimum bus boarding/alighting area, results in a total back of footway to carriageway kerb face minimum width requirement of 5.0m through bus stopping area. This is a reduced width requirement compared to Options 1A and 1B but greater than Option 1C

Typical Costs:

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

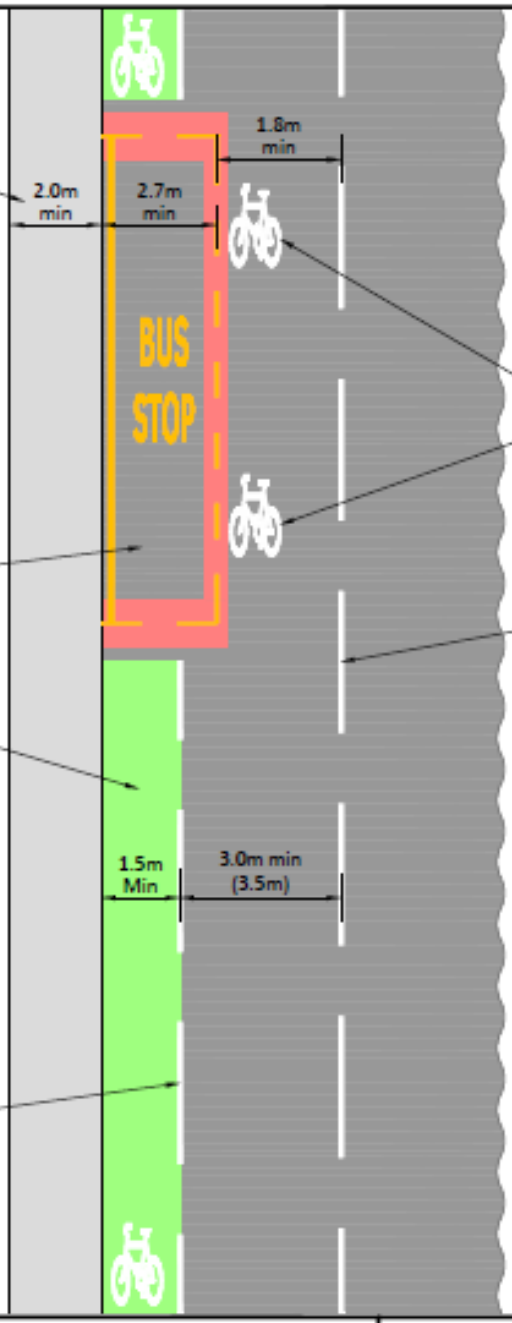
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

BUS STOP OPTION 3 - 'IN LINE' CYCLE LANE



Key Criteria / Commentary:

- Cyclists remain on carriageway throughout bus stop zone
- Only considered suitable for corridors with lower bus flows (<12 buses per hour per direction) such that there is reduced likelihood of cyclists being required to negotiate a stopped bus
- Keeps pedestrians (and bus passengers) wholly segregated from cyclists and general traffic
- Use of Diagram 1057 markings next to bus stop cage raises conspicuousness of cyclists presence to general traffic when a bus is stopped and cyclists are required to overtake
- Reduced width requirements compared to Options 1 and 2 with a minimum half carriageway width of 4.5m

Typical Costs:

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

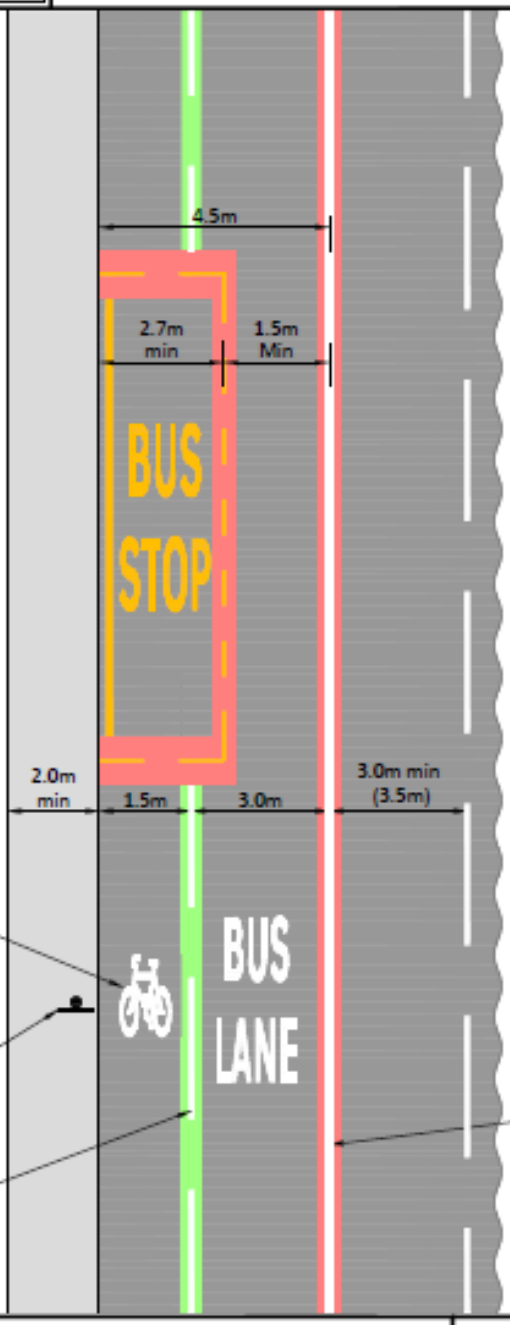
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

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

Transport for Greater Manchester

Title:

BUS STOP OPTION 4
CYCLE LANE AT BUS STOP WITHIN BUS LANE



Key Criteria / Commentary:

- Cyclists remain on carriageway throughout bus stop zone
- Assuming a 4.5m bus and cycle lane, cyclists are able to overtake a stopped bus within the confines of the bus lane without interacting with general traffic
- Keeps pedestrians (and bus passengers) wholly segregated from cyclists and general traffic

Typical Costs:

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

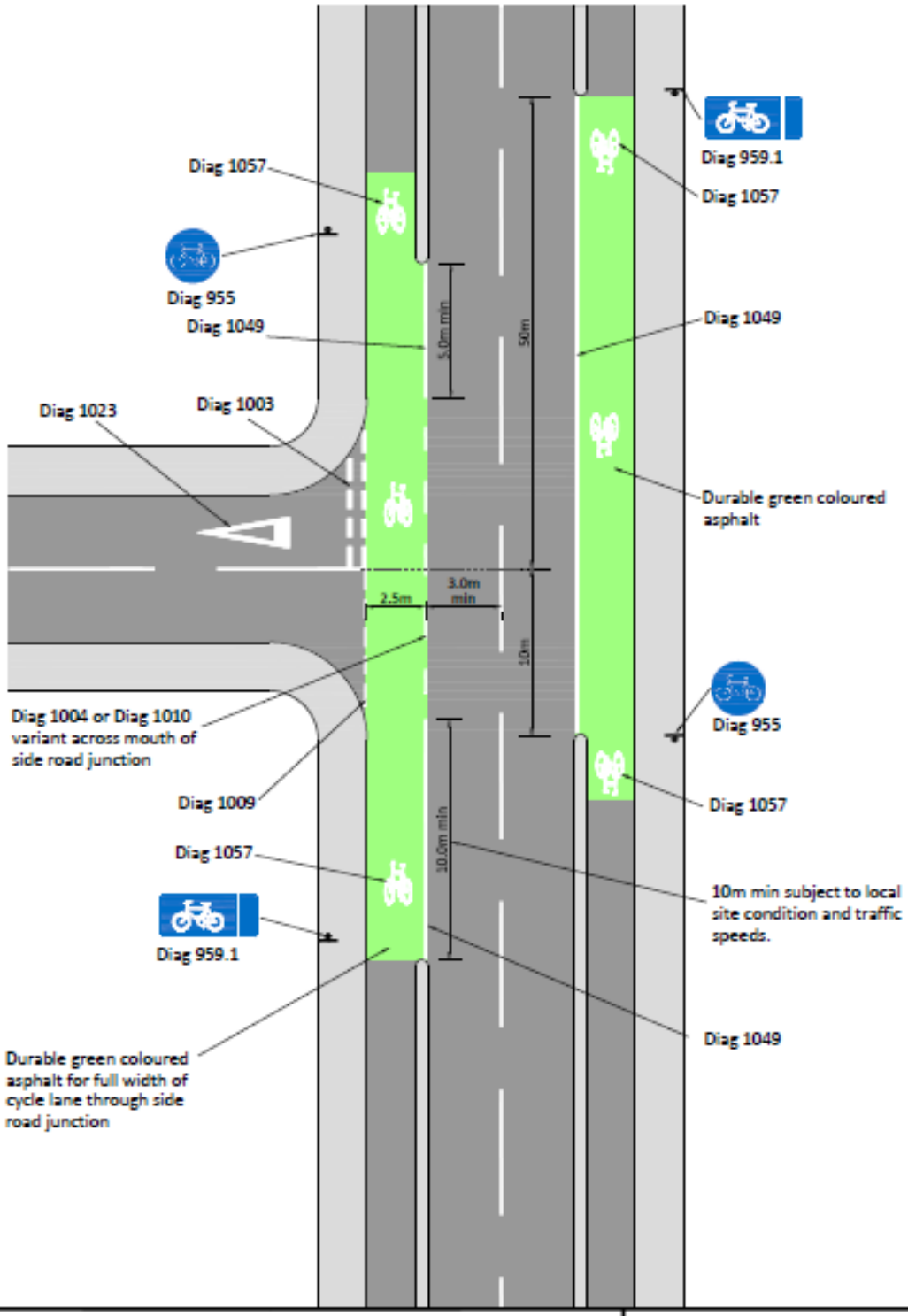
- Cost estimates are indicative only and can vary significantly depending upon local site conditions.
- Lower cost value based on minimal engineering interventions
- Upper cost value based on maximum engineering interventions
- Cost estimate assume cycle facility provisions on one side of the carriageway.

Drawing No:	L-CL-BS-02	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:

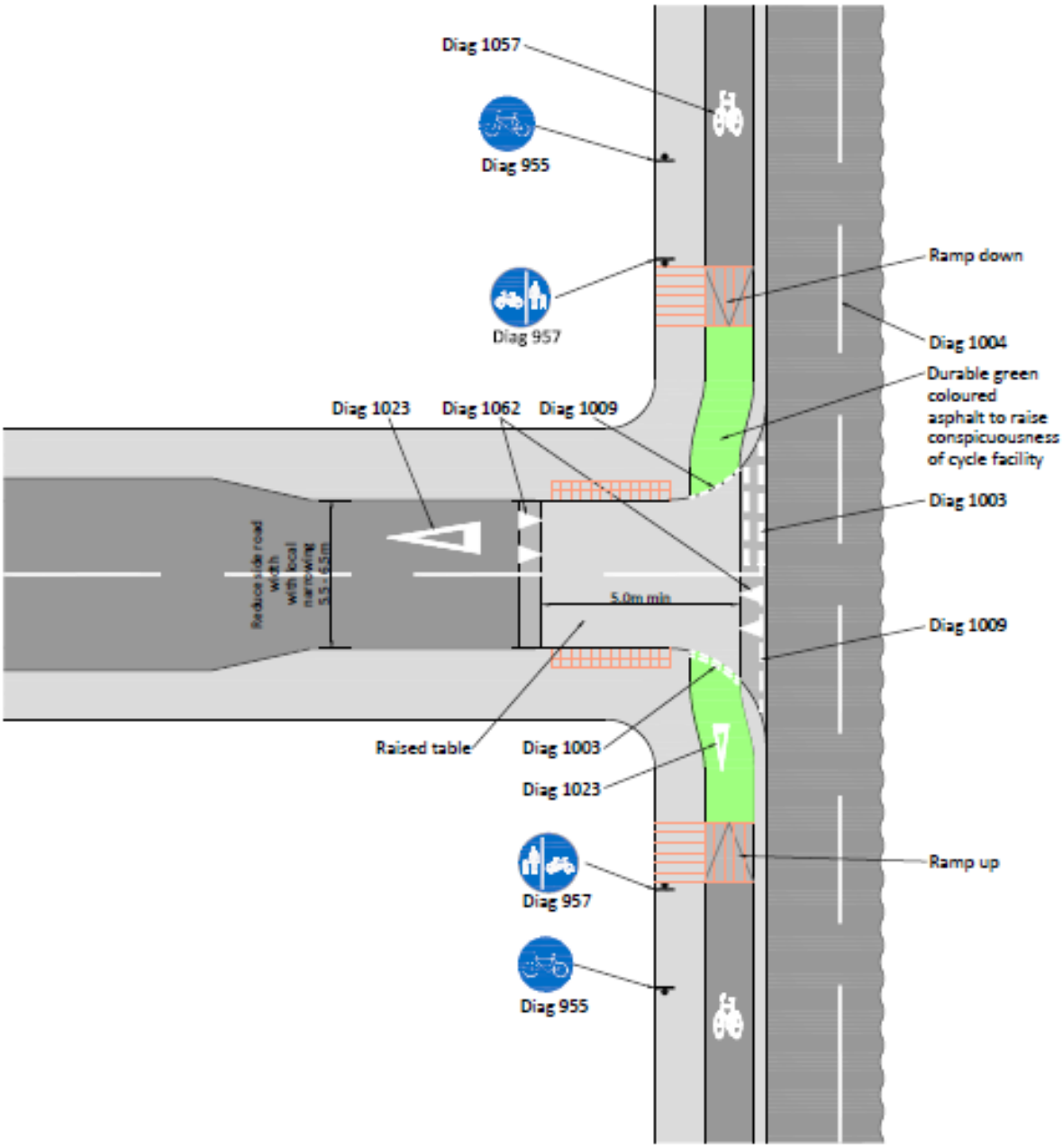
- Cycle Track details shown on L-CT-GE-01.
- Wide cycle lane recommended across the mouth of the side road junction to raise awareness of cyclists presence
- Signs to be positioned at the back of footway making best use of existing street furniture where possible to minimise clutter and obstruction.

Drawing No:	J-CT-GE-01	Rev: A
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:

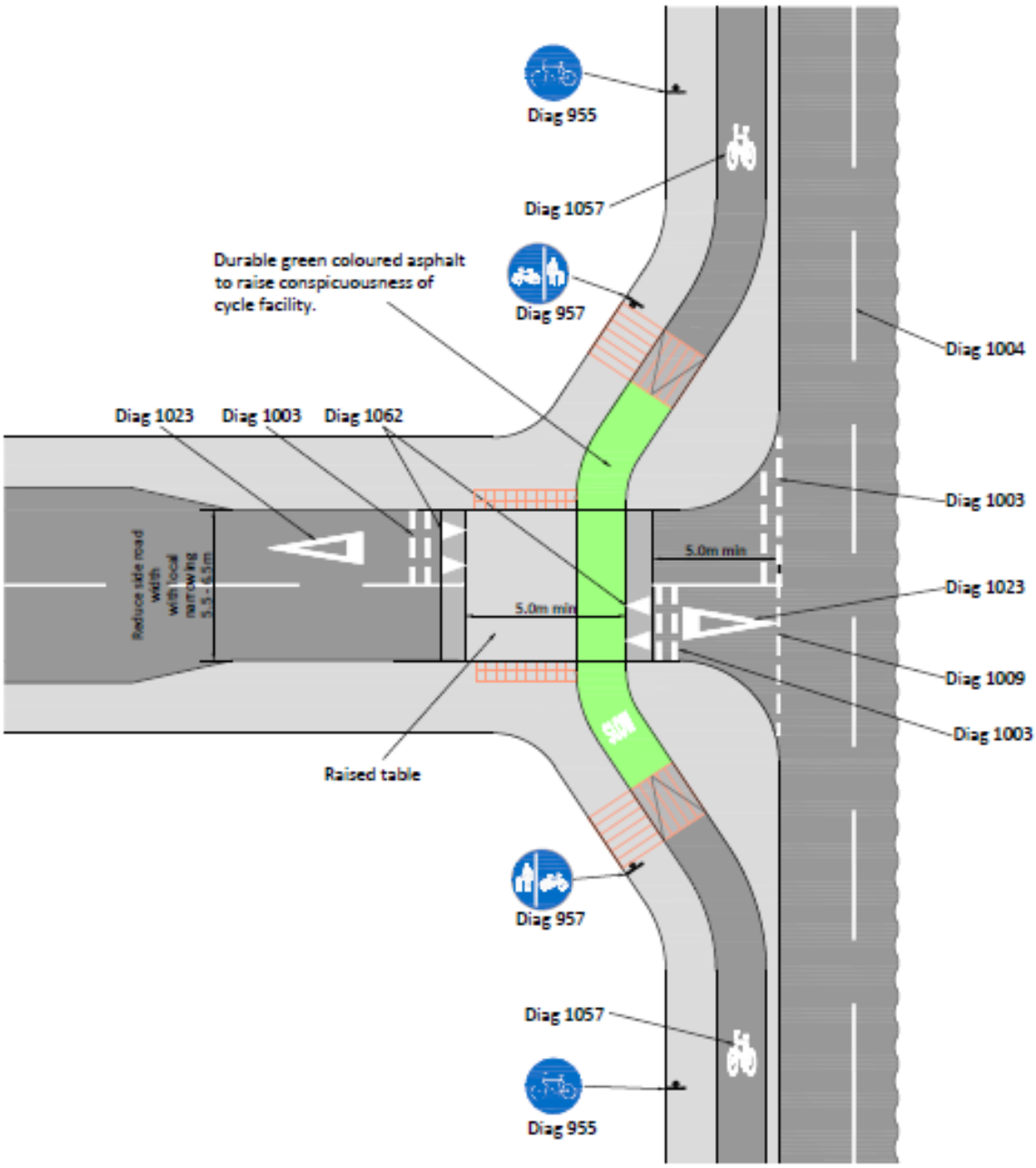
- Cycle Track details shown on L-CT-GE-01.
- Cyclists required to give way to side road general traffic.
- Signs to be positioned at the back of footway making best use of existing street furniture where possible to minimise clutter and obstruction

Drawing No:	J-CT-GE-02	Rev: A
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:

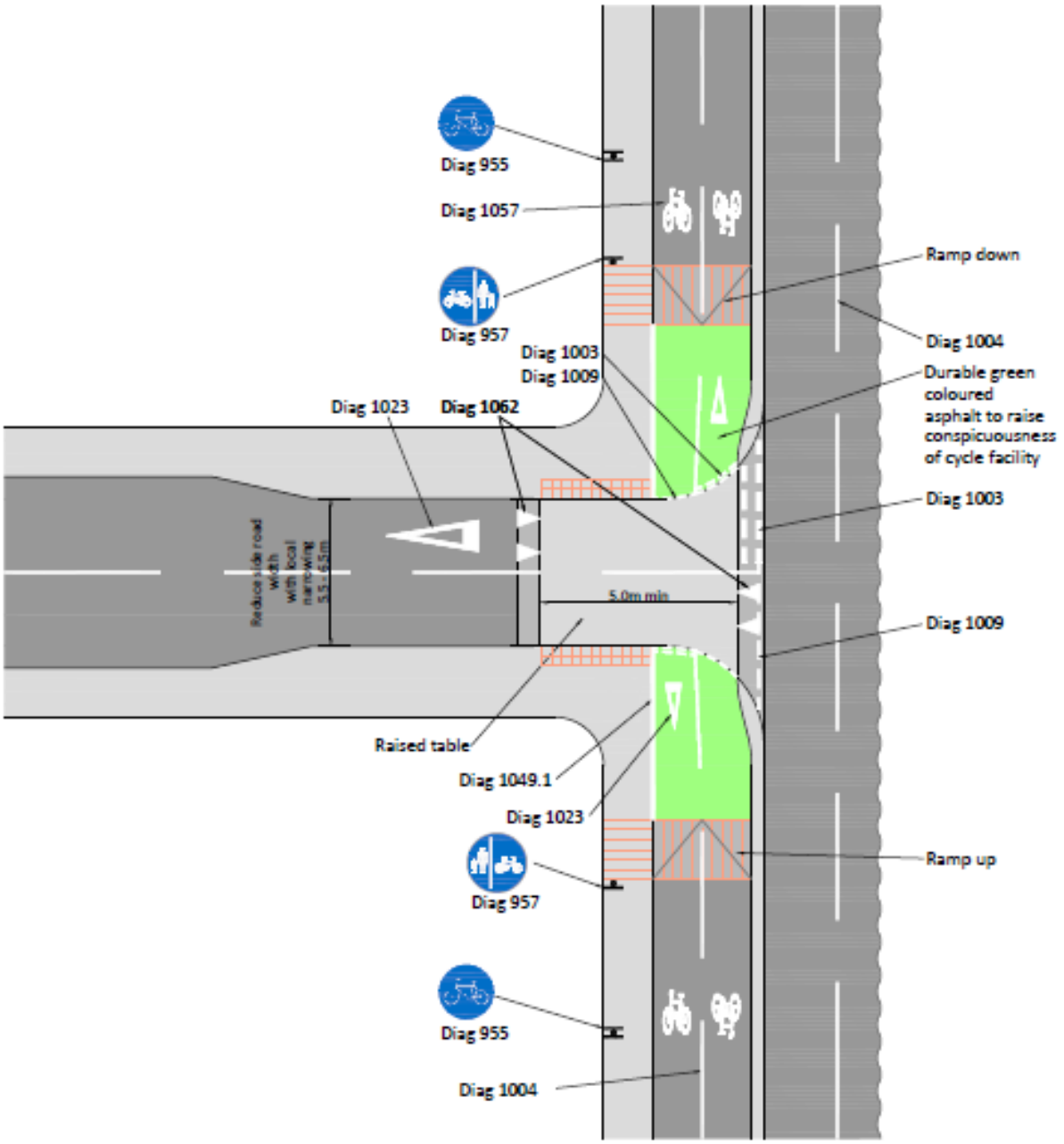
- Cycle Track details shown on L-CT-GE-02.
- Side road traffic gives way to cyclists.
- Requires available land on both corners of the junction.
- Signs to be positioned at the back of footway making best use of existing street furniture where possible to minimise clutter and obstruction.

Drawing No:	J-CT-GE-03	Rev: A
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:

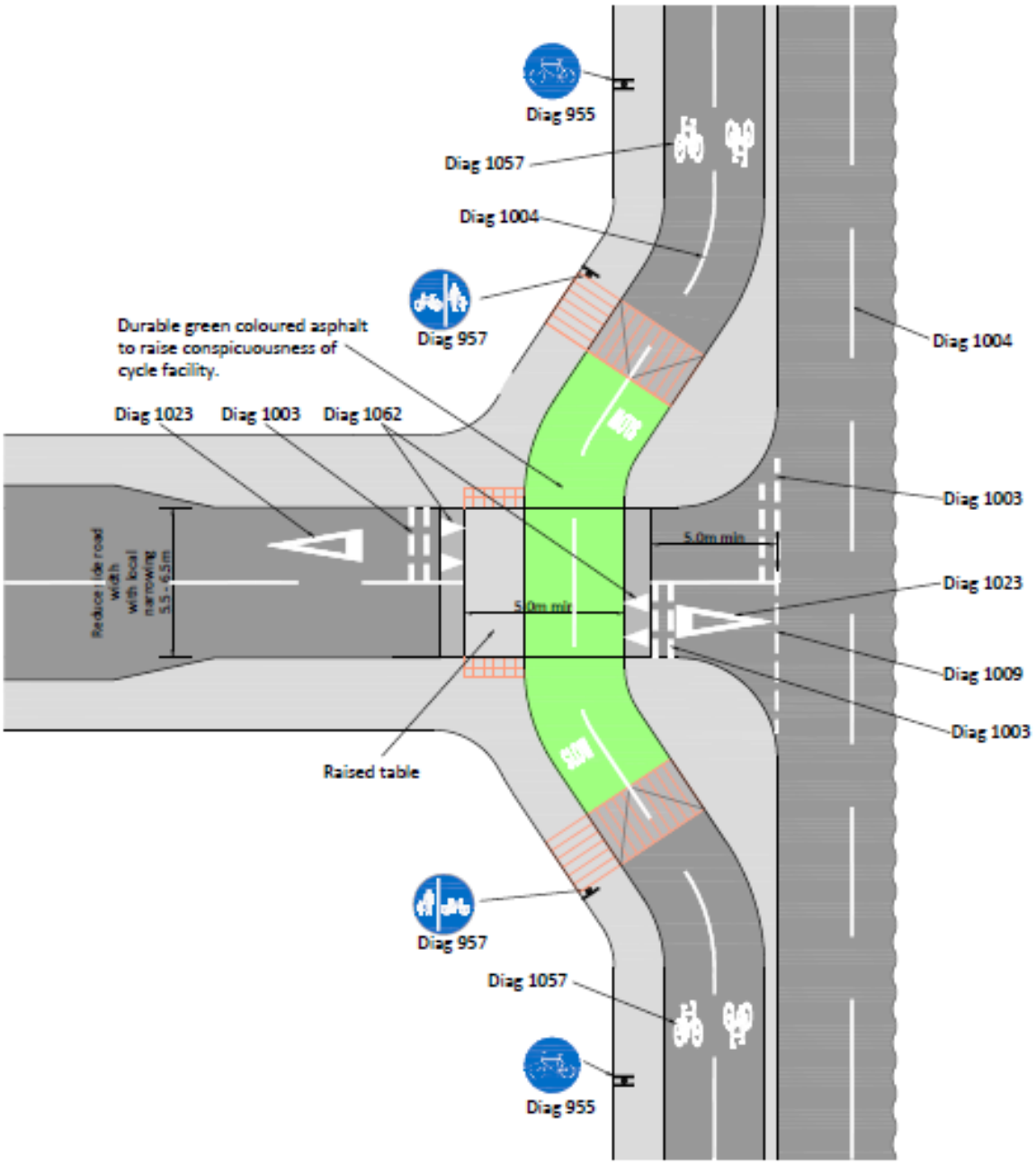
- Cycle Track details shown on L-CT-GE-02.
- Cyclists required to give way to side road general traffic.
- Signs to be positioned at the back of footway making best use of existing street furniture where possible to minimise clutter and obstruction

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:

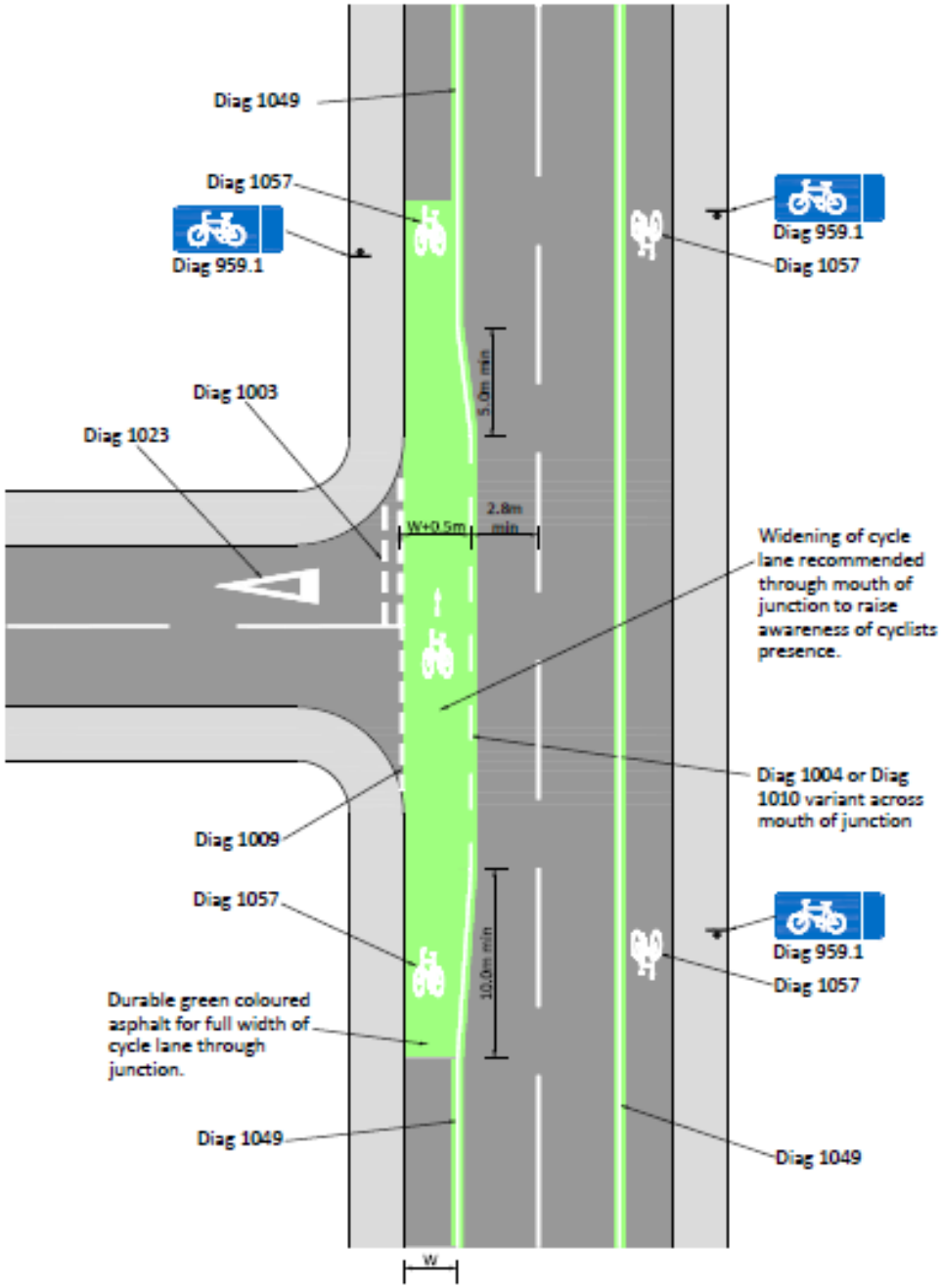
- Cycle Track details shown on L-CT-GE-02.
- Side road traffic gives way to cyclists.
- Requires available land on both corners of the junction.
- Signs to be positioned at the back of footway making best use of existing street furniture where possible to minimise clutter and obstruction.

Drawing No:	J-CT-GE-05	Rev: A
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:

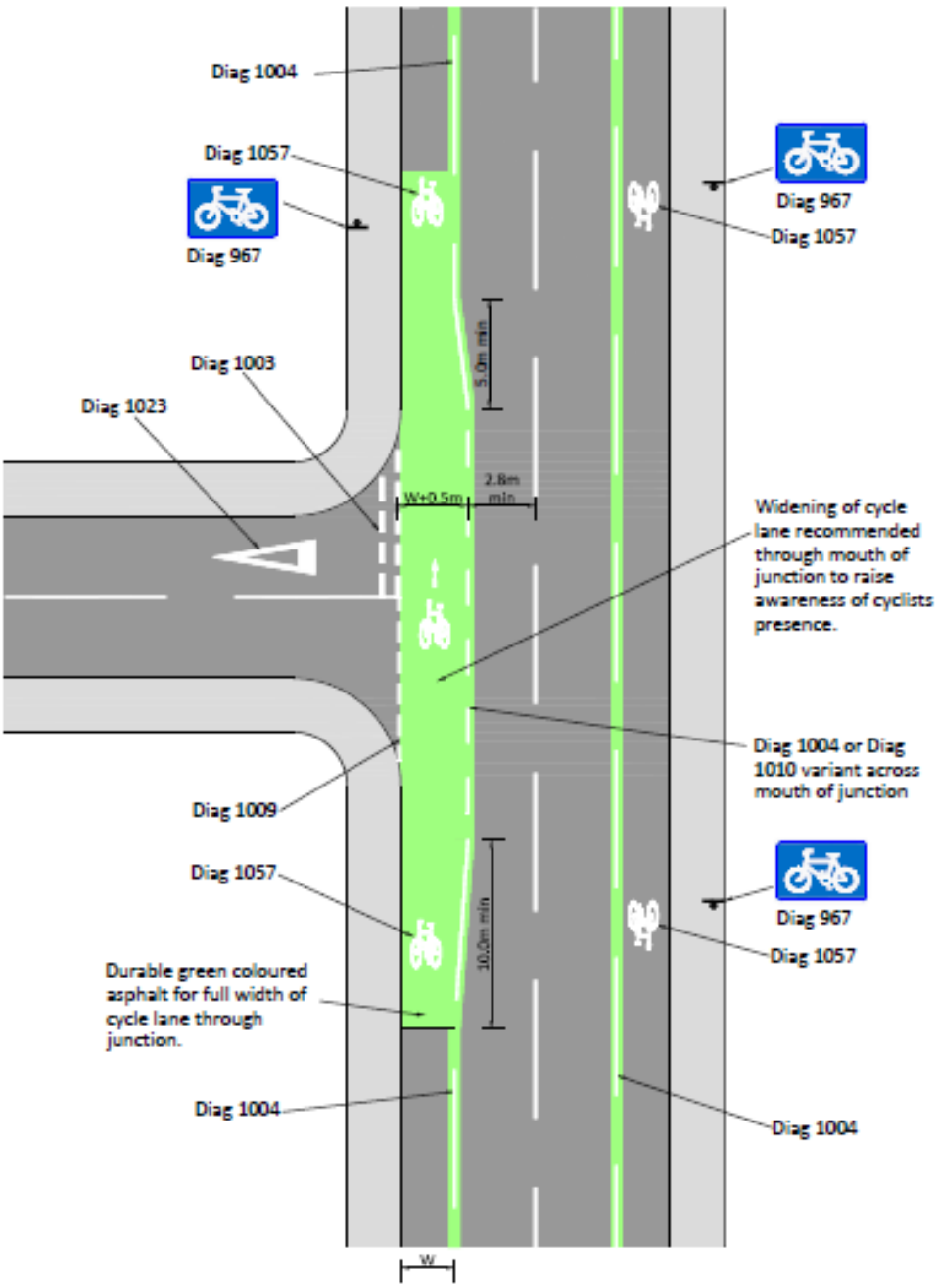
Mandatory Cycle Lane details shown on L-CL-GE-01

Drawing No:	J-CL-GE-01	Rev: A
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:

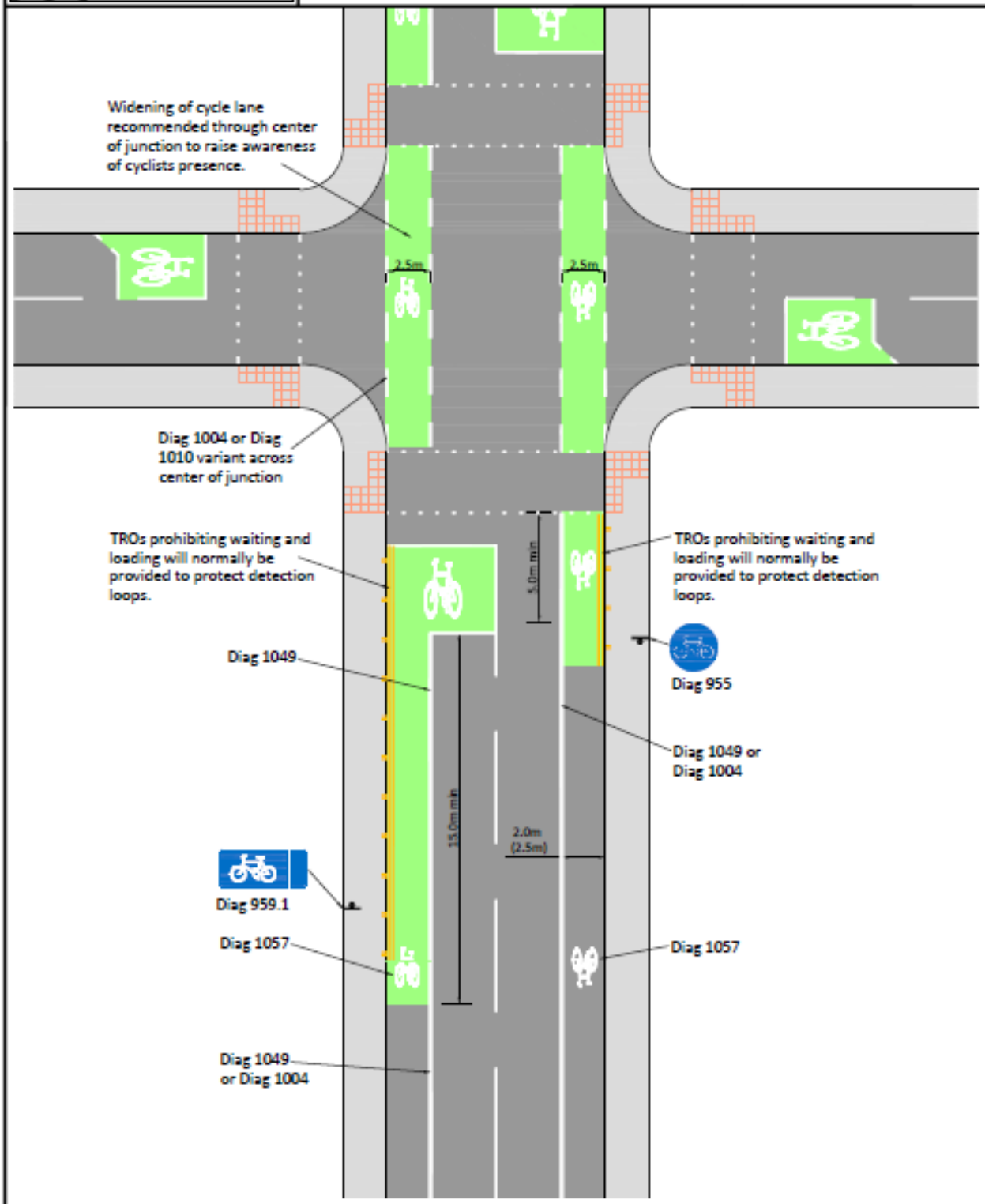
Advisory cycle Lane details shown on L-CL-GE-02

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

Transport for Greater Manchester

Title:

CYCLE LANE TROUGH SIGNAL CONTROLLED JUNCTION



Typical Costs:

Work Zone Length	250m
Lower Cost Estimate	£70,000
Upper Cost Estimate	£190,000

- 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:

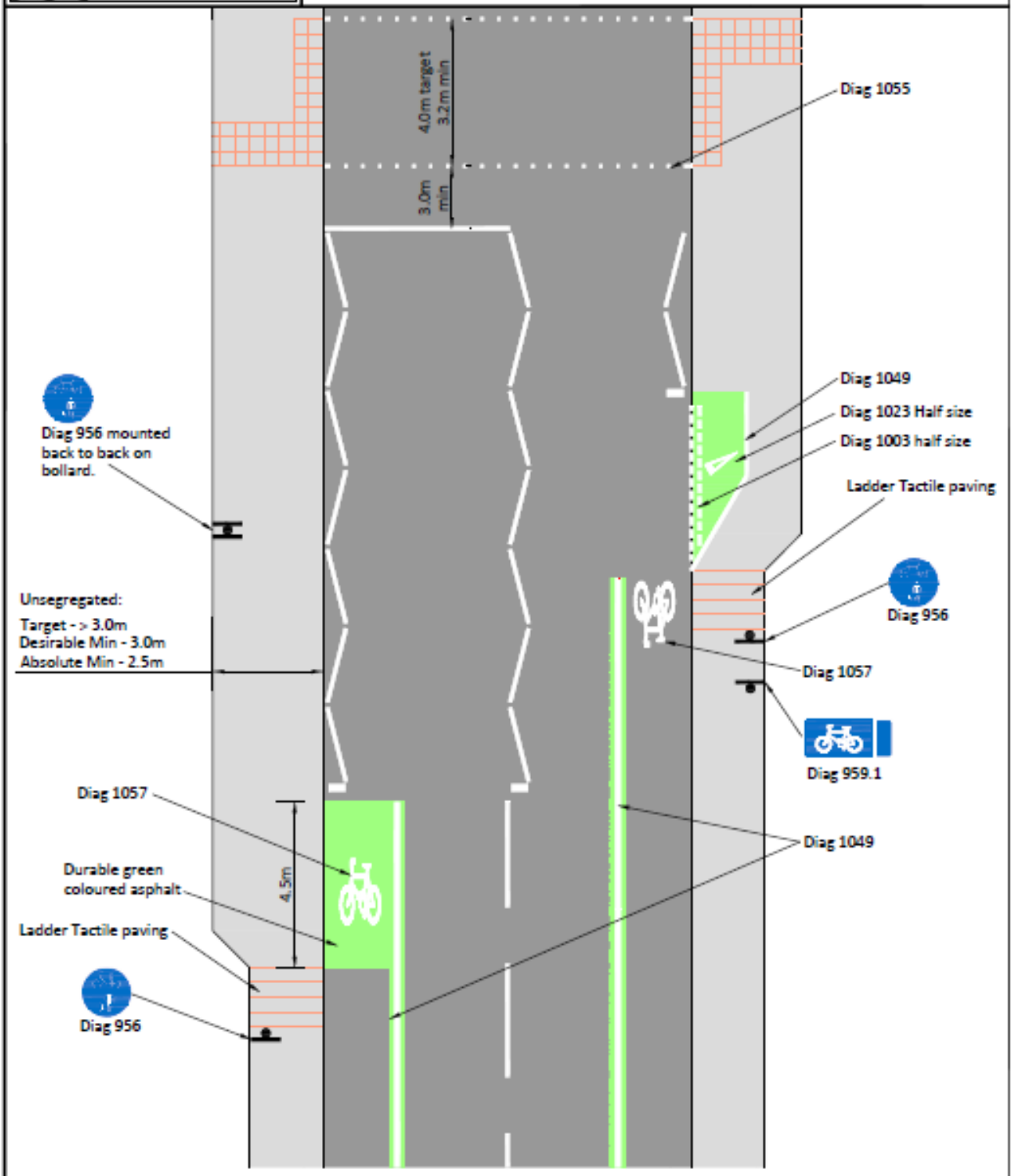
- Applies to Mandatory and Advisory Cycle lanes.
- Cycle lane details shown on L-CL-GE-02 (Mandatory) and L-CL-GE-03 (Advisory)

Drawing No:	J-CL-GE-03	Rev: A
Lead Section:	JUNCTIONS	

Transport for Greater Manchester

Title:

MANDATORY CYCLE LANES 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:

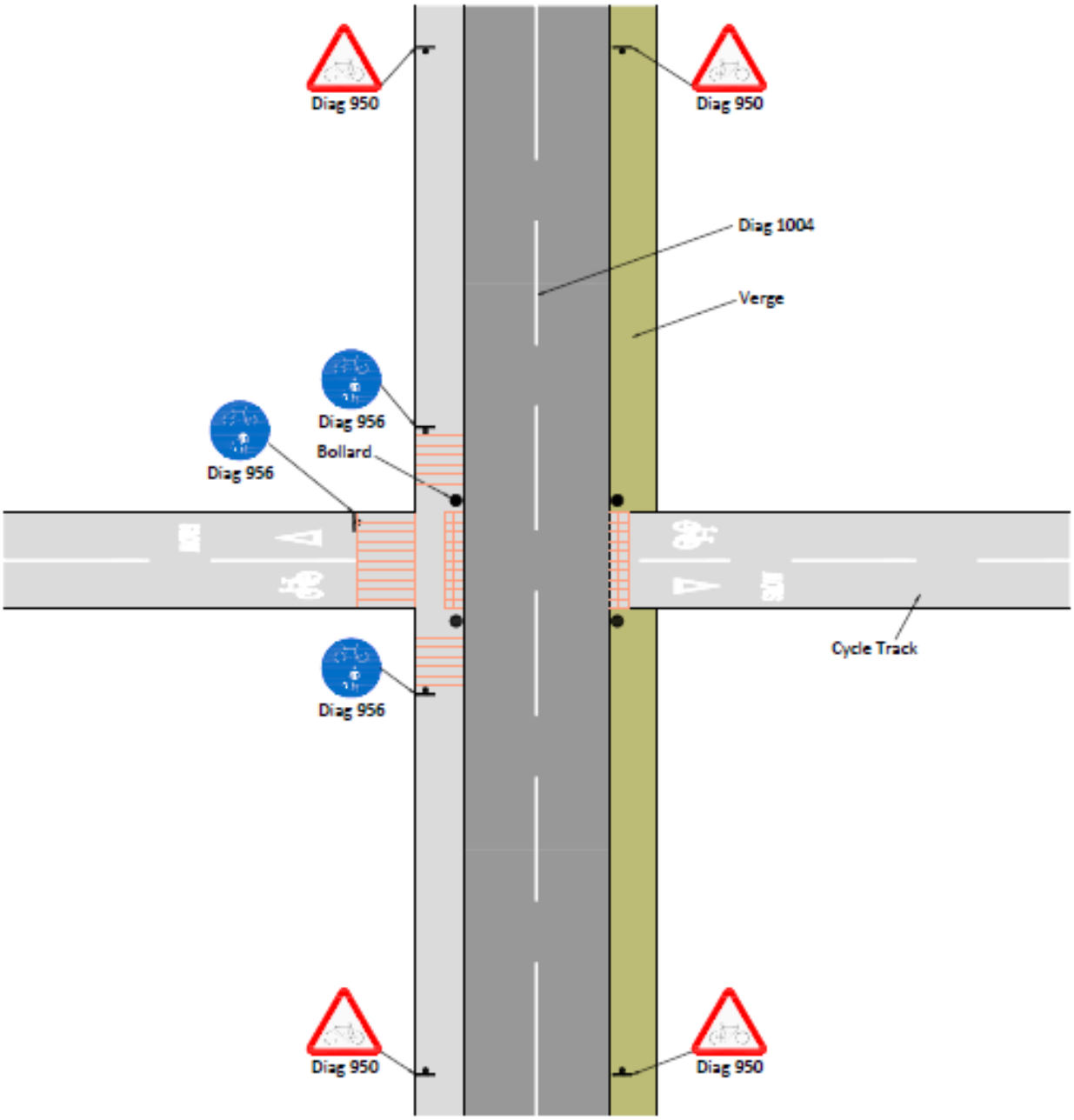
- Applies to Mandatory and Advisory cycle lanes
- Cycle Lane details shown on L-CL-GE-02 (Mandatory) and L-CL-GE-03 (Advisory)

Drawing No:	C-CL-GE-01	Rev: A
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:

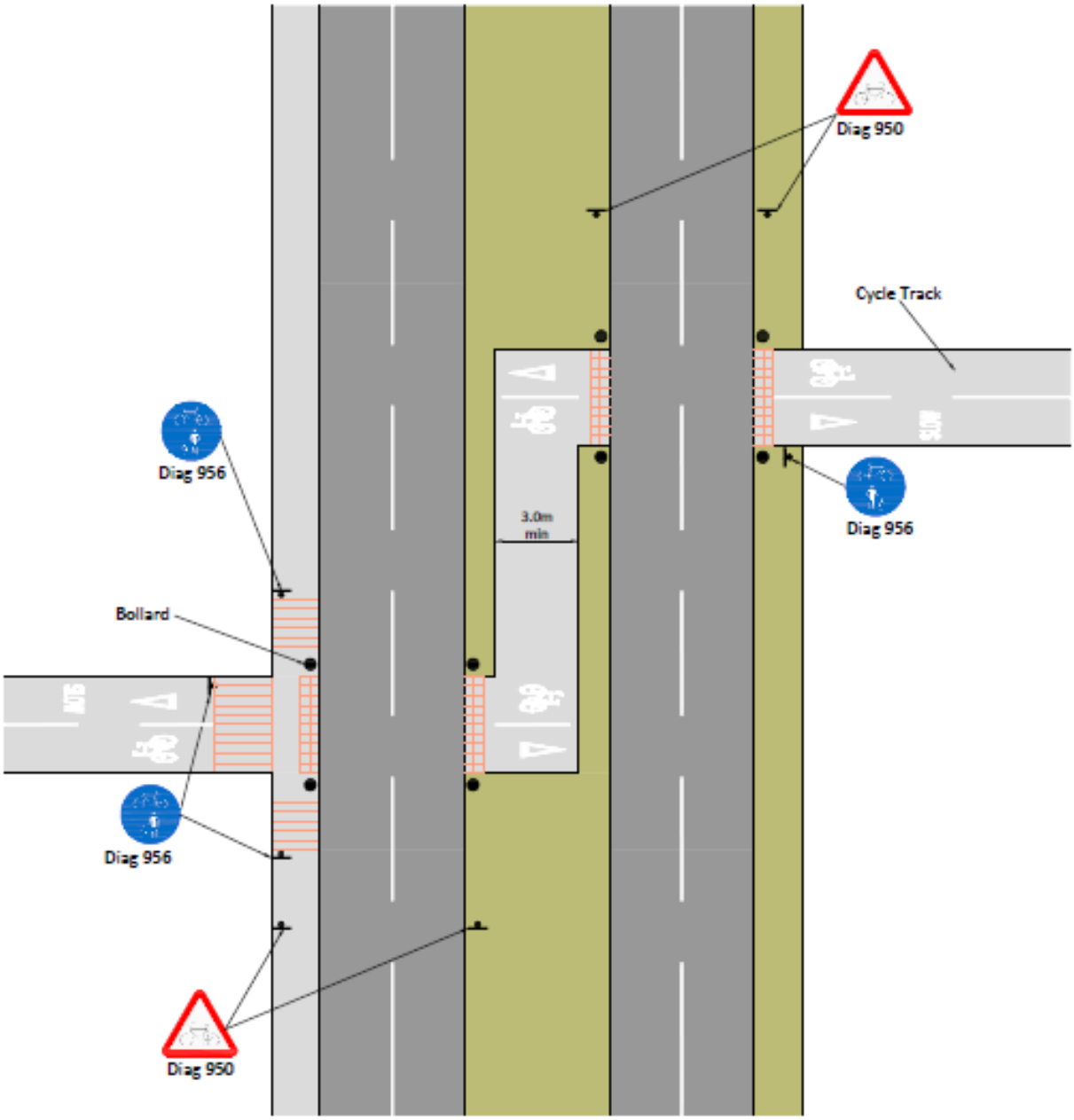
- Layout indicates options for urban areas (with footways) and rural areas (with verges).

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