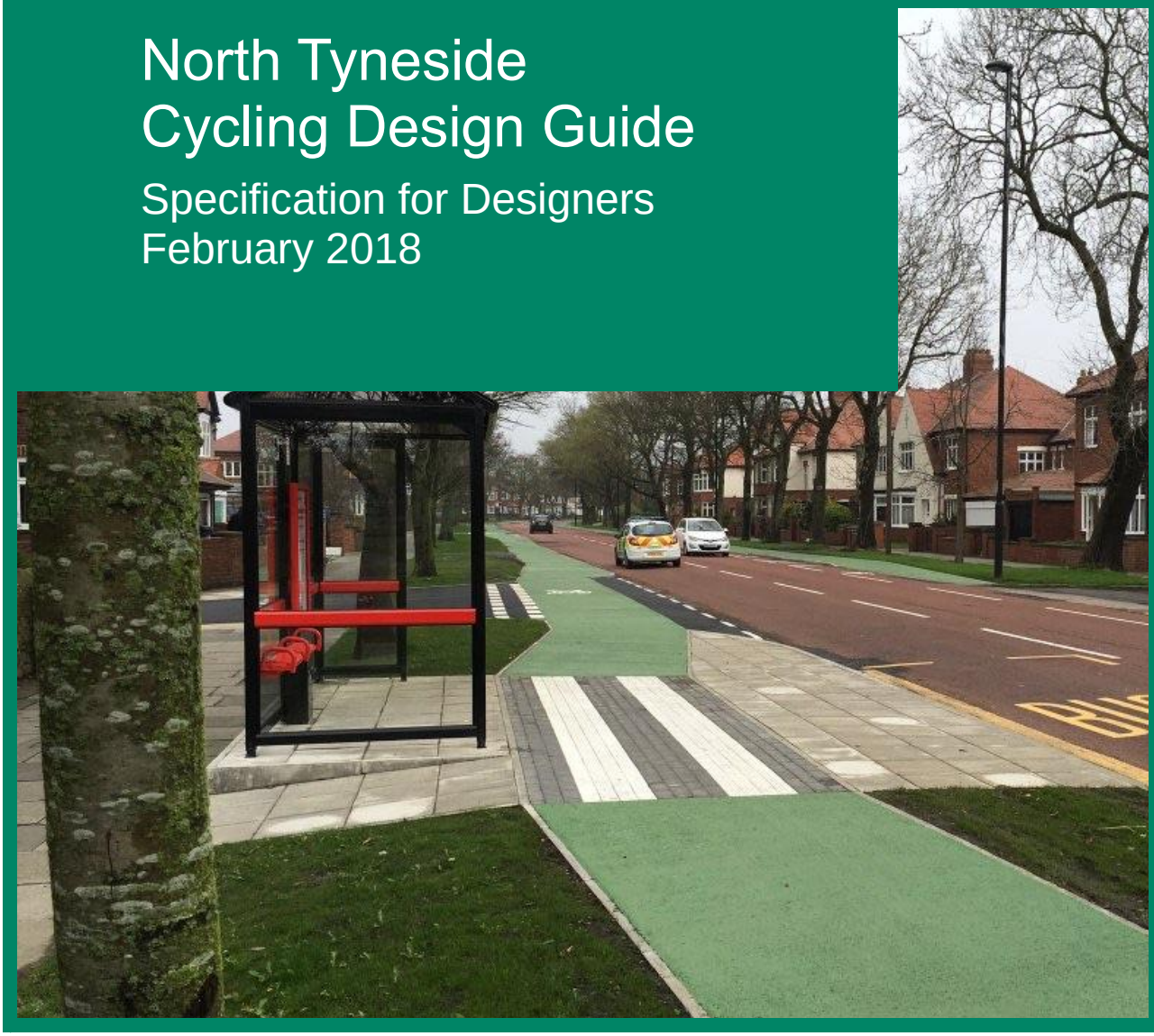
CAPITA

Public

APPENDIX 2

North Tyneside Cycling Design Guide

Specification for Designers
February 2018



We | Listen Create Deliver

Contents

Figures

Tables

Photos

Appendices

1. Introduction

1.1 Intended Audience

This document is intended for use by designers for new developments and designers implementing highway improvement schemes within North Tyneside.

1.2 Overview

This document defines the *minimum* specification for cycle facilities in North Tyneside, as well as potential additional requirements as appropriate by the Developer or the Council.

1.3 Document Aims and Objectives

This document will provide a basis for ensuring that consistent, high quality design and appropriate cycle infrastructure is included for all new developments and highway improvement schemes. Using this design guide should reduce ambiguity and time spent seeking decisions and modifying designs as most scenarios are presented within the document.

2. Background

2.1 NTC Policy

2.1.1 Everyday cycling – enabling people to make everyday trips by bike.

North Tyneside has benefited from a more than 300% growth in cycling over the last decade.

A major element of delivery and growth has involved working in partnership with adjacent authorities, stakeholders, local businesses and developers to create a strategic programme of investment.

The Council Plan, **Our North Tyneside,** states that: "Our places will have an effective transport and physical infrastructure – including our roads, cycleways, pavements, street lighting, drainage and public transport."[1]

The **North Tyneside Transport Strategy** seeks to ensure that *"North Tyneside will have a safe, easy to use, healthy, affordable, accessible and integrated travel and transport infrastructure that works for residents, businesses and visitors effectively and efficiently."*

Our Cycling Strategy forms part of a long-term vision to **make North Tyneside the North East's leading cycling borough by 2032.**

In 2015 the Environment Sub-committee established a Cycling Sub-group with the aim of identifying a strategic policy approach to ensure programmes are in place to influence, enable and encourage a cultural shift that will help make cycling simpler and a natural choice for short trips and for this approach to form the basis of the Cycle Strategy covering 2016 -2020.

The sub-group met with user groups and examined a number of local transport policies including the Tyne and Wear Local Transport Plan (LTP3), the North Tyneside Road Safety Strategy, the Highway Asset Management Plan (HAMP) and the Transport and Highways Supplementary Planning Document (LDD12).

The group subsequently developed 4 key recommendations which were formally adopted by Cabinet:

Recommendation 1: Amend and update LDD12 to more robustly reflect best practice with respect to cycling.

Recommendation 2: Produce an updated Cycle Strategy which includes a strategic network of primary and secondary routes & set targets of increased cycling numbers in North Tyneside.

Recommendation 3: That a corporate approach is taken (including Public Health, Highways, Planning and Tourism) to the promotion of cycling; and that an Annual Information Report on cycling should be provided to Cabinet.

[1] Our North Tyneside Plan

In relation to this document Recommendation 4 stipulated that:

'A design guide is developed that reflects continental best practice and ensures that a corporate approach to maintaining the network is adopted.'

This strategic and corporate approach has presented North Tyneside with an opportunity to build on the sustained and welcome growth in cycling by delivering consistency of provision across the borough and indeed throughout the region.

The guidance will centre on generic layouts designed to achieve high quality cycling infrastructure. As is often the case with retrospective design the challenge is to develop bespoke solutions that gives due consideration to the needs of other road users. In all circumstances we will meet these challenges by continuing to work in partnership with stakeholders, including the North Tyneside Cycling and Walking consultation group.

2.2 Key Contacts

Email: traffic@northtyneside.gov.uk
Tel.: 0191 643 2221

Highways and Transportation
North Tyneside Council
Quadrant East 1st floor left
Cobalt Business Park
The Silverlink North
NE27 0BY

3. Principles of Designing for Cycling

There are a number of principles for cycling that designers must appreciate when providing cycling infrastructure. The principles below, adapted from Making Space for Cycling, which was written by Cambridge Cycling Campaign in 2014, explain the principles in more detail.

1. *People need protected space for cycling*

   Mixing with traffic generally puts people off cycling. Appropriate infrastructure, away from traffic, can make cycling convenient and sociable

Photo 1 - Segregated Cycle Lane in Manchester (Sustrans)

2. *People like simple, direct routes*

   Simple, direct routes helps a cyclist maintain momentum. Direct routes are always shorter and wayfinding is easier.

3. *People prefer cycling away from pedestrians*

   Shared use spaces are rarely a suitable form of cycling infrastructure except where pedestrian flows are very low. Shared spaces are generally considered inconvenient to cyclists as they are slow and can be a poor use of highway space. Shared use routes are also poorly perceived by pedestrians as they can become the vulnerable user in an area they would normally feel safe.

4. *People want to maintain momentum*

   Stop-start cycling is hard work. For this reason, cycle infrastructure provided must allow for continuous movement, wherever possible. Cycle tracks must not give way at every side road and driveway. All cycling infrastructure should avoid tight corners and must aim for a smooth movement.

5. *People want to be visible*

   Cycle infrastructure should be designed to allow people to see each other regardless of what type of vehicle they are using.

6. *People like level surfaces*

   A route with constantly varying heights requires more effort to ride and is less comfortable. Ideally, off road cycle tracks must not change height at driveways and junctions.

Photo 2 - Level surface priority crossing on side roads (Making Space for Cycling)

7. *People want unobstructed routes*

   Street furniture, such as signposts, lamp columns etc. must not be located within the cycle route. These obstructions cause constrictions along the route.

8. *People want to cycle away from parked cars*

   Safely overtaking parked cars can be problematic for cyclists. Car doors, reverse parking and pinch points on the carriageway can all cause problems for cyclists. Car parking off street, or offset from the main carriageway helps to avoid blocking a cycle route.

9. *People need somewhere to park their bike*

   Good quality cycle parking is essential for the start and end of the journey. This means providing secure stands near the entrance to a building, on-streets and at interchanges.

10. *People want well maintained infrastructure*

    Cycle infrastructure must be designed to facilitate easy maintenance, to avoid overgrown vegetation and enable winter treatment.

11. *People want to commute to work*

    The UK has seen an increase in the number of people choosing to cycle to their place of work. In England, around 4% of commuting trips are cycled each year (NTS0409).

4. Proposed Standards

4.1 Overview

This document proposes a set of design standards which are to be applied across North Tyneside Council's network to ensure consistency and a high level of provision for cyclists. A number of documents have been considered (see Appendix A).

We will seek to encourage innovation, in line with the standards set out in this document.

4.2 Cyclist Definition

The provision of any facilities should cater for everyday cycling. The term 'cyclist' in this document refers to any one person who chooses to use a cycle as a mode of transport. This includes children, elderly and inexperienced cyclists, as much as 'commuter' cyclists who tend to be adults who cycle on a regular basis.

4.3 Cyclist Width Requirements

Clear space is essential for cyclists to feel safe when travelling. The space needed for a cyclist to feel safe depends on the cyclist's dynamic envelope, the clearance when passing fixed objects and the distance and speed of other traffic. The topography of the site must be considered when designing cycle infrastructure. For example, when a cyclist is travelling uphill they will sway more than travelling on flat ground. In these instances, the width of the cycling infrastructure must be increased to provide the safe width. The recommended widths are covered in Section 4 of this document.

Widths in this document are specified as effective widths. The effective width refers to the usable width of a cycling facility and can depend on how the facility is bounded. Factors which reduce effective width are generally vertical boundaries such as walls, lamp columns, guardrail etc. TA 90/05 provides guidance on additional widths for bounded sections of Non-Motorised User routes. An additional 0.25m should be provided where a vertical feature is below 1.2m. For vertical features greater than 1.2m, an additional 0.5m should be provided on each side as appropriate.

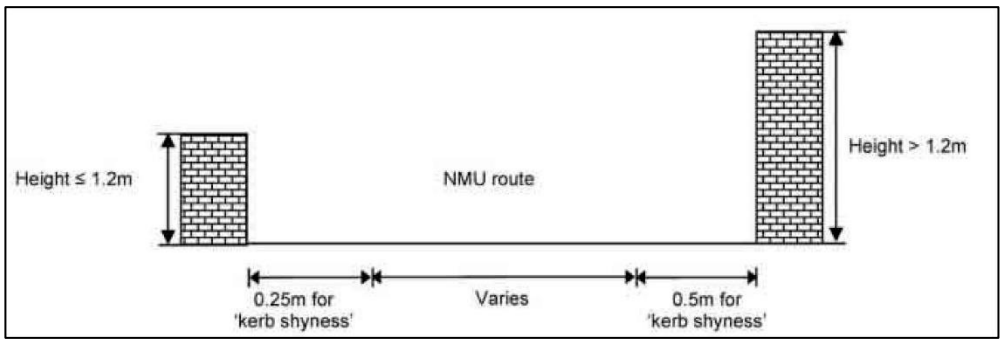


Figure 1 - Additional widths required to maintain effective width (Highways England)

IAN 195/16, the latest Highways England endorsed cycling design guide for trunk roads, advises the standard vehicle for cycle routes should be assumed as 2.8m long and 1.2m wide. These dimensions are made up of a standard cycle at 1.8m plus a child trailer of up to 1.0m in length. The vehicle length will impact the design of cycle infrastructure such as, island widths, turning movements etc.

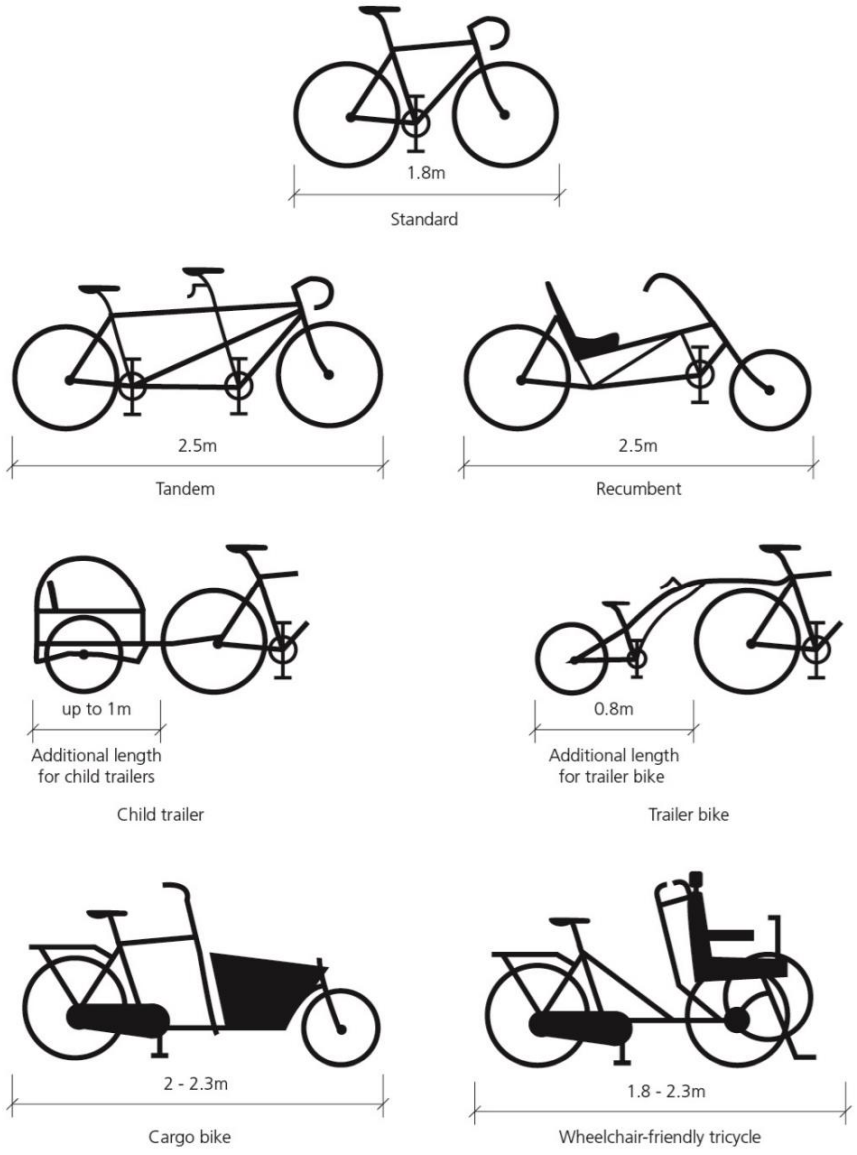


Figure 2 - Approximate Lengths of Different Types of Cycle (IAN 195/16)

The use of e-bikes is a growing form of transport and designers should consider additional measures a cyclist using an e-bike might require. For example, an e-bike can travel at a higher average speed than a conventional pedal cycle and as such horizontal deflection must be minimised.

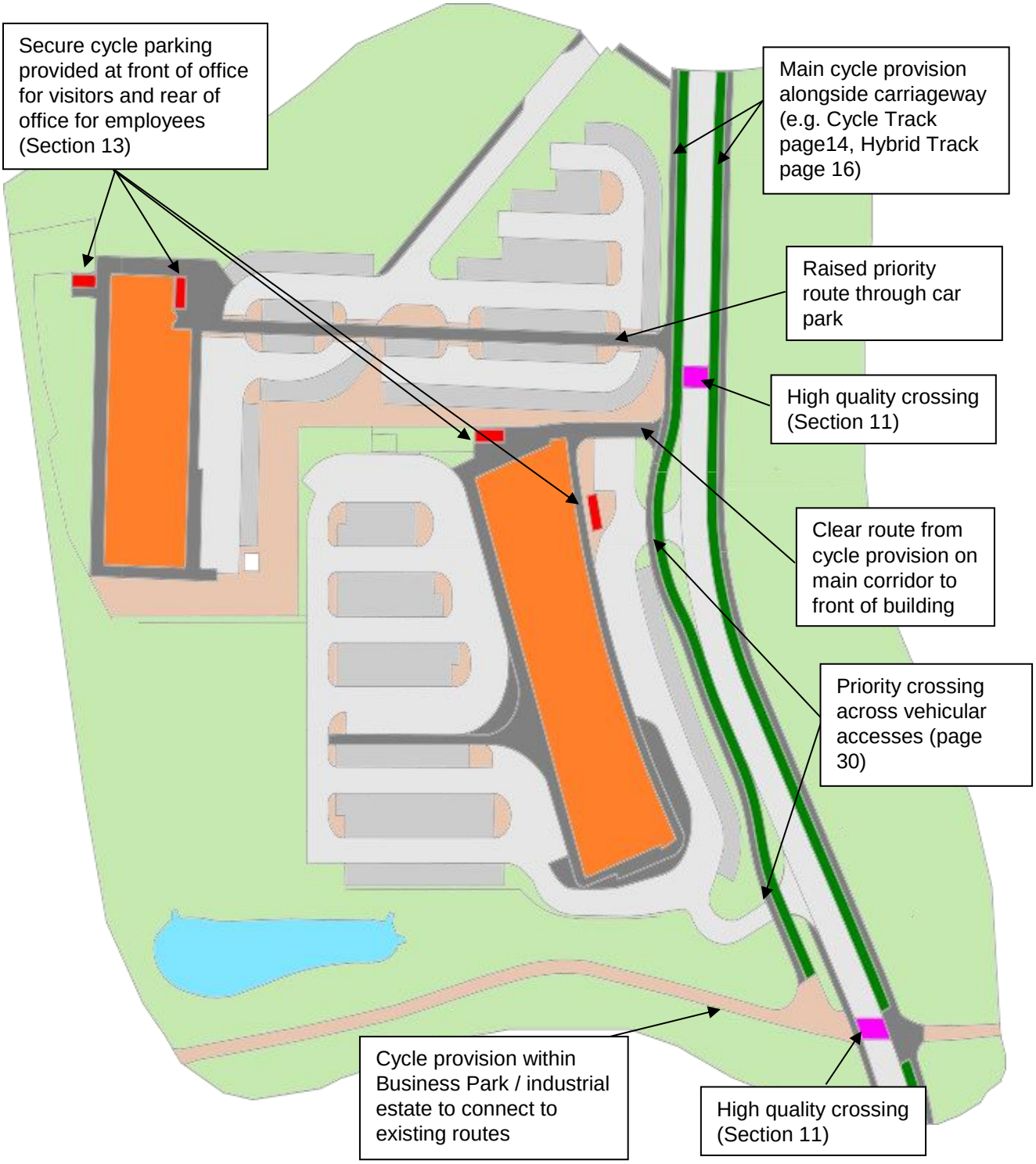
The minimum recommended clearance between a moving motorised vehicle and the outside of the cyclist's dynamic envelope when travelling on the carriageway is 1.0m for vehicles travelling 20mph or less. This distance increases to 1.5m for vehicles travelling between 21 to 30mph (LTN02/08). It is also worth noting that this distance increases when a bus or HGV passes a moving cyclist, as their passing movement will have a greater effect on the cyclist.

Designers must consider the effect passing traffic has on cyclists when providing on carriageway infrastructure and propose appropriate measures in keeping with the highway design. For example, wider cycle provision on bus routes or routes.

Figure 3 - Cyclists Dynamic Envelope (LTN02/08)

5. A Typical Residential Estate Layout

6. A Typical Employment Site Layout



7. Types and Widths of Infrastructure

Table 1 - Required effective widths for cycle infrastructure

	Footway	Cycle Facility	Buffer*	Traffic Lane	Total Width
Cycle Track (on both sides of the road) (page 14)					
Required width	2.0m	2.5m	0.5m	3.25m	16.5m
Minimum width	2.0m	2.0m	0.2m	3.0m	14.4m
Cycle Track (by exception, on one side of the road) (page 15)					
Required width	2.0m	3.5m	0.5m	3.25m	14.5m
Minimum width	2.0m	2.5m	0.2m	3.0m	12.7m
Hybrid cycle track (page 16)					
Required width	2.0m	2.5m	n/a	3.25m	15.5m
Minimum width	2.0m	2.0m	n/a	3.0m	14.0m
Light Segregation (page 17)					
Required width	2.0m	2.0m	0.5m	3.25m	15.5m
Minimum width	2.0m	1.5m	0.2m	3.0m	13.4m
Cycle Lanes (Mandatory or Advisory) (page 18)					
Required width	2.0m	2.0m	n/a	3.25m	14.5m
Minimum width	2.0m	1.5m	n/a	3.0m	13.0m
Shared footway / cycleway (segregated) (page19)					
Required width	2.0m	2.0m	0.5m	3.25m	15.5m
Shared footway / cycleway (unsegregated) (page19)					
Required width	3.5m		0.5m	3.25m	14.5m
Minimum width	2.5m		0.5m	3.0m	12.0m

* The width of buffer zones may be reduced to ensure the cycle infrastructure width is maintained. Cross sections of each type of infrastructure can be found in Appendix D.

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. Such interventions could include (but are not limited to):

- Remove or relocate parking and loading bays
- Inset bus stops
- Make links one-way
- Alter or narrow footway configurations as appropriate
- 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.
-

In retrofit locations it will not always be possible to achieve the minimum widths set out in Table 1 and there will be a necessity to compromise. North Tyneside Council will consider designs on an individual basis where existing constraints restrict the desired widths or prevent types of infrastructure from being installed to the prescribed standards above.

8. Level of Provision

8.1 Cycle Infrastructure on Cycle Routes

North Tyneside Council have identified a number of strategic routes for cyclists in the borough. Appendix B shows the Local Authorities Cycle Route 'Tube Map'. This map illustrates the strategic routes and key destinations throughout North Tyneside. Cycle infrastructure on all routes, whether strategic and local, must be installed to a high quality.

Table 2 shows the level of cycle provision that would be expected on strategic and local cycle routes within North Tyneside. The table considers the speed limit of the carriageway as well as the traffic volumes. This table was developed using IAN195/16, Greater Manchester Design Guidance and the Active Travel (Wales) Act.

Table 2 - Level of Cycle Provision

Speed Limit	Motor traffic flow (average annual daily traffic)	Preferred provision by Cycle Route Type	
		Strategic Cycle Route	Local Cycle Route
40mph and above	All flows	Cycle Track (excluding light segregation and hybrid tracks)	Cycle Track (excluding light segregation and hybrid tracks)
30mph	>10000	Cycle Track or Hybrid Track	Cycle Track or Light Segregation
	0 – 10000	Cycle Track, Hybrid Track or Light Segregation	Hybrid Track, Cycle lanes
20mph	>5000	Cycle Track, Hybrid Track	Hybrid Track, Cycle lanes
	3000 – 5000	Cycle Lanes	Quiet Streets
	<3000	Quiet Streets	Quiet Streets

* In industrial and commercial (use classes B2, B8 and A1) areas, North Tyneside may stipulate the developer provides cycle tracks, regardless of vehicle flows. This stipulation will be included for safety reasons.

8.2 Crossing Facilities

Tables 3 and 4 show the type of crossings North Tyneside Council expect in relation to carriageway speed limits, vehicle and pedestrian / cyclists flows. These tables have been developed using IAN 195/16, Greater Manchester Cycling Design Guide, London Cycling Design Guide and the Active Travel (Wales) Act.

North Tyneside Council will determine if a route is High / Medium / Low flow on an individual development basis. For example; a route on the approach to a primary school will require a higher level of crossing provision than the tables may indicate.

Table 3 - Crossing Types for Strategic Routes

Speed Limit	Flows (24 hour two way flow)			Type of Crossing
	Vehicle Flow (along road)	Expected Cycle Flow (Crossing)	Expected Pedestrian Flow (crossing)	
≥60mph	Any	All Flows	All Flows	Grade separated
50mph	>12,000	High to Medium	High to Medium	Grade separated
	< 12,000	Medium to Low	Medium to Low	Signalised cycle crossing
40mph	>12,000	High	High	Grade separated
	8,000 – 12,000	Medium	Medium	Signalised cycle crossing
	< 8,000	Medium	Medium	Signalised cycle crossing
	< 8,000	Medium - Low	Medium to Low	Central Island – suitable for cycles (on road and crossing)
	< 8,000	Low	Low	Priority – Cycles give way
30mph	> 12,000	High to Medium	High to Medium	Signalised cycle crossing or Parallel crossing
	8,000 – 12,000	High to Medium	High to Medium	Parallel crossing
	< 8,000	Medium	Medium	Parallel crossing – preferably on a raised table
	< 8,000	Low	Low	Central Island – suitable for cycles (on road and crossing)

Table 4 - Crossing Types for Local and Residential Roads

Speed Limit	Flows (24 Hour)			Type of Crossing
	Vehicle Flow (along road)	Expected Cycle Flow (Crossing)	Expected Pedestrian Flow (crossing)	
30mph	< 8,000	High / Medium	High/ Medium	Parallel crossing – preferably on a raised table
	< 8,000	Low	Low	Raised cycle priority
20mph	< 8,000	High / Medium	High / Medium	Raised cycle priority
	< 8,000	Low	Low	Dropped kerb and associated markings

9. Route Infrastructure

9.1 Introduction

This section covers the key design principles for different types of cycle route infrastructure.

9.2 Cycle Tracks

A cycle track is a section of highway adjacent to, but not on the carriageway, that has been dedicated for use by cyclists. Key design features of a cycle track include;

- Suitable effective width
- Smooth horizontal alignment
- Raised priority junctions (see section 11)

Cycle tracks are the preferred facility for key cycle links in North Tyneside. The reason for this is they provide a safe route for cyclists of all abilities and confidence levels. They also allow for continuous movement with minimal stop/starting procedures for cyclists.

In accordance with best practice, it is recommended that a 2.5m width is designed for a cycle track to allow enough space for overtaking manoeuvres within the confines of the cycle track.

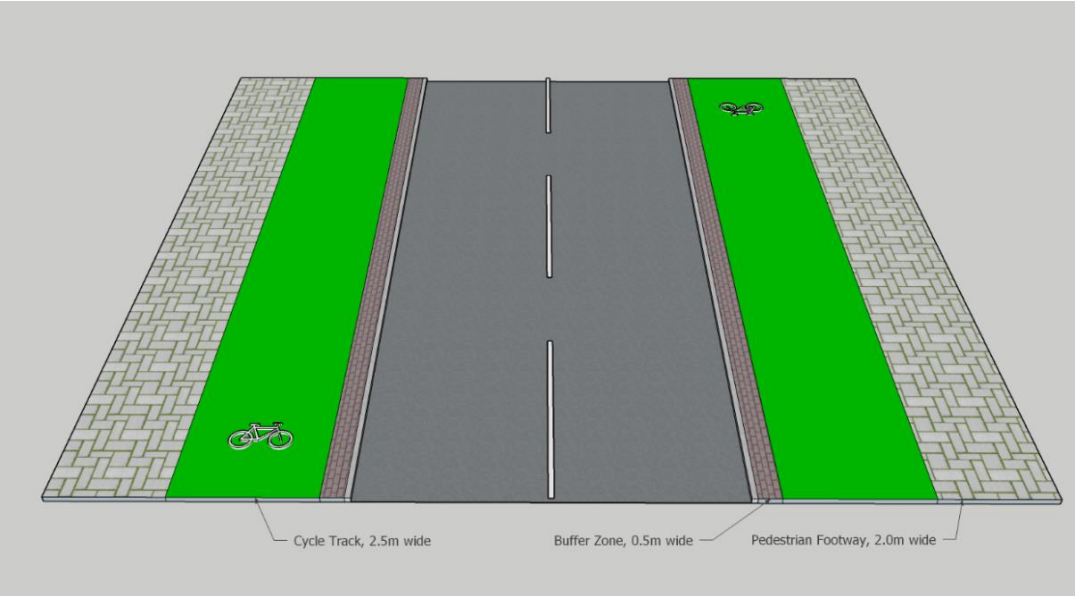


Figure 4 - Cycle Track detail, on both sides of the road

Cycle tracks should generally be provided on both sides of the road, this will prevent the need for the provision of suitable crossing point at numerous locations along the route. Figure 4 shows a typical example of a cycle track on both sides of the carriageway.

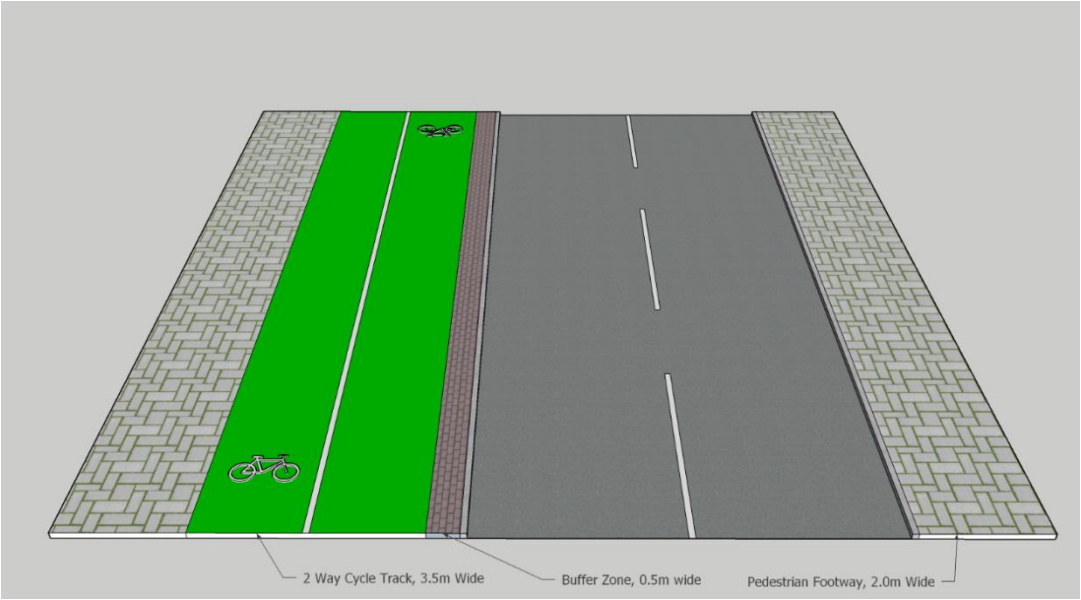


Figure 5 - Cycle Track detail, on one side of the road

Cycle tracks on one side of a road can be considered as an appropriate measure in some locations. For example, where a large number of side streets or high levels of pedestrian activity is present on one side of the road. However, there are design issues which should be considered, such as crossing facilities, where trip generators are located on both sides of the road. Figure 5 shows a typical detail of a cycle track on one side of the road. Photo 3 shows an example of a cycle track alongside a major road (Beach Road in Tynemouth).

Photo 3 – Footway and Cycle Track on Beach Road, Tynemouth, clearly distinguished by surface treatment

Segregation between pedestrians and cyclists on cycle tracks can be achieved using a number of different methods. Several guidance documents suggest segregation by level difference often offers improved conformity between pedestrians and cyclists. However, it is not always possible due to level constraints. North Tyneside Council will consider the segregation on an individual basis and work with the appropriate bodies to agree on the level of segregation.

9.3 Hybrid Cycle Tracks

North Tyneside Council's preference for medium-flow cycle routes is hybrid cycle tracks. These consist of a terraced approach from the cycle track to the carriageway, and can also be referred to as stepped cycle tracks. Key design features of this form of cycle infrastructure include:

- Vertical separation from the footway and main carriageway to provide greater protection than a cycle lane
- Cycle priority at side roads and vehicle accesses (see section 11)
- Bus stop bypasses on bus routes (page 20)

A hybrid cycle track can also be at a same level to the footway, if there is a suitable buffer between the hybrid cycle track and footway. There is no particular requirement to sign hybrid cycle tracks as they are intended to be easy to interpret for all road users.

Photo 4 - Example of Hybrid Cycle Track in Cambridge (LTN 01/12)

Parking demands should be considered when implementing a hybrid cycle track. Due to lower levels of the cycle track motorists can often use it as a parking area. Therefore, appropriate restrictions or raised buffer zones should be provided to prevent parking and protect cyclists.

9.4 Light Segregation

Where on-carriageway routes have been identified as the preferred solution, designers are expected to consider options which create a 'buffer' between the cycle lane and general traffic lane in order to provide better separation. The types of light segregation can include;

- Wands,
- Armadillos,
- Orcas,
- Hatch / chevon markings

Photo 5 - Example of light segregation using armadillos (Royal College Street, London) – note inclusion of car door zone

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.

Early discussions with North Tyneside Council are recommended as, owing to the many forms which light segregation can take, it is at the discretion of the Council whether to approve the design.

9.5 Cycle Lanes

Cycle lanes can be either mandatory or advisory. Mandatory cycle lanes exclude other traffic from using them at all times. Advisory cycle lanes signify an area of carriageway that other vehicles should not enter unless it is safe to do so.

Cycle lanes should be considered only for carriageways where motorised traffic volumes and traffic speeds are low (see Table 2 – Level of cycle provision).

Photo 7 - Example of advisory cycle lane in Cambridge, these are represented by a dashed line

Photos 6 and 7 show examples of advisory and mandatory cycle lanes. In Photo 7, the advisory cycle lanes are used as a traffic calming feature because the visually narrow the width of the road.

Appendix C shows the markings and signs that would be expected on cycle routes.

Photo 6 - Example of mandatory cycle lane in Central London, these are represented by a continuous line that should not be crossed

9.6 Shared Routes

Although they are recognised as an option for cycle provision, the Council will only approve shared use routes in certain circumstances as they are considered last in the hierarchy of cycle infrastructure. Circumstances might include;

- Short sections where a more direct link may be utilised,
- Crossing point connector paths,
- Physical constraints both on and off the road, and
- Low pedestrian usage.

If the Council agree to the provision of shared use routes they must meet the width requirements set out in Section 7.

Photo 8 - Example of shared use route on Beach Road, North Tyneside

9.7 Bus Stop Bypass

Bus stops will often appear on strategic routes where the provision of cycle tracks are regarded as necessary. At these locations a bus stop bypass must be provided.

A bus stop bypass takes a cycle lane which is usually adjacent to a kerb on the approach to a bus stop, and routes it behind the bus stop; removing the need for cyclists to pass a stopped bus on the main carriageway. After the bus stop the bypass either continues on to a cycle track or merges cyclists back into to the main carriageway.

It is also possible to route cycle track between the bus boarder and the shelter. This is often done to create a smoother route alignment or where site constraints make it difficult to place the bust shelter within the boarder. In these instances, it is recommended that an area for pedestrians crossing the track is clearly defined. This could be achieved through the use of paving.

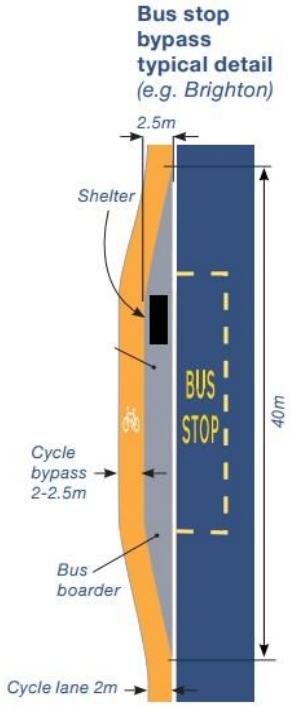


Figure 6 - Bus Stop Bypass Detail from Sustrans Design Manual

Photo 9 - Example of Bus Stop Bypass in Manchester

9.8 Transitions

An extended dropped crossing should be provided at locations where an on-road facility transitions to an off-road facility. It would be expected that the dropped crossing is installed flush with the carriageway, or with a 6mm check at locations where ponding is likely to occur. Road gullies must not be located within the extents of a dropped crossing. At locations where the transition is near or on an approach to a pedestrian crossing point a separate dropped crossing must be provided.

Photo 10 - Example of Transition Kerb in advance of a parallel crossing on Silver Fox Way, North Tyneside

Cyclists must also be protected when transitioning from an off-road cycle route into an on road cycle route. This form of protection can be achieved via the use of suitable transition kerbs and markings.

10. Local / Residential Streets

10.1 Introduction

The majority of streets within North Tyneside are local or residential streets where people live, shop or enjoy themselves. The principles for design in these streets are in accordance with Manual for Streets 2.

10.2 Street Design

Street design is key to making cyclists feel comfortable on roads with no cycle specific infrastructure. Speed reducing measures are a major contributory factor to help achieve the feeling of comfort. Lower vehicle speeds are known to reduce the likelihood of an accident but will also reduce the severity of an accident, should one occur.

Developers would be expected to design their new developments to conform to a 20mph speed limit. The speed limit must be self-enforcing through its design or via the implementation of speed reduction measures. Carefully designed horizontal alignment is the preferred form of self-enforcement. This can be achieved by avoiding long straight sections of carriageway which encourages higher motor speeds.

Specific information on speed reducing measures can be found in Local Transport Note 1/07 and in the Department for Transport's Traffic Advisory Leaflets on traffic calming. When investigating the use of appropriate traffic calming measures it is important that designers consider cyclists and take particular care so that they are not disadvantaged by their use. Further information on traffic calming design is covered in this section.

10.3 Home Zones and Quiet Streets

A home zone will generally include a combination of the following features:

- gateway features
- a level surface
- indirect routes for traffic
- junction priorities removed
- areas of planting
- seats or play equipment
- appropriate signage

Photo 11 - Example of a Home Zone in North Shields

Quiet Streets are residential streets that give priority to people over vehicles. Quiet streets are based on a change in the way that people perceive the street. Motorists should feel that they have left the normal highway and entered an area where they can expect to find people who are using the whole the street. It is the only form of street where no dedicated cycle infrastructure may be acceptable.

Quiet streets have similar design principles to Home Zones where the whole space is the same level and vehicular routes are highlighted through a contrast in materials. Gateways should be provided on all entrances to home zones and quiet streets. This can be achieved by the use of signs and road narrowing. Planters are a common feature used at gateway entrances as they both narrow the carriageway whilst providing the change in street scape required home zones and quiet streets to work.

Photo 12 - Home Zone Gateway with Planters in Bristol

Home zones and quiet streets would be expected within large new developments, so that they are permeable and accessible to pedestrians, cyclists and local traffic.

Photo 11 shows a good example of a home zone installed in North Tyneside.

10.4 Filtered Permeability

Where home zones and quiet streets are not feasible, filtered permeability must be considered as it provides an advantage to cycling and walking by exempting them from access restrictions applied to motorised traffic; or through the creation of short connections only available to cyclists and pedestrians.

Filtered permeability is often created by imposing traffic orders such as;

- Road closures
- Point closures
- Link paths
- Banned turns
- One way streets

An exemption to cyclists would be expected for all of the above traffic orders.

Photo 13 - Example of road closure with exemption for cyclists

Photo 13 shows a good example of a road closure for motor vehicles. The closure of the road at mid link still allows for cyclists to use the route but prevents motorists from cutting though a side street. Although not present in Photo 13, parking restrictions on the approach to the point closure help keep the area clear from parked cars, allowing cyclists to easily manoeuvre the closure whilst promoting route continuity.

Where home zones, quiet streets or a continuous cycle track though a development has not been provided, link paths would be expected at the end of cul-de-sac's in order to connect residential streets and provide a continuous link through the development for pedestrians and cyclists.

Figure 7 shows the typical detail for a link path connecting streets. The local authorities preferred connection would be a segregated cycle track with a level difference between the cyclists and pedestrians.

However, at a minimum, it is recommended that the path is 3m wide for shared use with a 1m grass strip between the path and each boundary fence. This will create a feeling of safety for users of the path. The provision of street lighting will further enhance the link.

Photo 14 – Internal link within housing development

Figure 7 - Typical detail for 5m wide link path between streets

Entry treatments are another feature which would be expected to be considered within the design of new developments. Entry treatments should encourage slow speeds in the area via the installation of tighter radii or raised tables. These items are covered in more detail in Section 11 of this document.

10.5 Traffic Calming

Physical traffic calming measures can sometimes cause a problem for cyclists. Generally, road humps tend to reduce cyclist comfort whereas buildouts and chicanes are more likely to introduce cycling hazards such as, directing cyclists into the path of motor vehicles.

Cycling should always be considered when traffic calming is being installed within a development. North Tyneside Council expect cycle bypasses to be installed at locations where traffic calming is necessary. LTN 2/08 advises that cycle bypasses, should be at least 1.2m wide without any sudden changes in direction. The entry and exit of the bypass should be free from parked cars. Where vehicle parking prevents access, consideration must be given to install physical measures or waiting restrictions in order to prevent obstruction. Cycle bypasses on horizontal features can also be raised to the same level as the footway using a gentle gradient at each end. Photo 15 below shows a good example of a cycle bypass at a road hump.

Where cycle bypasses cannot be installed due to existing constraints, a gap of 1m will be provided between the edge of the road hump / speed cushion and kerb. This distance may be reduced to 750mm as an absolute minimum when installing speed cushions in areas where standard distances are difficult to achieve. It is essential that traffic calming is not placed alongside existing drainage such as gullys as they can be hazardous to cyclists.

Photo 15 - Good example of cycle bypass at buildout for traffic calming

North Tyneside Council will also consider the installation of sinusoidal road humps within residential areas. Sinusoidal road humps are similar to round top humps but have a shallower initial rise. They provide a more comfortable ride for cyclists. Sinusoidal road humps would be expected at locations where cycle bypasses have not been provided. The height of the hump (H) should be 75mm and the length (T) should be 3700mm.

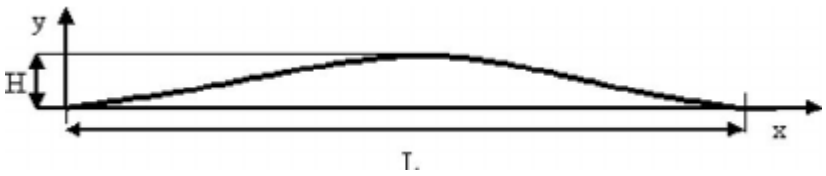


Figure 8 - Cross Section of Sinusoidal Road Hump

10.6 Car Parking

Inconsiderate car parking on cycle routes can cause issues for cyclists. Therefore it is essential that developers consider ways to prevent parking from obstructing a cycle route. These measures can include, but are not limited to;

- Waiting restrictions
- 'Double kerbs' – installing a second kerb behind the carriageway kerb to prevent vehicles 'bumping up'
- Bollards, guardrail etc.
- Cycle track orders

When improving cycling infrastructure on a route which has on-street car parking, the design should place car parking directly adjacent to general traffic lanes, with the cycle route segregated, e.g. adjacent to the footway, and outside of the car 'door zone'.

Photo 16 - Example of segregated cycle lane with 'floating' parking bays

10.6.1 Innovation - Centre Line Removal

Consideration should be given to the removal of centrelines as an option where carriageway widths do not permit the introduction of cycle lanes of adequate width (min 1.5m) whilst retaining two general traffic lanes.

In addition to increasing the width available for cyclists, the technique also has a speed reducing effect. This is because, to a certain extent, the layout operates like a single-track road with passing places. Where the need arises for on-coming motor vehicles to pass each other, this is achieved by both vehicles momentarily pulling over into their respective near-side cycle lanes, having first checked to see they are clear of cyclists.

This technique is only suitable for roads wide enough to accommodate two 1.5m cycle lanes and a central 3.5 m general traffic lane (6.5m). There should be no significant heavy goods vehicle traffic, and general traffic flows need to be low enough to permit single-lane working. If the road widths exceed 6.5m, the additional space should be used to increase the width of the cycle lanes or introduce a buffer strip between the cycle lanes and any on-street parking bays

11. Junctions and Crossings

11.1 Introduction

Junctions are the most common location for road traffic collisions, particularly for cycling related collisions. LTN 02/08 states that 70% of injury accidents involving cyclists take place at junctions. A well designed junction can reduce the number of decisions to be made by each road user. Providing space for cycling and minimising conflict points can prevent collision blackspots.

11.1.1 Priority Junctions

There are a variety of types of priority junctions such as T-junctions and cross roads where cyclists will be required to cross as part of their route. The key objective at these locations is to control traffic movements and speed. It would be expected that cyclists have priority over vehicles at junctions and vehicle accesses along a route. Key items to consider in making side roads more understandable for motorists and cyclists are covered below.

11.1.2 Visibility

Visibility is a key factor which should be considered when designing all types of junction. Visibility splays are defined by their X and Y distances, Figure 9, taken from LTN02/08 shows the basic layout.

Manual for Streets recommends an X distance of 2.4m, which allows one car at a time to check along the main alignment before exiting the minor arm. On cycle tracks a longer X distance is preferred as they reduce the effort and may enhance safety. The desirable minimum 'x' distance according to IAN 195/16 is 4.5m

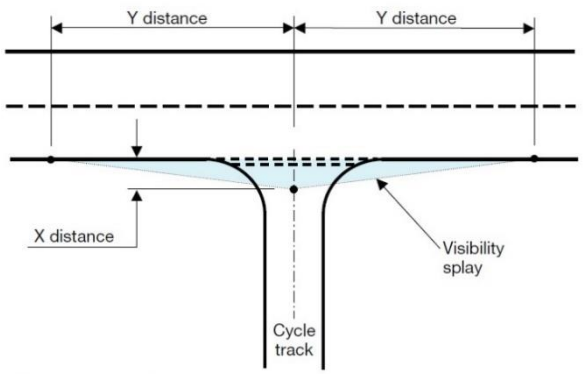


Figure 9 - Visibility at junctions

11.1.3 Junction radii

In line with North Tyneside Council's LDD12 the minimum radius that should be used on all priority junctions within residential estates would be 6m. This minimum radius increases to 10m on industrial estates to accommodate HGV movements. This figure may be reduced where appropriate subject to agreement from North Tyneside Council.

11.2 Cyclist Priority at Junctions

Whenever possible cyclists must have priority over side roads and accesses along a cycle route. This would either be through raised entry treatments of via the use of road markings.

The location of the crossing point within a junction can vary subject to the type of infrastructure. Generally cycle tracks cross a side road further away from the junction mouth than other forms of cycle infrastructure, for example a hybrid cycle track.

Photo 17 - Side road priority (British Cycling Embassy)

Photo 17 shows a cycle track with priority over the side road. Key design features for this form of junction crossing include;

- Raised level surface for cyclists through junction
- Approach and exit alignments to be smooth
- Suitable stopping space for motorists between raised crossing and main carriageway (minimum of 5m – on busy side roads, this distance can be reduced for minor accesses and driveways)
- Tight radii (6m) to keep vehicle speeds low
- Give way markings in good condition at either side of raised crossing
- Cycle symbols within junction to highlight presence of route

11.3 Raised Entry Treatments

When a cycle route runs adjacent to the main carriageway, such as a hybrid cycle track. It would be expected that a raised junction will be installed where it crosses a priority junction. Incorporating a raised table across a side road has a number of benefits. These include;

- Providing a level surface for an off-carriageway cycle route
- Providing a level surface for pedestrians walking along a footway
- Encourages slower vehicle manoeuvres at entrances to the residential estates

Photo 18 shows an example of raised tables at side roads. It would be expected that give way markings and stops lines would be set back from the junction and located at the first point of conflict with pedestrians and cyclists, i.e. the back of the footpath.

Photo 18 - Example of raised table at priority junction at The Broadway, Tynemouth

Additional design features shown in Photo 18 include;

- Tight junction radii
- Smooth alignment through junction
- Coloured surfacing to highlight presence of cyclists
- Cycle symbol within junction to highlight presence of cyclists

11.4 Priority Junction Crossings

On routes with low motorised vehicle flows such as residential service roads, where no segregated cycling infrastructure is provided, conspicuous road markings should be used at junctions.

Photo 19 - Example of priority at junctions

Photo 19 shows an example where a cycle route is directed onto a quiet residential street. At this point cyclists share the carriageway with motorists. North Tyneside Council would still expect the junction markings along the route to highlight the presence of cyclists.

11.5 Signalised Junctions

There are numerous permutations of traffic signal controlled junctions, many of which require bespoke design solutions. However, it would be expected that the finalised junction design would provide priority for cyclists in order to minimise waiting times. With this in mind, generic design considerations for signalised junctions include (but are not necessarily limited to) the following;

11.5.1 Segregated through junction

Although the design of every signalised junction is bespoke to the junction it would be expected that developers consider keeping cyclists segregated through the junction. For example, the provision of segregated cycle tracks throughout the junction.

Single phase crossings should be provided so that users of the cycle route can clear the junction in one movement.

11.5.2 Cycle Bypasses

Cycle bypasses should be considered as an appropriate facility at signalised junctions as they allow a cyclist to continue through the junction without delay. They should especially be considered on the straight-ahead movement at signalised T-junctions and left turn movements where there is no pedestrian conflict.

Photo 20 - Example of cycle bypass at signalised junction

The bypass must be physically segregated at the entry to the junction and the cycle lane should be conspicuous through the junction.

11.5.3 *Innovation - Early Release*

Providing cyclists with an 'early release' at traffic signals, giving a head start over other traffic, allowing them to negotiate busy junctions and make their intentions clear to drivers behind.

Cyclists are detected within an Advanced Stop Line reservoir which triggers the main signals to give a 3 second cyclists-only signal, plus a further 2 seconds normal red-amber phase, before other traffic is released on a standard green signal.

Traffic signals for cyclists can be mounted at low level. A local example of low level signals can be found at John Dobson Street in Newcastle.

Photo 21 - Example of an early release traffic signals head

11.5.4 *Innovation - Railing/Footrest*

At traffic signals, consider introducing a railing that cyclists can use to lean against or use as a footrest, which will allow cyclists to remain in the saddle while waiting for the lights to change.

This measure will not be appropriate at every traffic signal and overuse would increase street clutter but at key locations may be suitable.

Railings of this nature are not currently used within the UK but would be considered by North Tyneside Council.

Photo 22 - Example of railing / footrest

11.5.5 Advanced Stop Lines (ASL):

Advanced Stop Lines would be expected at the majority of signalised junctions to facilitate stacking of higher volumes of straight ahead cycle movements enhance the presence of left turning cyclists to high-sided vehicle drivers, and also to accommodate right-turning cycle movements through a junction.

Where ASL's have been provided at junctions it would be expected a suitable feeder lane is provided in order to allow cyclists to safely reach the ASL.

Photo 23 - Example of ASL with feeder lane

11.5.6 Innovation - Trixi Mirrors

Trixi mirrors are a convex mirror which can be attached to traffic signals. Their purpose is to help drivers (especially HGV's) to see down the side of their vehicles for the presence of people on cycles.

There are certain locations whereby the use of trixi mirrors will benefit a junction, in particular where there is a steady volume of turning HGV's that could conflict with cyclists.

Photo 24 - Example of Trixi Mirror at signalised junction

11.6 Roundabouts

Suitable cycle provision would be expected on all roundabouts. Conventional roundabout design is not considered suitable for cyclists, and is therefore not acceptable unless very convenient alternative crossing facilities are provided to form a continuous route. It is recognised that 'Dutch Style' roundabouts are the aim for most local authorities in the UK, in so far as successfully designing for cycling. Section 15 covers innovative roundabout ideas in more detail.

Safety, and not capacity, is the over-riding principle for good roundabout design.

The design principles are very similar to those for side roads of T-junctions.

- Approaching traffic should be slowed. This provides better gap acceptance, greater legibility for drivers and a safer cycling environment.
- Traffic speed on the roundabout should also be controlled by means of a narrow gyratory lane.
- Approach arms should be aligned towards the centre point of the island and not deflected to the left.
- Left only lanes are not recommended

When off road cycle routes traverse a roundabout, cycling and pedestrian crossings should be installed on all arms. The most suitable crossings for cycle movements would take form of a parallel crossing. TD 16/07 of the Design Manual for Roads and Bridges states that the stand-alone crossing facilities should be located to suit desire lines. If possible, they should be outside of the flared section to keep the crossing short and be located between 5m and 20m from the give way line.

Photo 25 - Example of Parallel Crossing at Roundabout in Cobalt Business Park, North Tyneside

Where crossings cannot be provided between 5 – 20m from the give way line a cycle route, a direct link should be provided to the next convenient crossing point.

11.6.1 Innovation - Dutch Style Roundabout

Dutch style roundabouts are not a common design within the UK. The key design principles of a Dutch style roundabout include;

- Single lane entries / exits
- Segregated cycle provision around and through roundabout
- Priority crossings on all arms of roundabout

It is envisaged that a roundabout of this nature could be installed on a new development. A Dutch style roundabout would have to be installed at a location where high-quality cycle links are provided on the approaches.

Photo 26 - Example of Dutch style roundabout

11.6.2 Single Lane Roundabouts

Cycle lanes must not be installed in the circulating section of roundabouts. Cyclists should either be mixed with traffic or segregated from traffic by physical means.

Depending on the traffic balance between arms, single lane roundabouts can accommodate up to 20,000-25,000 vehicles per day. Cyclists can mix with traffic on roundabouts with traffic volumes of less than 5000 vehicles per day. Roundabouts of these nature are cost effective and space efficient.

In order to minimise vehicular speeds on roundabouts designers should aim to install the circulating lane at a maximum of 4.0m wide

11.6.3 Innovation - Compact/Continental Style Roundabout

An alternative to a conventional roundabout is the Compact or Continental Style Roundabout. These cyclist-friendly roundabouts are extremely popular in cycling orientated countries throughout Europe.

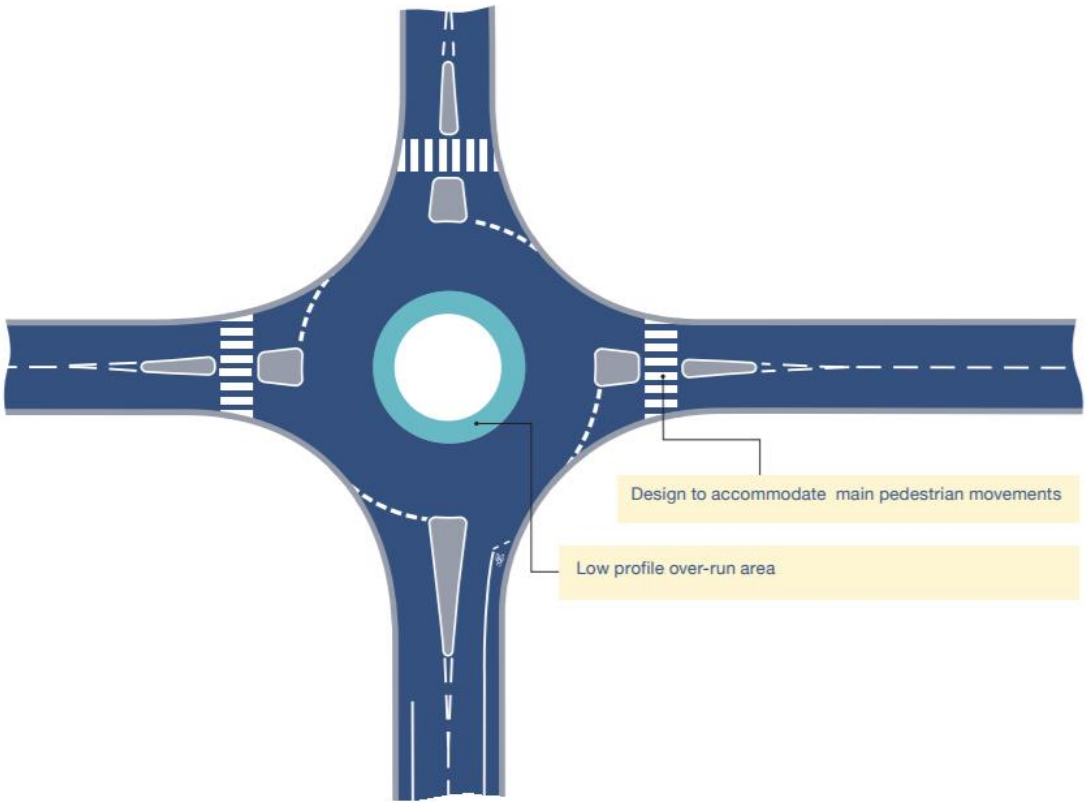


Figure 10 - Example of Compact / Continental Roundabout

Sustrans Handbook for Cycling Friendly Design offers some useful design guidance for compact/continental roundabouts:

- Perpendicular approach and exit arms
- Single circulatory lane, single lane approaches (4m) and single lane exists (4-5m)
- External diameter (ICD) 25-35m
- Island diameter (including overrun area) 16-25m
- Circulatory carriageway 5-7m
- Roundabout capacity approx. 25,000vpd, but consideration should be given to other options for cyclists where flows exceed 10,000vpd

11.6.4 Multi Lane Roundabouts

Multi lane roundabouts, with one or more circulating lanes and / or multiple approach and exit lanes, are not suitable for cyclists. In these circumstances off carriageway segregated cycle routes with suitable crossing points would be expected. Designs for roundabouts will be agreed with the Local Authority on an individual basis.

11.6.5 Innovation – Informal Roundabouts

An informal roundabout is designed to encourage drivers to adopt circulatory priority, but they are in fact uncontrolled junctions, with no formal road markings or signs. Some informal junctions are designed with circular paving patterns to operate this way. A design of this nature could be included within a shared space / home zone area.

These have been found to work well in capacity and road safety terms at relatively high flows, of up to around 2500 vehicles per hour, though on cycle routes their use should be restricted to lower traffic volumes, preferably no more than 1000vph.

In terms of cycling, this type of junction can work well as long as care is taken to ensure that vehicles only circulate in one traffic stream and travel slowly, so that cyclists can adopt the primary position when passing through the junction, in a similar way to the Continental design of roundabouts.

Photo 27 - Example of Informal Roundabout

11.6.6 Mini Roundabouts

Mini roundabouts must not be provided on cycle routes as they can be more difficult for cyclists to negotiate. Mini roundabouts mostly have a single lane approaches and as the entries and exits are close together it can be difficult to anticipate vehicle movements. Due to the lack of physical kerbs mini roundabouts can be overrun my motor vehicles and this can provide temptation for motorists to overtake on the mini roundabout.

11.7 Grade Separated Crossings

Grade Separated crossings can take the form of Underbridges (Subways) or Overbridges.

The location and alignment of underbridges and their accesses should be arranged so that cyclists do not have long diversions from a direct line of travel. The length of the underbridge should be minimised in order to maximise natural light levels, and the gradient of access ramps should also be minimised. These design characteristics can help maximise forward visibility and levels of natural light as well as the comfort of users travelling through the underbridge.

According to IAN 195/16, a minimum width of 3.0m shall be provided for two-way cycle traffic, however designers should aim to increase this dimension or other elements of the cross-section to increase the attractiveness of the facility by increasing the amount of natural light in the structure. The desirable minimum headroom for an underbridge is 2.5m with an absolute minimum of 2.2m. These dimensions increase when the presence of equestrians are expected. Photo 28 shows an example of an underbridge with a smooth level cycle track access.

Photo 28 - Example of underbridge in Bristol

Where an overbridge is being introduced because a road severs a route, the overbridge should be sited and aligned to minimise the diversion from any existing cycle routes.

Overbridges for use by cycles and pedestrians only, are generally designed for two-way use and shall conform to the design parameters for cycle traffic. According to IAN 195/16 and DMRB BD 29/17 Design Criteria for Footbridges, the width of a two-way cycle track should be a minimum of 3.0m plus an additional 0.5m margin clearance to each parapet. The 4m dimension will help maintain effective widths (See Figure 1). Where the overbridge is covered, the headroom should be the same heights covered in the underbridge section. The gradient of the approach ramps should be no greater than 5%. These dimensions increase when presence of equestrians is expected.

Photo 29 - Example of Footbridge over A5 near Nesscliffe Hill

The height of a pedestrian parapet must be in accordance with Table 1 pf BS7818 and the relevant class of user (i.e. pedestrian, cyclists or equestrian). On bridges with cycle and equestrian provision the height of the parapet above the adjoining paving surface must be 1.8m. Where a parapet height of 1.8m has been used, a 600mm high solid infill panel must be provided at the bottom of the parapet in order to obstruct the animal's view of the road below.

More information on the design of underbridges and overbridges can be found in Section 2 of the Design Manual for Roads and Bridges.

11.8 Crossings at Grade

11.8.1 Parallel Crossings

The Parallel crossing is the preferred form of crossing in North Tyneside as they minimise the waiting time for cyclists and motorists. The Traffic Signs Regulations & General Directions 2016 has created a new crossing type that would allow for parallel pedestrian and cycle crossings without the need for signal controls. This priority crossing is similar in appearance to a zebra crossing but with a parallel route for cyclists.

The pedestrian aspect limits of the crossing vary from a minimum of 2.4m to a maximum of 10m. The width of the cyclists' side of the crossing can vary from a minimum of 1.5m to a maximum of 5m. The width would be determined by the volume of pedestrians and cyclists using the route.

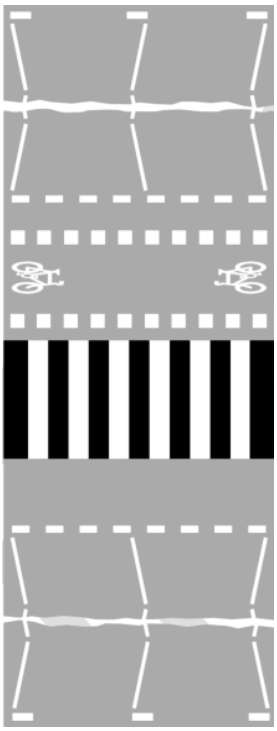


Figure 11 - Parallel Crossing Layout from TSRGD 2016

Photo 30 - Example of Parallel Crossing in North Tyneside

11.8.2 Toucan crossings

A toucan crossing is a signalised crossing shared by both pedestrians and cyclists. They are normally unsegregated, although sometimes a segregated Toucan can be more appropriate. Where a signalled controlled crossing is justified in the vicinity of a new development, a toucan crossing will usually be required. Should the crossing be required on an equestrian route, a Pegasus crossing should be provided with its pole positioned accordingly.

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 pedestrian crossing points. The preferred width of a toucan crossing is 4.5m. This will provide sufficient width for both pedestrians and cyclists to cross at the same time. The crossing should be single stage which will allow for one continuous movements across the carriageway.

Toucan crossings can be installed at a minimum width of 3.6m. However, North Tyneside Council will only consider using the minimum width where site constraints exist.

The provision of advanced detector loops on the cycle track must be considered in order to reduce the waiting time at crossings for cyclists. These loops must be considered on key routes, particularly routes with a high commuter use.

Photo 31 - Example of Toucan Crossing

11.8.3 Central Islands

Central islands must be wide enough to accommodate waiting cyclists and pedestrians safely. The target minimum island width for straight across movements is 2.5m. The minimum width of a staggered island would be 3m.

Where refuges are installed the safety of cyclists travelling through the localised narrowing must be considered. LTN 02/08 advises that gaps of between 2.75m and 3.75m should be avoided as they may encourage motorists to overtake cyclists even through there is insufficient width. A minimum width of 4m is recommended to enable such a manoeuvre.

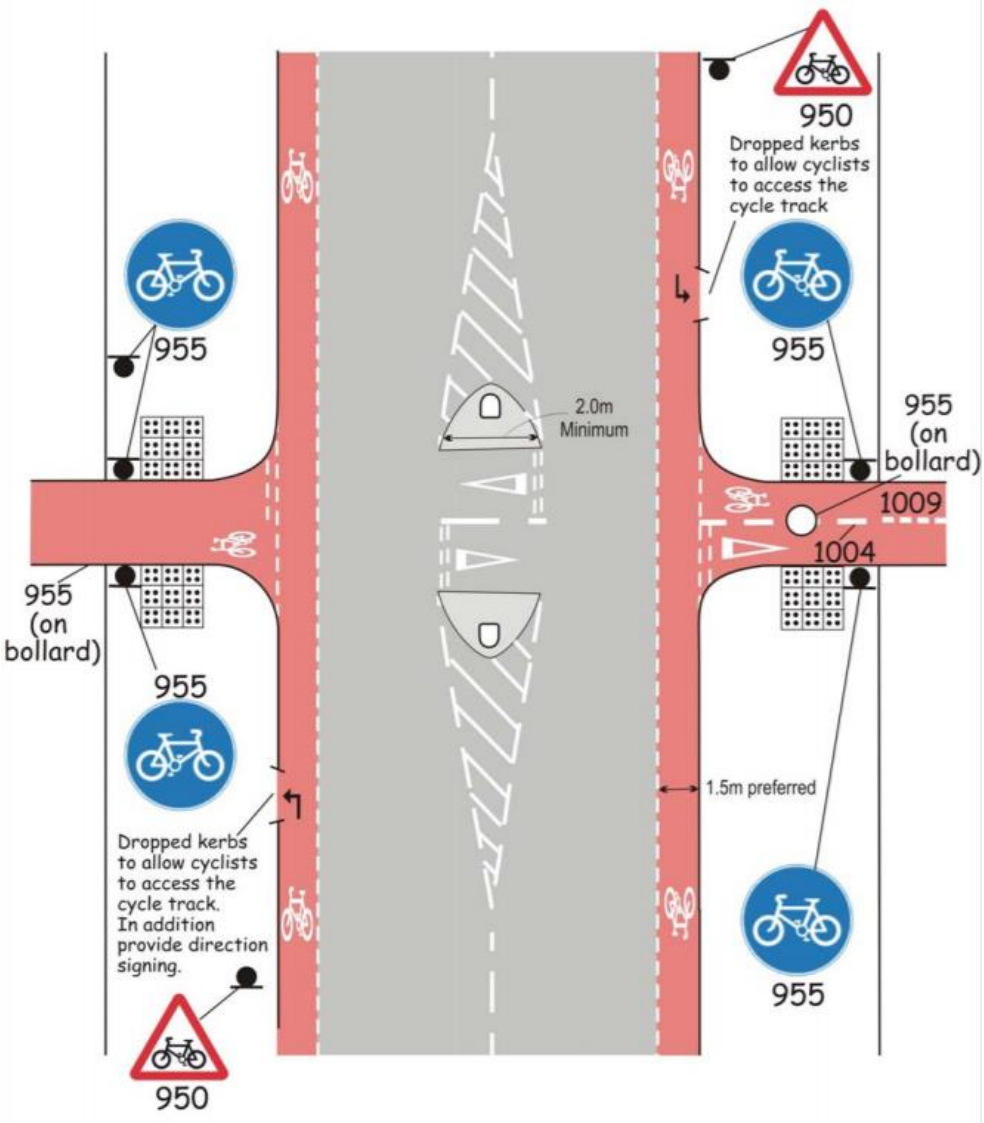


Figure 12 - Uncontrolled Cycle Crossing at widened island (Nottinghamshire Cycle Design Guide)

11.8.4 Raised crossing facilities

Where a cycle track crosses a relatively lightly trafficked street, the cycle track can be given priority over the road. The crossing should generally be sited on a flat-topped road hump to ensure low vehicle speeds. This treatment can be used at crossings of side roads where they join a larger road, or mid link.

The design in both situations should ensure that it is clear to motorists that they must give way, and that there is sufficient intervisibility between drivers and users approaching the road along the cycle track. This helps cyclists to maintain momentum as well as ensuring safety.

At locations where a cycle route crosses a minor road with low vehicle flows (less than 4000vpd), the cycle track may give way to carriageway. However, it is still recommended that a flat topped road hump is installed at the crossing point to maintain low vehicle speeds

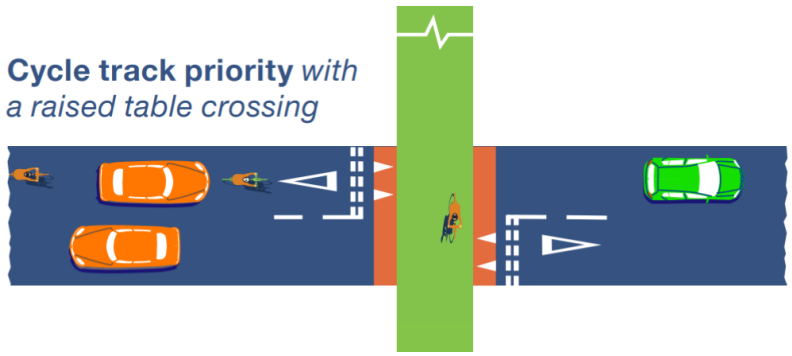


Figure 13 - Raised priority crossings (extract from Sustrans Design Manual)

12. Signs, Road Markings and Lighting

12.1 Signs and Road Markings

All cycle routes require appropriate signage. Detailed information on cycle related signs and road markings can be found in Appendix C.

Signs must not be situated in the middle of a cycle lane, track, route or shared cycleway / footway. Any sign mounted over a form of cycle infrastructure must maintain a minimum clearance of 2.5m.

Route destination signs would be expected at key decision points along a route. There may be occasions where North Tyneside Council will stipulate the requirement for a financial contribution to a commuted sum of funding to be spent on route signage in the vicinity of the development. All route signage will need to be agreed with North Tyneside Council. Figure 14 below shows examples of the route destination signage installed in North Tyneside. All route destination signage is installed with a height of 24 X and should reflect the destinations highlighted on the Tube Map (Appendix B).

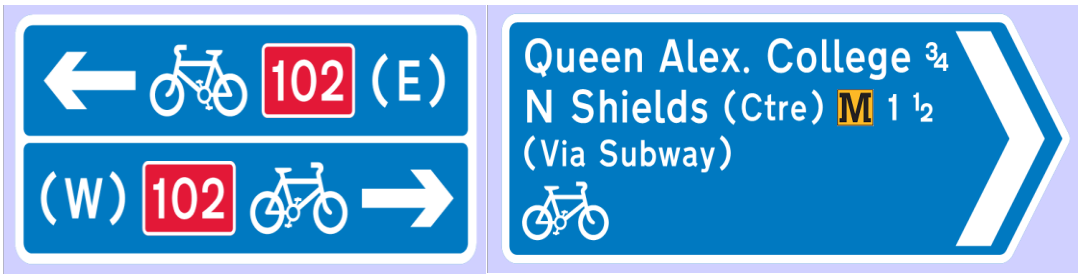


Figure 14 - Typical Route Destination Signage

In order to keep street clutter to a minimum. It would be expected that signage is incorporated into street furniture (e.g. bollards, lighting columns etc.).

Photo 32 shows an example of a segregated shared use cycle symbol installed on a bollard. This will reduce the need for the sign to be installed on a separate post.

Photo 32 - Example of TSRGD 957 on Bollard

12.2 Street Lighting

Lighting is normally provided on urban routes where cycling can be expected after dark. Lighting helps users detect potential hazards, discourages crime and helps users to feel safe.

Cyclists using two-way cycle tracks alongside unlit carriageways may be blinded or dazzled by the lights of oncoming vehicles, particularly on tracks alongside high-speed rural roads. Drivers may also be confused when seeing cycle lights approaching on their nearside. These hazards can be reduced by, for example, locating the track as far away as possible from the carriageway edge, or by providing with-flow cycle tracks alongside both sides of the carriageway.

Cycle routes across large quiet areas may not be well used outside peak commuting times after dark, even if lighting is provided. In these cases a suitable street lit on-road alternative that matches the desire line as closely as possible should be avoided. Subways should be lit at all times, using vandal-resistant lighting where necessary. It is not expected that routes outside built-up areas used primarily for recreation would normally need to be lit except where there were road safety concerns, such as at crossings or where the track is directly alongside the carriageway.

There may be occasions when North Tyneside Council stipulate the requirement for existing public footpaths and bridleways to be lit in the interests of safety.

Photo 33 - Example of low level lighting on cycle route (Canada)

Where an off-carriageway track requires lighting, the designer needs to consider the proximity of an electricity supply, energy usage, and light pollution. In these instances the use of low level (such as bollards) or surface level lighting should be considered.

13. Cycle Parking

In order to support journeys by bike, convenient cycle parking must be provided at key destinations, for example local shops or high streets etc. Public transport accessibility can also be greatly increased by providing good quality cycle parking at key bus stops and metro stations. There may be occasions where North Tyneside Council will stipulate the requirement for a financial contribution to a commuted sum of funding to be spent on cycle facilities at a metro station or shopping area near the development site.

If a development has community facilities, such as local shops or libraries etc. then there must be sufficient cycle parking for the likely number of visitors or employees. If the development is a commercial development (offices, supermarkets), cycle parking should be provided next to the main entrance for visitors. The cycle parking should be located closer to the visitor entrance than vehicle parking. Separate cycle parking, in the form of lockable shelters, would be expected for employees and should be located near the employee entrance.

North Tyneside Council's preference for cycle parking is the traditional Sheffield cycle stand as it is a simple, robust and effective parking facility. More secure measures are preferred at public transport interchanges or locations with cycles may be left for a longer period of time (i.e. Metro stations). Photo 34 shows an example of a Streetpod which could be used at Metro Stations.

Photo 34 - Example of Streetpod

Photo 35 - Sheffield Cycle Stands at Cambridge Primary School (Cyclestreets)

Photo 35 shows an example of cycle parking at a primary school and Figure 15 shows the typical layout of the cycle stands. The positioning of the cycle stands in relation to vertical features is key. The designer should ensure cycle stands are positioned a minimum of 1m away from vertical features to ensure the parking facility is usable.

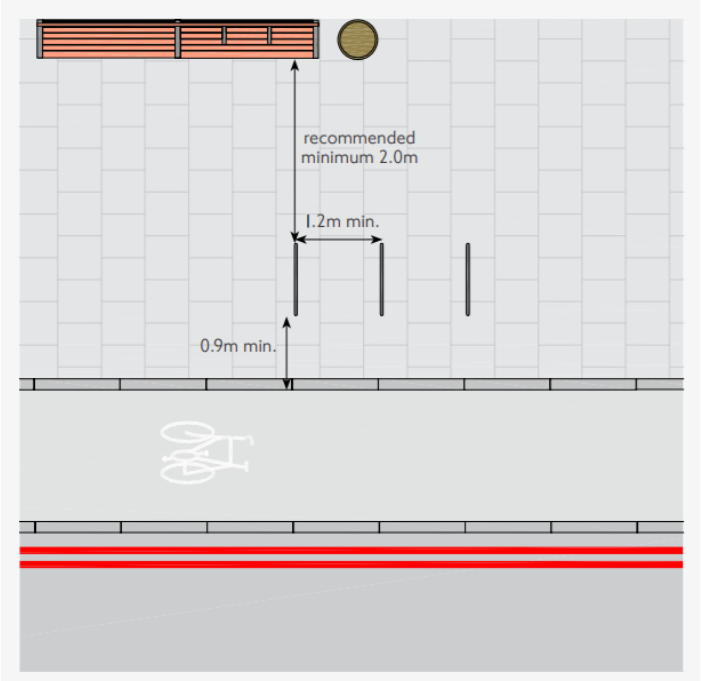


Figure 15 - Layout of Sheffield Cycle Stands (LCDS)

14. Construction and Maintenance

14.1 Adoption

Designers must consider the practicality of North Tyneside Council adopting new cycling infrastructure provided as part of the development. Designers should be aware of the level of maintenance involved with the infrastructure. North Tyneside Council may choose not to adopt streets which use forms of infrastructure with a high maintenance liability.

Designers should generally look to utilise standard paving materials. If it is proposed to depart from this, then a discussion with the Council would be required to confirm what is acceptable.

14.2 Construction

It is important that high quality cycle facilities are consistently implemented across North Tyneside, 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.
- Finished levels of all surfaces within a cycle route must be machine laid. This will ensure the cycle track is smooth, flat, well-drained and well-maintained
- Construction joints should be at right angles to the direction of travel.

The construction details should be suitable for everyday cycling. It is envisaged the construction specification shown in Figure 16 will suffice for the majority of off-road links.

More comprehensive details, including bridleway construction, can be found in North Tyneside Council's Highway Design Specification.

14.2.1 Cycleway/Footway Construction

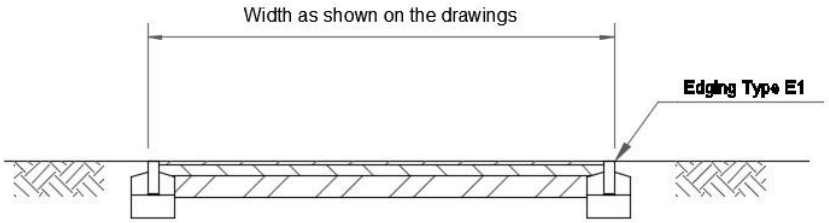


Figure 16 - Typical cycleway construction

Table 5 - Construction Details

Construction Details	Layer thickness
Surface Course 6mm size Dense Macadam to Cl. 909	20mm
Base Course Dense Macadam to Cl. 906	50mm – 20mm nominal aggregate size
Sub-base Type 1 Granular Material to Cl. 803	200mm

14.2.2 Coloured Surfacing

The provision of coloured surfacing is believed to improve cycle infrastructure as it further enhances it presence, making it more conspicuous to motorists. 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. 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
- Along the full route on hybrid cycle tracks.

The preferred type surfacing material consists of the use of coloured aggregate within the surface course. The Councils' recommended surfacing material is Tarmac Ulticolour. The recommended colour is classic green.

14.2.3 Vegetation

All small plants / bushes planted within the vicinity of cycling infrastructure must be set back a minimum distance of 1.0m, then gradually increase in height as the distance from the cycle track increases. This prevents interference with the cycle route should the vegetation become overgrown, meaning less maintenance is required.

All trees should offset a minimum of 5m from all forms of cycle infrastructure. This is to prevent the canopy from overhanging the route and the tree roots from impacting on the integrity of the cycle infrastructure. Tree root protection grids must be provided where trees are located within 5m of cycle tracks.

14.3 Tactile Paving

It is important that appropriate tactile paving is installed as part of cycle route infrastructure. Corduroy paving should be provided where a footpath or footway joins a segregated route. However, cycleway tactile paving should be used to delineate the start, end and regular intervals of a segregated route. On the cyclist's side, the raised bars should be in the direction of travel. On the pedestrian side the raised bars should be laid transversely across the direction of travel. The cycleway tactile paving should be 2.4m deep at the start / end of the route and 800mm deep at regular intervals. Care should be taken to ensure tactile paving is used in correct locations.

The Department for Transport produced a Guidance of the use of Tactile Paving Surfaces document which provides detailed information on all forms of tactile paving. The document also includes several detailed layouts of tactile paving which is useful for designers.

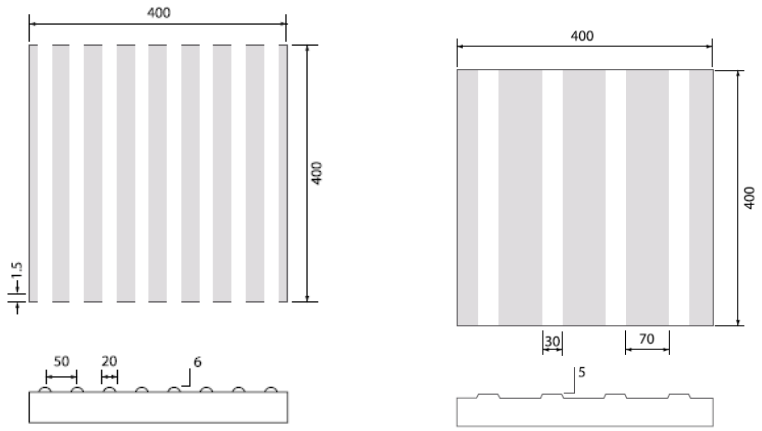


Figure 17 - Corduroy tactile paving (left) and Cycleway tactile paving (right)

14.4 Maintenance

Until adoption takes place, developers have a responsibility to ensure their cycle routes are kept in good condition, making them more useful, attractive and popular than one allowed to deteriorate. Maintenance can often be an afterthought in comparison to designing and constructing new routes but having invested time and money implementing cycling infrastructure, it is important that it remains attractive to users.

Maintenance should be considered as part of the route development process long before construction starts. A thoughtful design will mean less maintenance in the future.

Regular inspections should be undertaken whilst developing and any repairs or problems should be prioritised and dealt with quickly. Failure to maintain the infrastructure may result in North Tyneside Council refusing to adopt the asset.

14.4.1 On Road Routes

When cycling on roads and the quality of the surface can make a huge difference to the cyclist's experience of using a particular road. As a minimum, the following maintenance should be undertaken on all on road cycle routes:

- Routes to be kept ice free
- Loose drain covers and potholes to be repaired swiftly
- Drainage channels and gullies to be cleared regularly
- Worn road markings or coloured surfacing to be refreshed
- Damaged or lost signs to be repaired or replaced
- Maintenance of 2m nearest to kerb to be prioritised. Potholes should be repaired with a smooth level surface patching rather than simple pothole repairs.
- To be swept free of debris
- Cyclists to be accommodated at road works

14.4.2 Off Road Routes

Cycle routes segregated from traffic can quickly become unattractive and difficult to use if maintenance is not undertaken and the route is not kept clear. As a minimum, the following maintenance should be undertaken on all off road cycle routes:

- Surface damage to be repaired promptly
- Drainage channels and gullies should be cleared regularly
- To be swept free of debris
- Verges to be mowed regularly to prevent encroachment onto cycle route
- Vegetation to be cut back regularly (outside of bird nesting season)
- Damaged or lost signs to be repaired or replaced swiftly
- Lighting, street furniture and structures to be maintained

Failure to undertake this maintenance may result in North Tyneside Council refusing to adopt this asset.

14.4.3 Buffer Zones

The buffer zones for cycle routes should be installed with a material that is easily maintainable. Grass verges are the preferred buffer zone. Although they should only be used where a buffer zone of 1m or wider can be provided.

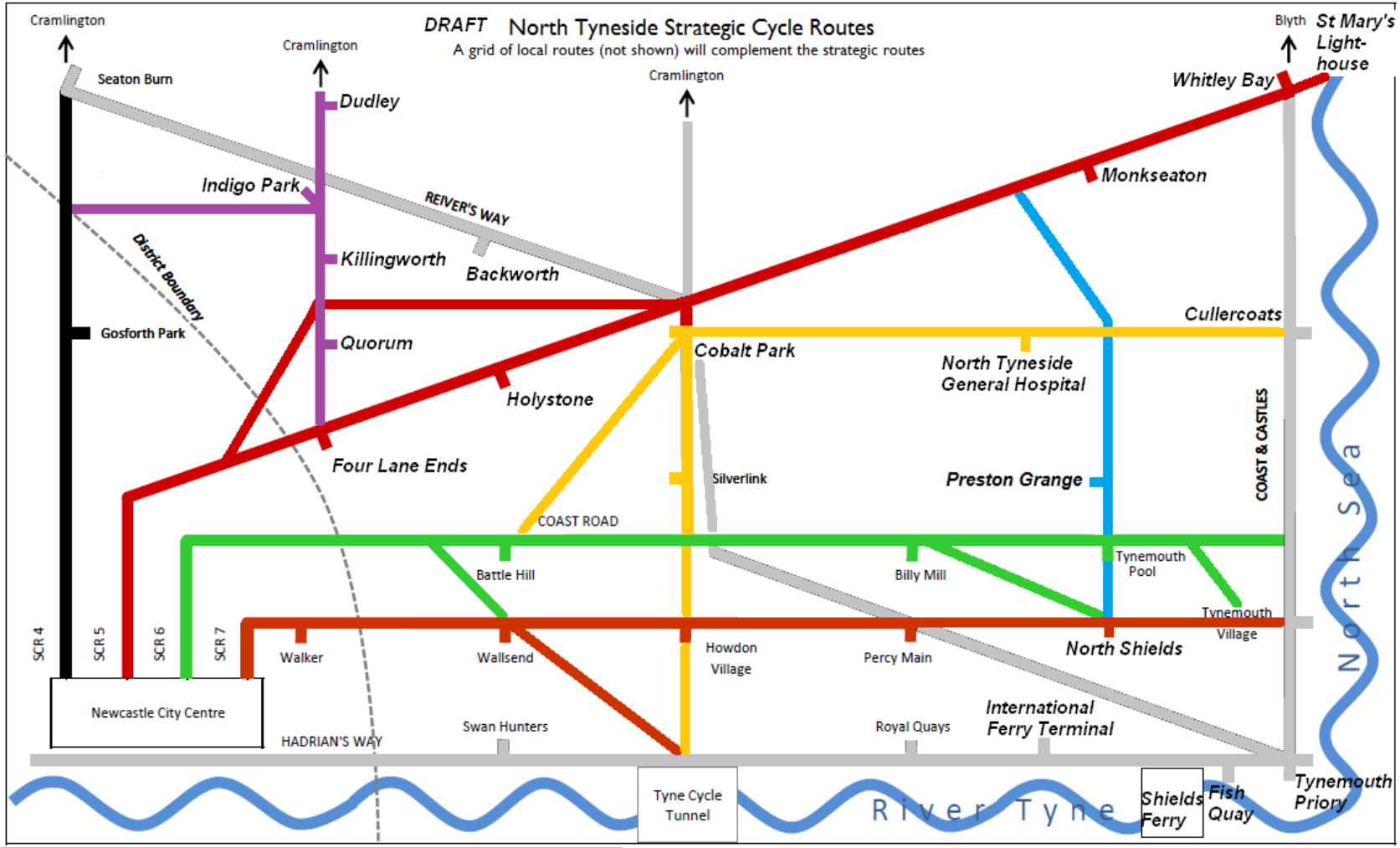
In instances where buffer zones are less than 1m block paving will normally be used to reduce maintenance issues. Buffer zones less than 1m should be 50mm higher than the cycle route for safety reasons. The recommended block paving is Marshall's Keyblok concrete block paving. The recommended colour is Brindle.

Appendix A – Cycling Design Guidance

The following documents / sources have been considered when developing the North Tyneside Cycling Design Guide.

- LTN 1/12 Shared Use Routes for Pedestrians and Cyclists
- LTN 2/08 Cycling Infrastructure Design
- Traffic Signs Regulations and General Directions 2016
- Traffic Signs Manual Chapter 5 (Road Markings)
- Sustrans Design Manual 2014
- London Cycling Design Standards 2016
- Design Guidance: Active Travel (Wales) Act 2013
- IAN 195/16
- Manual for Streets 2
- Greater Manchester Cycling Design Guidance
- Making Space for Cycling
- North Tyneside Council Development Construction Manual (In preparation)

Appendix B – NTC Cycle Tube Map



How will we deliver this?

- Bidding for external funding for sections of route
- Through the planning process, as new developments are brought forward
- Through the general programme of highway schemes and regeneration schemes

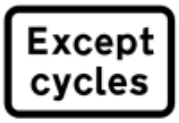
Appendix C – Signs and Markings

Mandatory and Informatory Signs

There are a number of mandatory and informatory signs associated with cycle facilities. Table 6 shows the signs as specified in Traffic Signs Regulations and General Directions (TSRGD), 2016. 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 6 - Signs associated with cycle facilitates

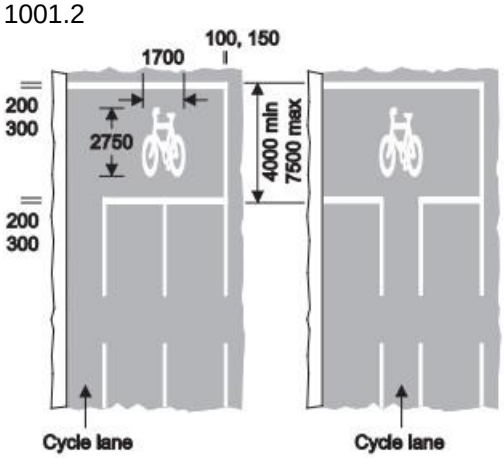
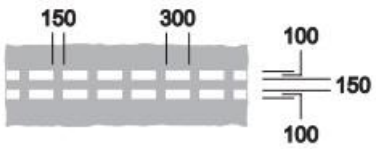
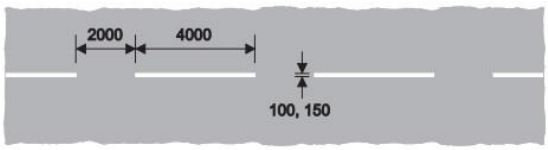
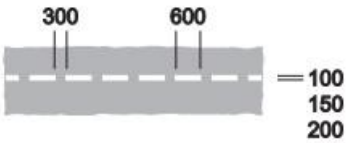
Diag. No (TSRGD)	Description	Suggestion Dimensions
955 	Cycle routes that are segregated from both motorised traffic and pedestrians.	Terminal: 600mm diameter Repeater: 300mm diameter
956 	Unsegregated shared cycle/footways	Terminal: 600mm diameter Repeater: 300mm diameter
957 	Segregated shared cycle/footways separated by the marking Diag. No. 1049B, 1049.1, or by physical means. The sign is reversed in a mirror image when the route reserved for cycles is on the right.	Terminal: 600mm diameter Repeater: 300mm diameter
958.1 	With-flow mandatory cycle lane ahead to always be provided where possible. To be omitted with caution. Use of time qualifying plate optional. On 20-30mph roads, sign sited 20m in advance of taper with a minimum clear visibility distance of 45m.	20-30mph: 825mm x 800mm 40mph+: 990mm x 960 mm
959.1 	With-flow mandatory cycle lane. To be provided immediately following taper and junctions. No two signs should be more than 300m apart. Use of time qualifying plate optional.	20-30mph: 825mm x 800mm 40mph+: 990mm x 960mm
960.1 	One-way road with a mandatory contraflow cycle lane. The number of upward pointing arrows may be varied to indicate the number of lanes available to all traffic	825mm x 475mm

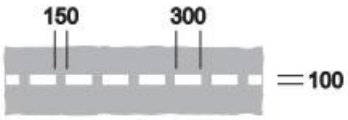
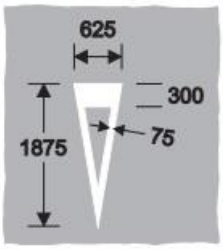
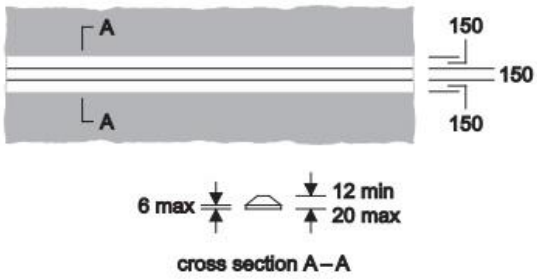
962.1 	Cycle lane on a road at junction ahead or cycle track crossing road. Warns road users of potential conflict with cycle route. Generally unnecessary except for situations where contra-flow cycling is permitted. Use of time qualifying plate optional	X height: 50
963.1 	Direction in which pedestrians should look for approaching pedal cycles when crossing a cycle lane. Generally unnecessary except for situations allowing contra-flow cycling. Variants regarding cycle flow direction are permitted.	X height: 50
965 	Although it is recognised as a standard sign in the TSRGD 2016 North Tyneside Council will not permit the provision of this sign as part of an application unless of mitigating circumstances..	X height: 40
966 	Although it is recognised as a standard sign in the TSRGD 2016 North Tyneside Council will not permit the provision of this sign as part of an application unless of mitigating circumstances.	X height: 40
967 	Advisory cycle lane on the main carriageway of a road. To be provided immediately following taper and junctions. No two signs should be more than 300m apart.	20-30mph: 440mm x 300mm 40mph+: 550mm x 375mm
954.4 	Supplementary plate that can be used below the following signs • No Entry • No Left / Right turns • No through road • One way	X height: 50

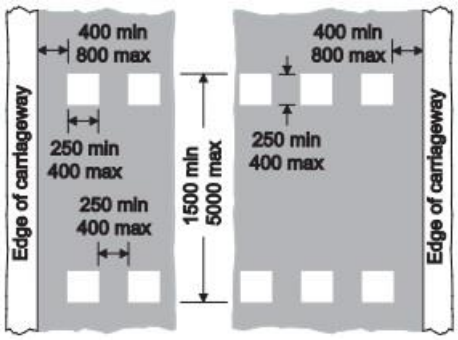
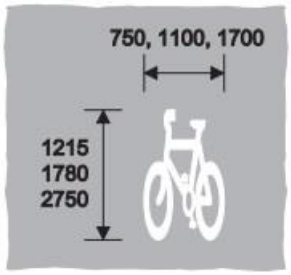
Markings

The use of road markings is as cyclists tend to spend a lot of time focusing on the surface in front of them.

Table 7 - Road markings associated with cycle facilitates

Diag. No. (TSRGD)	Description	Suggested Dimensions
1001.2 	Alternative to the stop line Diag. No. 1001, providing a reservoir for cycles at signalised junctions.	Reservoir: 4000mm-7500mm Stop lines: Urban areas – 200mm Rural areas (or 85th percentile speed greater than 35mph) - 300mm 1057: 1700mm
1003B 	Cyclists must give way	300mm line, 150mm gap
1004 	Use to mark the boundary of an advisory cycle lane.	4.0m line, 2.0m gap. 40mph or less : 100mm wide Greater than 40mph (or contraflow): 150mm wide
1009A 	Used to indicate the start of a cycle lane. Recommended taper of 1:10.	600mm line, 300mm gap. 40mph or less : 150mm wide Greater than 40mph: 200mm wide TSRGD 2016 indicates a 100mm wide line can be used but no technical

		guidance currently exists.
1009B 	Edge of the carriageway at a junction of a cycle track and another road.	300mm line, 150mm gap, 100mm wide
1023B 	Approach to a road junction on a cycle lane or track on which is placed the marking Diag. No. 1003B. Marking only normally required when cycles lose priority at a junction. Where they meet another path/ track, vehicular access or a lightly trafficked side road a dashed line to diagram 1003 should be sufficient.	625mm x 1875mm. .
1049.1 	Use to mark the separation of cyclists and pedestrians on shared use cycleway/footway. More easily detected by blind and partially sighted pedestrians.	150mm solid white line. 150mm raised profile. 150mm solid white line.
1049B 	Use to mark the boundary of a mandatory cycle lane or to separate cyclists and pedestrians on shared use cycleway/footway.	150mm solid white line.
1055.3	Route for cyclists across a signal controlled junction or parallel crossing. Can be used in conjunction with diag. no. 1057	0.4m x 0.4m marking, 0.4m x 0.4m gap.

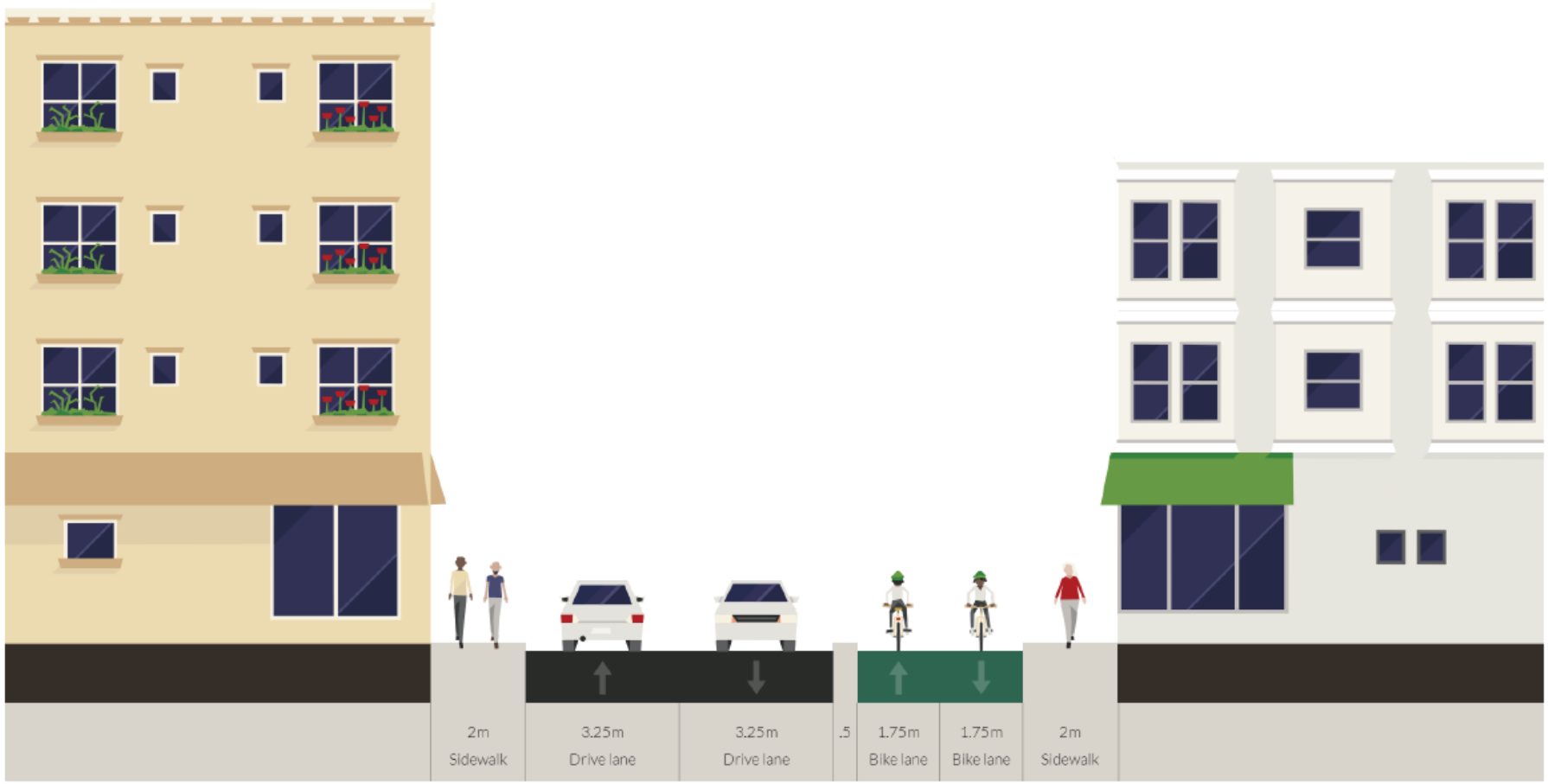
		
1057 	Cycle symbol indicating cycle lane, track or route. Should be provided after each decision point on cycle lanes and tracks, and at a maximum interval of 200m elsewhere. Where practical, cycle symbols should be placed close to street lights to maximise visibility after dark.	Defined cycle facilities: 1215mm Shared streets: 1780mm

Note: Surface treatments can also be used for ‘implied markings’. For example, an implied zebra across a cycle track near a bus stop.

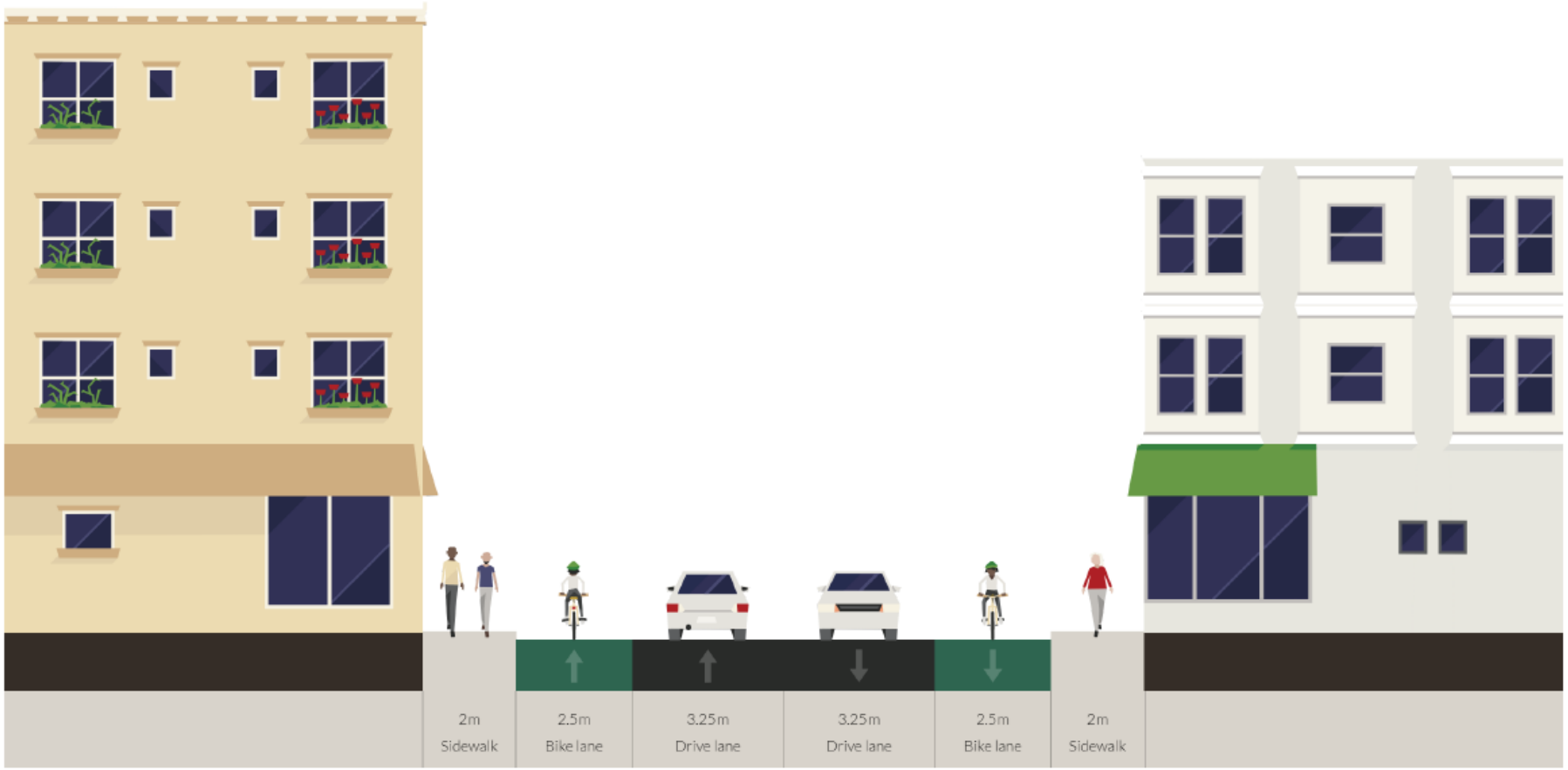
Appendix D – Infrastructure Cross Sections (*Credit Streetmix*)

Cycle Track - on both sides of the road

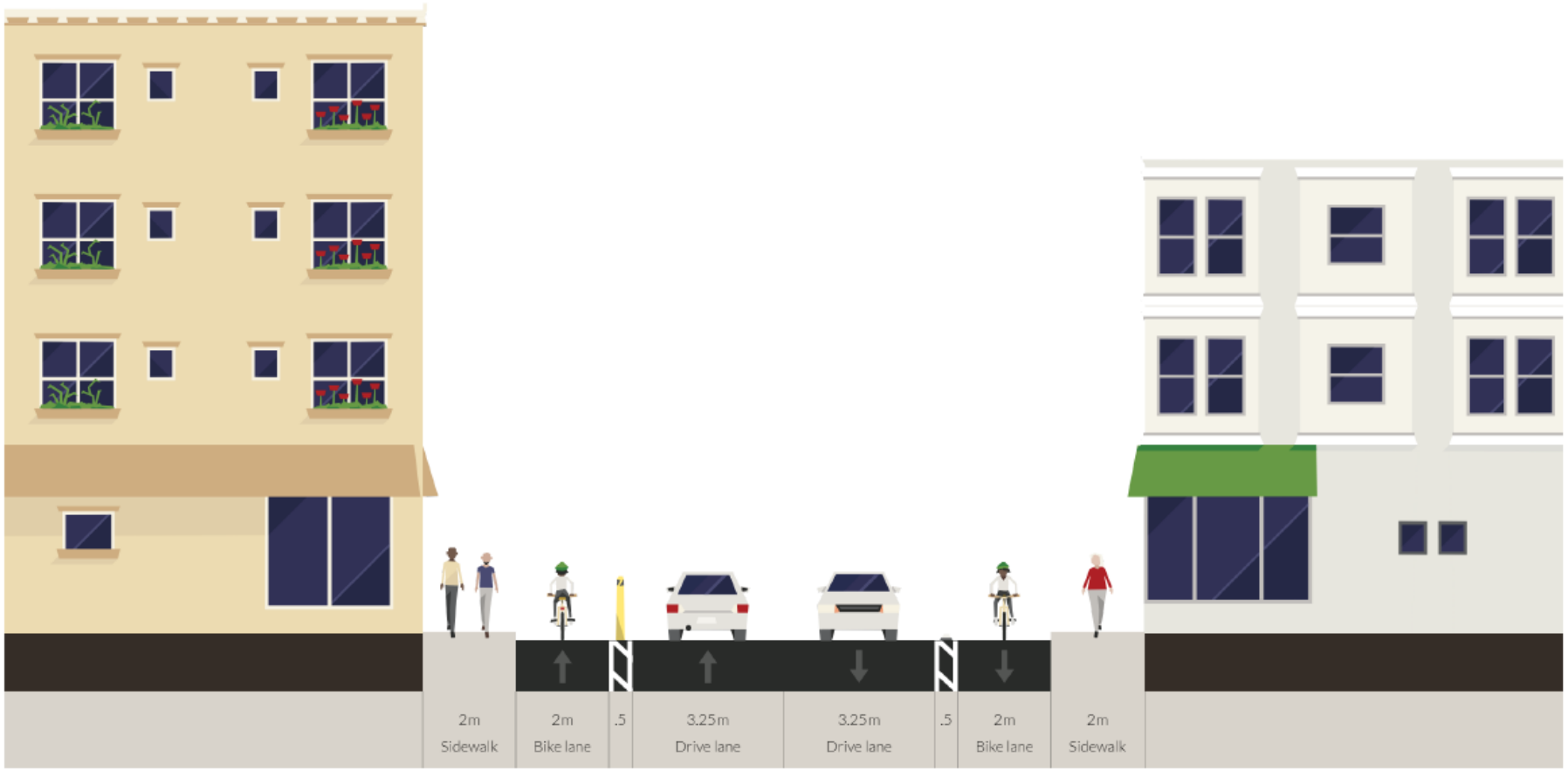
Cycle Track – on one side of the road



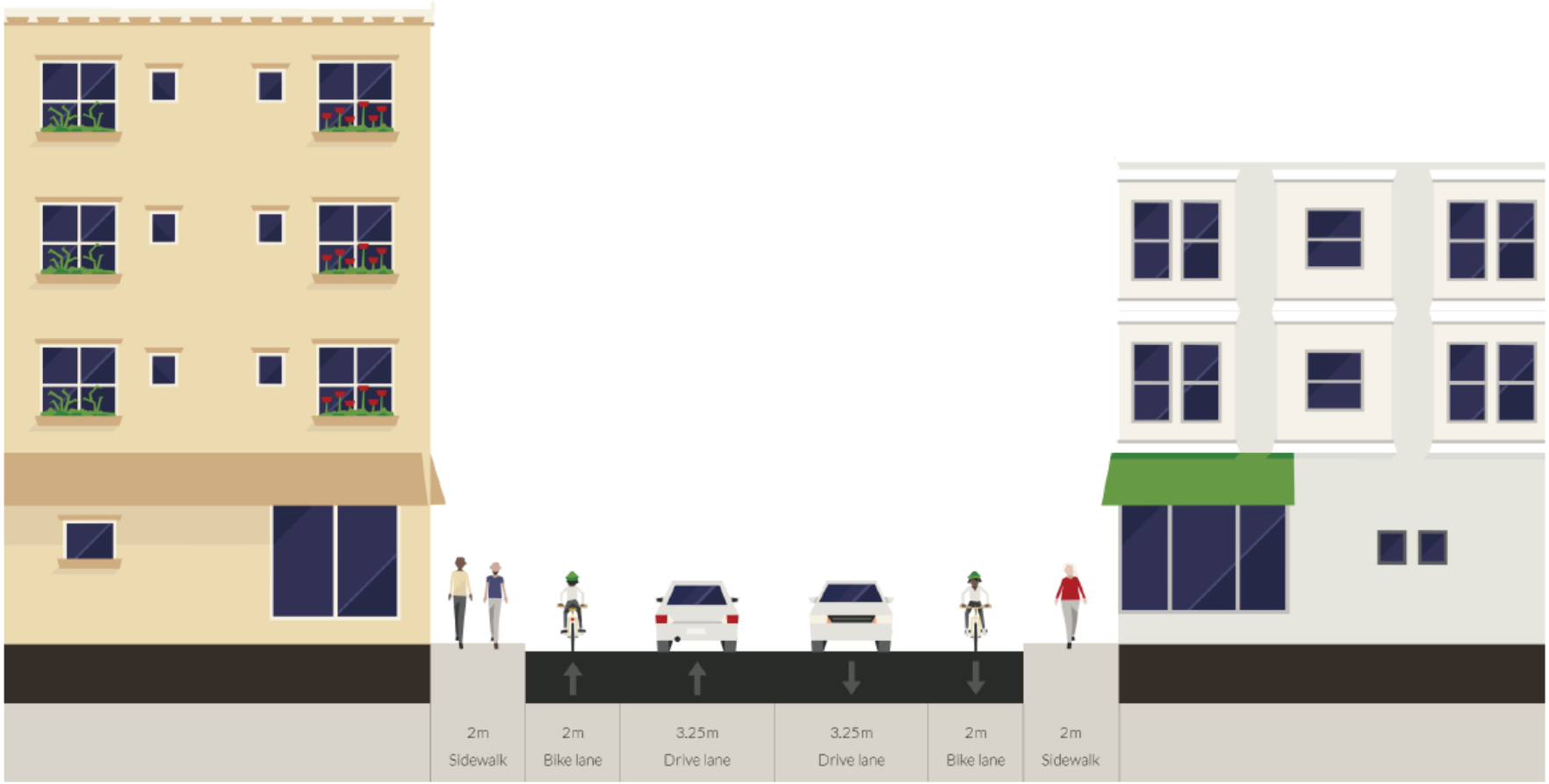
Hybrid Cycle Track



Light segregation



Cycle Lanes


2m
Sidewalk
2m
Bike lane
3.25m
Drive lane
3.25m
Drive lane
2m
Bike lane
2m
Sidewalk

Shared route – segregated

Shared route - unsegregated

Capita Property and Infrastructure Ltd
The Quadrant
The Silverlink North
Cobalt Business Park
North Tyneside NE27 0BY