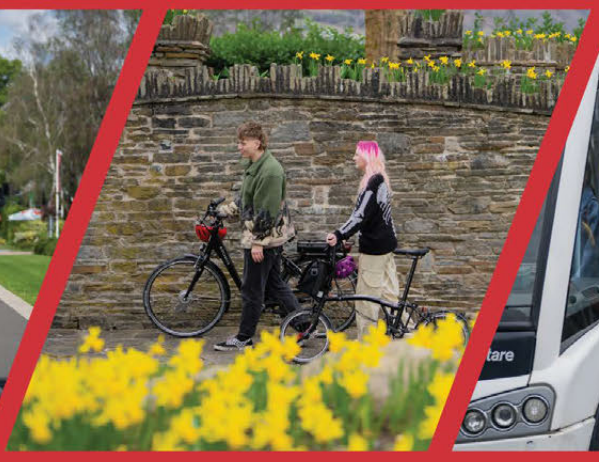


Llywodraeth Cymru
Welsh Government

Active Travel Act Guidance

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Ministerial foreword



Mark Hooper MS

Deputy Minister for Transport

Active travel is about much more than how we get from one place to another. It is about the kind of Wales we want to build: healthier, fairer, greener and more connected. Walking, wheeling and cycling can help us make everyday journeys in ways that improve our health and wellbeing, reduce household costs, strengthen communities and protect the environment we all depend on. For these reasons, active travel has often been described as a 'magic pill' – a simple remedy for a wide range of problems. Making journeys by walking, wheeling or cycling is also a positive choice – there is joy in a child learning to ride to school along a safe and welcoming street, in an older person being able to reach local shops independently, and in the simple freedom of travelling under our own power.

However, we know that, in practice, walking, wheeling or cycling is not always the easiest or most accessible choice. This revised Active Travel Act Guidance is an important part of making the improvements that are needed to make active travel a genuine option for many more people and for many more trips in Wales.

It will support local authorities and other practitioners to plan, design and deliver high-quality active travel networks across Wales. It builds on the ambition of the Active Travel (Wales) Act 2013 and reflects the learning, evidence and experience gathered since the previous guidance was published in 2021. I am grateful to everyone who has contributed to the consultation process and helped us strengthen the guidance, making it clearer, more inclusive and practical.

That is why inclusion is at the heart of this guidance. Active travel must work for everyone: disabled people, children, families, older people, people who are neurodivergent who may find navigation challenging, people using mobility aids, people without access to a car, and those whose journeys are shaped by caring responsibilities, shift work or limited incomes. Designing for the widest range of people from the outset is essential to creating networks that are safe, attractive and genuinely useful.

Good active travel infrastructure should also create places where people feel they belong, where streets are not just corridors for traffic but part of the shared life of our towns, cities and villages.

Most fundamentally, walking, wheeling and cycling routes must connect people to the places they need to reach: schools, workplaces, health services, shops, community facilities and public transport. Better integration with bus and rail services will make sustainable travel a practical option for more journeys and help create an integrated transport system that gives people real choice.

This revised guidance is a foundation for delivery. We need ambition, consistency and collaboration across Wales so that active travel becomes a normal, safe and enjoyable part of everyday life. Achieving this means listening to communities, using evidence to inform decisions, investing in quality, as well as effectively promoting and maintaining what is built.

I want this guidance to help build a Wales where more people can choose to walk, wheel and cycle because the routes are there, the conditions feel right, and the benefits are shared. This way, active travel can help us improve public health and reduce emissions, but it does more: it helps us build stronger social connections, enjoy the pleasure of fresh air, the confidence of independence, and the freedom to move through our communities in ways that are good for us and for future generations.



Part 1: Delivery of Active Travel in Wales

Chapter 1: Introduction

1.1 Active travel in Wales

1.1.1 Active travel is a term used to describe walking, wheeling and cycling for purposeful journeys to a destination, or in combination with public transport. Whilst walking, wheeling and cycling are in themselves healthy activities that are to be encouraged, it is when they displace car journeys that they deliver significant benefits for the health and well-being of Wales. Achieving modal shift by displacing private car journeys with walking, wheeling and cycling and public transport is at the heart of Llwybr Newydd, the Wales Transport Strategy.

1.1.2 Increasing levels of active travel contributes to the achievement of all seven of Wales' Well-being Goals. It was to reap these benefits that the then National Assembly for Wales passed the Active Travel Act (the 'Act') into legislation in 2013. The Act aims to make walking, wheeling and cycling the most natural and normal way of getting about. For this to happen, many more people will have to choose walking, wheeling and cycling as a means of transport. The provisions of the Act therefore put in place the conditions that will allow many more people, whose current mode of travel is the car, to switch to more sustainable modes for shorter journeys and facilitate access to public transport as part of longer distance journeys.

1.1.3 The definition of an active travel journey therefore includes walking, wheeling and cycling to travel to work, school and other educational facilities, the shops, leisure facilities, public transport interchanges and so on. The definition of an Active Travel Route excludes facilities for purely sporting use, such as an off-road circuit or mountain bike trail. However, this would not exclude an Active Travel Route that provides access to such a facility.

1.1.4 In practice, however, the best active travel routes will also be widely used for recreation. While the aim of the Act is to promote walking, wheeling and cycling as a mode of transport, the Welsh Government also strongly supports recreational walking, wheeling and cycling and sport. Walking, wheeling and cycling for leisure is strongly linked to a person's willingness to travel actively. A high level of recreational walking, wheeling and cycling on a route is an indicator of a high-quality route and should be considered a sign of success. However, such usage is secondary; active travel resources should only be invested in routes likely to produce modal shift and/or improve conditions for existing active travel users.

1.1.5 When compared with many other European countries, levels of active travel in Wales are low. The main barrier to more people taking up active travel is the perception of danger from motorised transport. Overcoming that perception is key to the success of the Act. Unless people can be persuaded that their entire journey can be made safely via active means, potential users of active modes will be discouraged, leading to continued reliance on the car.

1.1.6 The number of active journeys people will make, will depend on how comprehensive the network of safe routes is and how well the routes connect to/from key destinations, public transport infrastructure, and people's homes.

In September 2023, the Welsh Government introduced a default 20mph speed limit on restricted roads across Wales, becoming one of the first countries in the world to legislate this change.

Restricted roads are usually in residential and built-up areas where there are large numbers of people. They often have streetlights on them, placed no more than 200 yards apart, and historically had a 30mph speed limit.

The Welsh Government introduced the 20mph limit to:

- reduce collisions and serious injury, easing pressure on NHS services.
- encourage more people to walk, wheel and cycle in our communities.
- improve our health and well-being.
- make our streets safer for all.

The introduction of the 20mph speed limit is anticipated to lead to a number of benefits for people walking, wheeling and cycling including:

- Lower speed limits could have positive consequences on a range of important outcomes (such as safety, improve opportunities for people in crossing roads and potentially leading to beneficial physical and mental health consequences).
- Perceived safety and community cohesion: lower speeds can overcome real and perceived dangers that may make places more attractive and enhance community cohesion and interaction.
- Air quality: lower speeds have the potential to encourage walking, wheeling and cycling leading to decreased reliance on private motor vehicles (in turn leading to less pollution and improved air quality).

The default 20mph speed limit in built up areas should improve our communities for people walking and wheeling as well as the conditions for on-road cycling. Subject to real-world assessments, this could allow for low-cost expansions of the ATNM network. See **chapter 4** for further details on the ATNM.

1.2 The Act and this guidance

1.2.1 The guidance is issued using the powers of the Welsh Ministers to give guidance under sections 2(6), 2(9), 3(4), 4(5), 5(2), 7(2), 10C and 12(1) of the Active Travel (Wales) Act 2013. For ease of reference, throughout this document it will be known as ‘this guidance’.

1.2.2 This document is published by the Welsh Government for use throughout Wales and the contents must be considered when planning, designing and maintaining active travel routes and related facilities, enhancing provision for people walking, wheeling and cycling as part of other highway schemes (including planned maintenance work), or when considering the needs of people walking, wheeling and cycling as part of new developments, traffic management and road safety schemes.

1.2.3 **The advice in this guidance represents current accepted approaches and best practice. However, the document will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.**

1.2.4 The Act requires local authorities in Wales to produce maps of walking, wheeling and cycling networks, and to deliver year on year active travel improvements along the mapped routes and their related facilities (toilets, cycle parking etc.). These routes should be coherent, direct, safe, comfortable and attractive. The maps are now known as Active Travel Network Maps (ATNM) – showing existing routes and future routes which should combine the Existing Routes Map and the Integrated Network Map required by the Act. Full details of the ATNM requirements are provided in chapter 10 along with an explanation of the terms future routes and existing routes.

1.2.5 As well as creating the infrastructure, the Act includes provision for making people aware of the existing and future routes through the publication of the maps and for the promotion of active travel as a means of transport, and the Environment (Air Quality and Soundscapes) (Wales) Act 2024 amended the Active Travel (Wales) Act 2013, introducing with Section 10A a new duty to promote active travel specifically as a way of reducing or limiting air pollution.

1.2.6 The Act requires highways authorities in Wales to make enhancements to routes and facilities for people who walk, wheel or cycle in all new highway schemes and to have regard to the needs of people who walk, wheel or cycle in a range of other highway authority functions, such as maintenance.

1.2.7 Further details of the duties outlined within the Act are found in chapter 2 and the full text of the Act is available here.

1.2.8 This guidance is split into two parts:

Part 1: provides an outline summary of the aims, processes and key considerations associated with the Act. Part 1 signposts to relevant chapters of this guidance as an aid for the various partners who will be involved in the implementation of the Act, but who may not require detailed technical information on active travel design.

Part 2: provides detailed technical advice on how infrastructure should be planned and designed. All personnel involved in highway planning and design will need to be familiar with both parts, but particularly with part 2.

Throughout this guidance different verb forms are used to make a distinction between statutory requirements and advice. '**Must**' indicates a legislative or regulatory agreement; '**should**' indicates advice expressed as a recommendation and '**may**' indicates advice expressed as a permissible approach.

The terms '**absolute minimum**' (or maximum) and '**desirable minimum**' (or maximum) are used throughout this technical guidance. Desirable values are the minimum level for best practice provision which should be provided whenever possible. Absolute values should only be used if there are no viable alternatives and only for short sections. In both cases, the designer shall keep an audit trail of decisions made to justify why the best practice level of provision cannot be provided (see **appendix L**). Any proposed infrastructure outside absolute values should seek a discussion with Welsh Government and Transport for Wales Active Travel Hub before it is proposed.

1.2.9 Local authorities must have regard to this guidance under sections 2(6), 3(4), 4(5), 5(2), 7(2), and 10C(4) of the Act, when exercising the functions to which this guidance relates. All references to local authorities are to be taken as references to city, county and county borough councils. In line with the duties of the Act, this guidance is for all parts of the local authority, not just in its capacity as the local highway authority. Corporate Joint Committees need to have regard to this guidance when undertaking relevant duties on behalf of local authorities. This guidance will also be of relevance to anyone involved in the planning, delivery, monitoring, evaluation, promotion, maintenance or campaigning of/for active travel.

1.2.10 The implementation of local authority's duties under the Act will require effective collaboration amongst departments. An understanding of the responsibilities of each department is therefore key. These are set out within the table below using generic functions (rather than specific names which may differ between authorities). All departments will need to be aware of the overall aims of the Act as there may often be overlap between departments, for example, in planning and designing active travel access to a new school. This table also applies to Welsh Government.

Table 1.1: Function and area of relevance

Function	Area of relevance	Chapter/section	
		Part 1	Part 2
Corporate services and estate management	Equalities	3.4	
	The duties on local authorities	2.1	
	Definitions	1.3	
	Publishing the maps	4.10	
	Cross-boundary route planning with neighbouring authorities		7.4 10.2 10.4
	Promoting active travel	5	
	Stakeholder participation, engagement and consultation	5	
	Inclusive design		9 10
	Prioritising and delivering the active travel schemes		10.5
	Monitoring	6	

Function	Area of relevance	Chapter/section	
		Part 1	Part 2
Education	Children and young people	5.1	
	Learner travel measure	3.7	13.2
	Consultation/engagement	5	
	Promoting active travel	5	
	Active travel map consultation	5.1	
Youth services	Children and young people	5.1	8.4
	Consultation/engagement	5	
	Promoting active travel	5	
Social services	Equalities	3.4	9
	Consultation/engagement	5	
Planning, growth and regeneration	Planning Policy Wales	3.4	
	Planning status of the Active Travel Network Map	4	7 10.2
	Funding the network – s106 and CIL		10.2
	New developments		7.6
	Inclusive design		9 10
	Network planning		10
	Cross-boundary route planning with neighbouring authorities		7.4 10.2 10.4
	Integration with public transport		13
	Street furniture and cycle parking		14
	Construction, maintenance and management		15
Developing control and conservation	Environment Act	3.7	
	Planning Policy Wales	3.4	
	Planning status of the Active Travel Network Map		7 10.2
	Funding the network – S106 and CIL		10.2
	New developments		7.6
	User needs		9
	Street furniture and cycle parking		14
	Construction, maintenance and management		15
Environmental health	User needs		9

Function	Area of relevance	Chapter/section	
		Part 1	Part 2
Highways and transportation – all of the guidance is relevant. Staff not directly involved in active travel need to be particularly aware of the sections listed here:	Provision for people walking, wheeling and cycling when changes are made to the highway		7
	User needs		9
	Network planning		10
	Cross-boundary route planning with neighbouring authorities		7.4 10.2 10.4
	Designing for walking, wheeling and cycling		11 12
	Integration with public transport		13
	Creating, improving and managing highways		15
	Cycle and pedestrian traffic at street works and construction sites		15
Public health	Promoting active travel	5	
	Prioritising and delivering the active travel schemes		10.13
Recreation and tourism	Publishing the map	4.10	
	Promoting active travel	5	
	General provisions for traffic regulation and traffic regulation in special cases		7
	Integration with public transport		13
	Signs for people walking, wheeling and cycling		14

1.2.11 The duties of the Act relate to local authorities and Welsh Ministers, but National Park Authorities, Public Services Boards and Corporate Joint Committees with their strategic, cross-service remit, as well as Welsh Government supported bodies, such as Transport for Wales, Natural Resources Wales, Cadw, Public Health Wales and Sport Wales all have the potential to fulfil an important role at the local level in championing and overseeing active travel delivery across partners' activities.

1.2.12 Corporate Joint Committees are responsible for regional transport planning in each of the four regions and have an important role in prioritising transport schemes for delivery. They therefore fulfill an increasingly important, if non-statutory function, in the implementation of the Act.

1.2.13 The Welsh Government provides funding for a variety of large investment schemes under programmes such as Sustainable Communities for Learning and for NHS projects. These types of schemes are important trip generators.

1.2.14 The quality of provision for walking, wheeling and cycling access for staff and pupils, or staff, patients and visitors respectively should be considered in all education and health related projects which bid for Welsh Government capital and revenue funding. This consideration will form part of the scrutiny and appraisal process of each proposal.

1.2.15 Whilst the Local Authority generally acts as the local Highway Authority (and therefore the duties within the Act refer to the Local Authority), Community and Town Councils may also be able to facilitate active travel. Where applicable, Town and Community Councillors should therefore be familiar with the overall aims of the Act.

1.2.16 This guidance will be reviewed and updated based upon feedback from local authorities of their experience fulfilling their duties under the Act, and the usefulness of this guidance in supporting them, as well as feedback from other stakeholders. Comments and views on this guidance can be sent to: activetravel@gov.wales

1.3 Definition of an active traveller within the Act – walkers, wheelers, cyclists and other highway users

1.3.1 The term “walker” as used in the Act, (or within this guidance also person walking) embraces not only those who travel by foot (walking or running), but also users of wheelchairs and other mobility aids. To make this clearer, we explicitly talk about walking, wheeling and cycling throughout this guidance, however, direct quotations from the Act or other documents might not be so explicit. In certain circumstances the term “pedestrian” will encompass people who wheel, for example, in terminology such as pedestrian signal, crossing, flow.

1.3.2 The term “wheeler” and “people wheeling” refers to someone using a manual or powered wheelchair, mobility scooter or other mobility aid that is permitted on footways and other areas designated for pedestrians. People who wheel may however also choose to use cycling infrastructure, due to considerations of speed and infrastructure quality.

1.3.3 “Person cycling” and “cyclist” refers to users of pedal cycles, but not motorbikes. This definition of cycling includes e-cycles (also called electric assisted pedal cycles, electric cycles or pedelecs). They are referred to within this guidance as e-cycles. These are cycles where electric motors assist the cyclist by providing extra power to the pedals, making it easier to cycle. They are distinct from electrically powered motorbikes, where the motor provides all propulsion. Non-standard cycles, such as adapted cycles (cycles or tricycles specially adapted for use by disabled people), cargo cycles and recumbents are also included within the definition of cycling.

1.3.4 Micro-scooters, roller blades, skateboards and other similar modes of travel are not included in the statutory definition of active travel. However, these modes of travel can complement walking, wheeling and cycling. For example, scooters are widely used by children for travel to school. Their use should not be discouraged or impeded when they provide an attractive form of transport. E-scooters are a fast developing form of transport, the use of which is currently illegal on public roads and paths in the UK, unless as part of a formal trial. Inconsiderate use of micro-scooters, skateboards and similar can negatively impact disabled people particularly people with sight loss. Awareness raising and the potential conflicts should be included in active travel related training given to young people and through other promotional activities.

1.3.5 Walking, wheeling and cycling are brought together in the Act because they share a number of characteristics. However, that does not mean they can be treated the same. The cycle is a machine that can travel at speed which makes it an ideal replacement for the motor car for many journeys, but it also means that it can be unsuitable for sharing provision with people walking and wheeling in many contexts. Part 2 contains further advice on appropriate and desirable provision for certain scenarios.

1.3.6 Forms of equestrian travel (horse riding, carriage driving, pony and trap etc.) are rarely used as a mode of transport and are not considered forms of active travel under the Act. However, in delivering the provisions of the Act, local authorities should be aware that equestrians are vulnerable road users and should not restrict equestrian access to routes that they currently enjoy. Bridleways can be used by equestrians, walkers, wheelers and cyclists and so may form part of an active travel route. Enhancements to bridleways should not impede equestrian use or require them to use a less safe route instead. In some cases, it may be more appropriate for all users if separate provision is made for walkers and wheelers, cyclists and equestrian users. Where active travel routes are planned on an alignment for which there is also high demand from horse riders, the feasibility of accommodating them should also be assessed.

1.4 Other definitions

1.4.1 A range of definitions included within this guidance are provided within the accompanying glossary.



Chapter 2: The duties on local authorities and Welsh Ministers

This chapter summarises the duties of the Active Travel Act.

In preparing, consulting upon, publishing, submitting, reporting on and revising their Active Travel Network Map, in accordance with this guidance, local authorities will discharge their duties under the Act to prepare, consult upon, publish, submit, report on and revise their Existing Routes Map and Integrated Network Map as defined in the legislation (now referred to as the ATNM).

Additional duties that must be acted on by both local authorities and Welsh Government are to take reasonable steps to enhance the provision made for people walking, wheeling and cycling and to have regard for their needs when developing highway schemes.

2.1 The duties under the Active Travel (Wales) Act 2013

2.1.1 The duties arising from the Act apply to the whole local authority and entire Welsh Government and are not specific to any one department. Table 1.1 includes a guide to which parts of this guidance are particularly relevant to specific government functions.

2.1.2 Key duties of the Act are as follows, with the relevant section of the Act given in brackets:

- for local authorities to produce maps of existing active travel routes and related facilities in a local authority's area and of the future active travel routes and related facilities needed to create integrated networks for active travel in a local authority's area, and to submit these maps to the Welsh Ministers for approval within a prescribed timetable (section 3 and 4).
- requiring local authorities to have regard to the integrated network map in preparing transport policies and to ensure that there are new and improved active travel routes and related facilities (section 6).
- requiring the Welsh Ministers (section 8) and local authorities (section 3) to report on levels of active travel.
- requiring the Welsh Ministers and local authorities, in carrying out certain functions under the Highways Act 1980, to take reasonable steps to enhance the provision made for people walking, wheeling and cycling and to have regard of their needs in the exercise of certain other functions (section 9).
- requiring the Welsh Ministers and local authorities to exercise their functions under this Act so as to promote active travel journeys and secure new and improved active travel routes and related facilities (section 10).

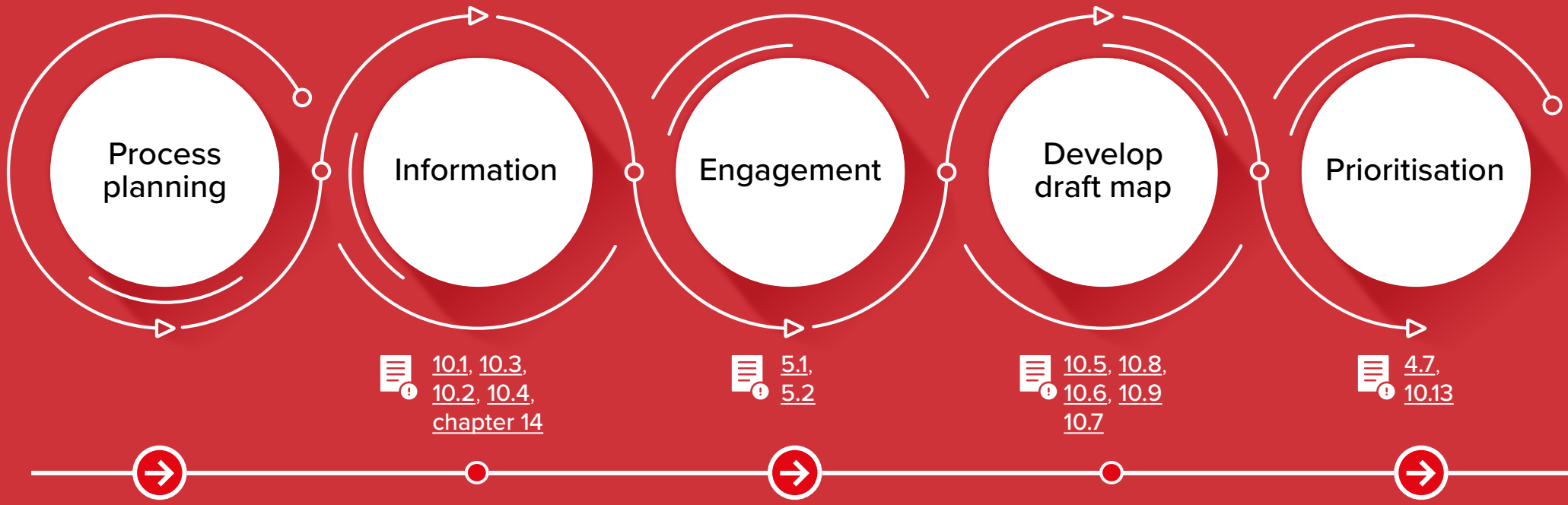
2.1.3 This guidance explains what these duties mean in practice and advises the Welsh Ministers and local authorities on how to meet these duties. Appendix A sets out the powers and duties that were created by the Act, and the bodies affected by the powers and the duties.

2.1.4 Local authorities should all prepare an ERM/INM (now known as Active Travel Network Map – ATNM) which incorporates the Existing Routes Map, with its associated facilities and statements, and the Integrated Network Map required by the Act. Welsh Government's Data Map Wales system enables local authorities to compile the ATNM and allows the two types of routes to be differentiated.

2.1.5 Part 1 introduces the basic requirements for local authorities and the Welsh Ministers under the Act. Part 2 provides further details on the delivery methods for these requirements.

2.1.6 The process local authorities are to follow in preparing their Active Travel Network Maps is set out in figure 2.1. The corresponding section of guidance is given within the table for where full details of each step of the process can be found.

Figure 2.1: Summary of ATNM preparation process



- Assess resources and time needed.
- Develop engagement plan.
- Assess local priorities.
- Consider equalities requirements.
- Consider how to integrate with programmes across authority departments, particularly highway maintenance, and relevant local and national plans.
- Review systems for working on routes that cross authority boundaries.

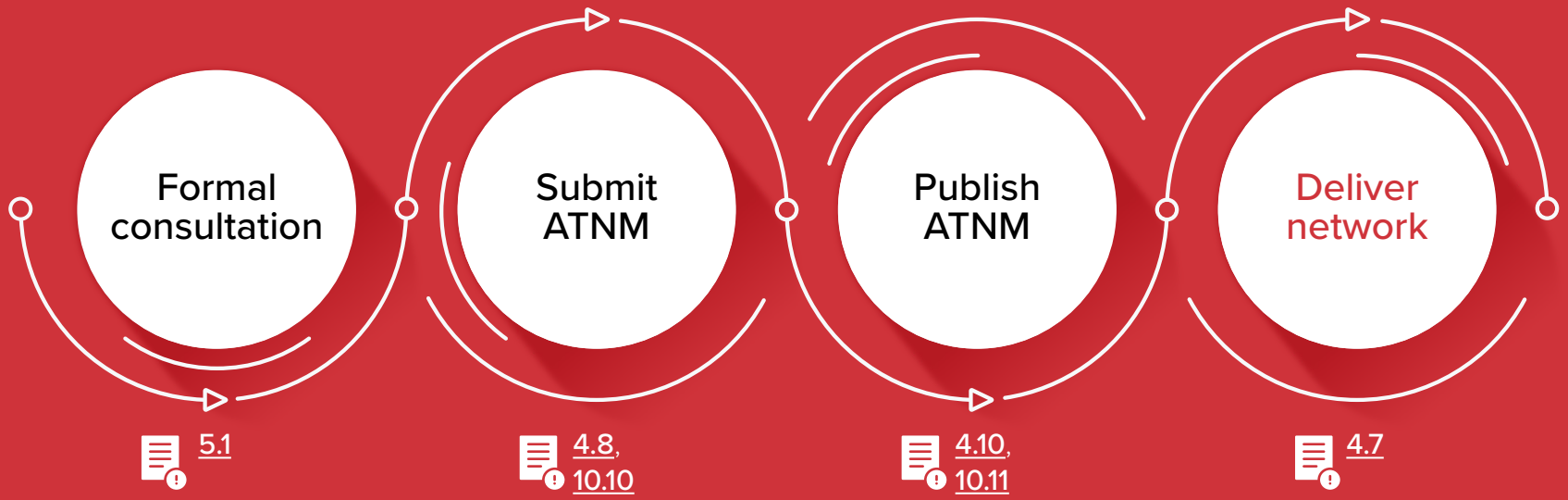
- List of key destinations.
- Identify where local short trips are taking or are likely to take place.
- Identify barriers that impact on active travel uptake for these trips.
- Identify new developments.
- Access sources of data.
- Check for demand for routes outside of designated localities.
- Review facilities to be included on the map.

- Implement engagement plan by contacting stakeholders and members of the public.
- Ask people to identify gaps in the network to serve their utility journey needs.
- Use a variety of engagement methods appropriate to each stakeholder group.

- Audit existing routes using audit tools (**appendix H**).
- Identify future routes and improvements to existing routes.
- Draw on data collected in previous information gathering stage.

- Determine which routes are most likely to deliver priorities and Welsh Government's priority of maximising the number of active travel journeys.
- N.B. route prioritisation can be an iterative process undertaken before and after statutory consultation.
- Local authorities can use the Transport for Wales (TfW) Prioritisation Tool to assess the relative priority of routes based on their potential impact on modal shift.

Figure 2.2: Summary of ATNM preparation process continued



- Undertake 12 week statutory consultation process.
- Ensure compliance with Equality Act 2010.
- Follow locally determined procedures for cabinet/scrutiny committee approvals.

- Submit ATNM to Welsh Ministers.
- Also send associated reports;
  - engagement and consultation report.
  - scheme prioritisation.

- Publish the approved ATNM along with route statements and prioritisation table.

- Deliver network in accordance with prioritisation plan.
- Promote network.

2.2 Duties for provision for people walking, wheeling and cycling when changes are made to the highway

2.2.1 As described within the Act, certain duties are placed on Welsh Government and local authorities when fulfilling functions that have an impact on transport networks and related infrastructure.

2.2.2 The Act requires that, as highway authorities, local authorities and the Welsh Ministers must take reasonable steps to enhance the provision made for people walking, wheeling and cycling in their exercise of functions under Parts 3, 4, 5, 9 and 12 of the Highways Act 1980 as far as it is practicable to do so. Chapter 7 sets out the full statement of duties in relation to the Highways Act that must be followed.

2.2.3 The Act also requires that highway authorities have regard to the needs of people walking, wheeling and cycling in exercising their functions under Parts 1, 2, 4 and 7 of the Road Traffic and Regulation Act 1984, Part 3 of the New Roads and Street Works Act 1991 and Part 2 of the Traffic Management Act 2004.

Case Study

Example 1: when undertaking routine road resurfacing works, local authorities must take the opportunity to include features that improve conditions for people walking, wheeling and cycling for example installing dropped kerbs where they are absent, or making changes to road markings to favour walking, wheeling and cycling movements.

Example 2: Welsh Government were developing a road improvement scheme at Junction 19 on the A55 between Glan Conwy and Llandudno Junction to address safety concerns on the roundabout by installing traffic signals and localised widening and markings, whilst also upgrading the surfacing and lighting. The existing footways on the roundabout were sub-standard and provided no controlled crossings over the slip roads or across the linking county roads.

Active travel was considered as part of the WelTAG process and the opportunity to enhance active travel provision and reduce community severance arose as part of the process. Further engagement with the local community, local authority and active travel users groups took place which led to several design enhancements and the final scheme was opened.

The scheme provides safe, active travel provision and crossing facilities through the junction, linking the north and south into existing local authority active travel routes, some of which will also be enhanced in the near future.





2.3 Review of the Act

2.3.1 The Welsh Ministers are required to review the Act no later than five years after the deadline for the production of the first integrated network map (now the ATNM). This review must assess the success of securing new active travel routes and related facilities and improvements of existing active travel routes and related facilities. It will also assess progress in encouraging more people to walk, wheel and cycle more often and the lessons learnt during the delivery of the legislation.



Chapter 3: Policy and legislative context

This chapter outlines key policies and legislation that relate to the enabling and promotion of active travel in Wales. Since the making of the Active Travel Act, the policy and legislative framework for active travel in Wales has been strengthened through the emergence of significant new and revised policies and laws and these must be considered in parallel with the Act when developing active travel routes and facilities.

3.1 Introduction

3.1.1 Since its introduction in 2015 the Well-being of Future Generations (Wales) Act has dramatically changed the work of public bodies in Wales. Through this, it has broadened both the scope and the approaches taken to how we must plan and deliver for active travel in Wales. Most recently Llwybr Newydd, the current Wales Transport Strategy has set a new direction for transport across all modes. It has been strongly shaped by the need to transform our transport system to help meet the Welsh Government's binding net zero carbon target by 2050.

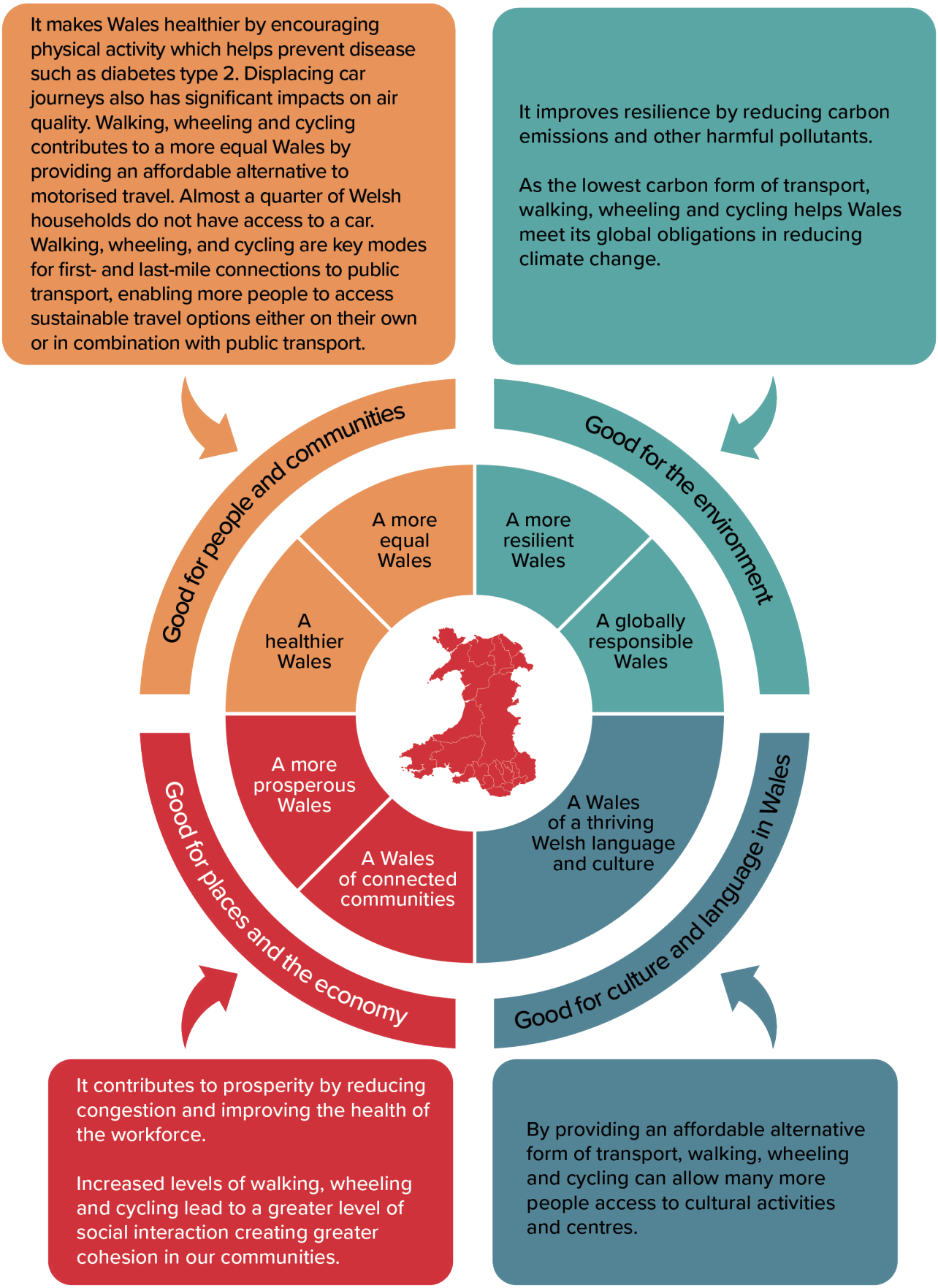
3.1.2 Planning Policy Wales and Future Wales, the new National Plan have significantly strengthened the alignment between transport and planning objectives further in their enhanced recognition of the role active travel plays in sustainable placemaking. This will affect the planning of large scale new developments and also how schemes within existing built up areas are considered. The Equality Act has been in place since 2010, and the understanding of how it needs to be reflected in our planning and design and the tools available to do so continue to improve. At the end of the chapter we summarise other laws and policies and how they relate to active travel.

3.2 Well-being of Future Generations (Wales) Act 2015

3.2.1 The Well-being of Future Generations Act applies to devolved public bodies in Wales, and aims to improve the social, economic, environmental and cultural well-being of Wales through seven well-being goals. Active travel can contribute to all of these goals (see figure 3.1).

3.2.2 The Well-being of Future Generations Act also sets out 'five ways of working' that must guide how public sector organisations work towards these objectives. These are: **Involvement** – **Integration** – **Prevention** – **Collaboration** – **Long-term**.

Figure 3.1: How active travel contributes towards meeting the well-being goals



3.3 Llwybr Newydd – The Wales Transport Strategy

3.3.1 Published in 2021, Llwybr Newydd sets out the vision for an accessible, sustainable and efficient transport system in Wales. Within the strategy there are separate mini-plans relating to specific aspects of transport including active travel. While direct quotes from the Act refer to 'walking and cycling', this guidance adopts the more inclusive term 'walking, wheeling and cycling'. The vision for active travel is therefore mainstreamed at the highest level of transport strategy:

"In line with the Active Travel (Wales) Act we want walking and cycling to become the normal choice for shorter journeys, because active travel is better for our health, our environment and the economy."

Llwybr Newydd has three headline priorities, which are further expanded in the mini-plans. The priorities will be reviewed as circumstances and technology change.

- Priority 1: We will plan ahead for better physical and digital connectivity, more local services, more home and remote working and more active travel, to reduce the need for people to use their cars on a daily basis.
- Priority 2: We will actively aim to achieve a shift away from private car use to more sustainable transport modes for the majority of journeys. We will invest in low carbon, accessible, efficient and sustainable transport services and infrastructure that enable more people to walk, cycle and use public transport, and low-emissions vehicles.

  We will provide safe, accessible, well-maintained and managed transport infrastructure. We will also future-proof it to adapt to climate change and facilitate more sustainable transport choices. Where we need new transport infrastructure, we will use the Sustainable Transport Hierarchy to guide decisions.
- Priority 3: We will encourage people to change their travel behaviour to use low carbon, sustainable transport.

3.3.2 When we invest in transport infrastructure and services, we will use the sustainable transport hierarchy to give priority to walking, wheeling and cycling and public transport ahead of private motor vehicles.

3.3.3 The active travel mini-plan in Llwybr Newydd sets out how the five ways of working should be applied when planning and designing interventions and schemes to increase active travel.

Figure 3.2: Llwybr Newydd vision and priorities

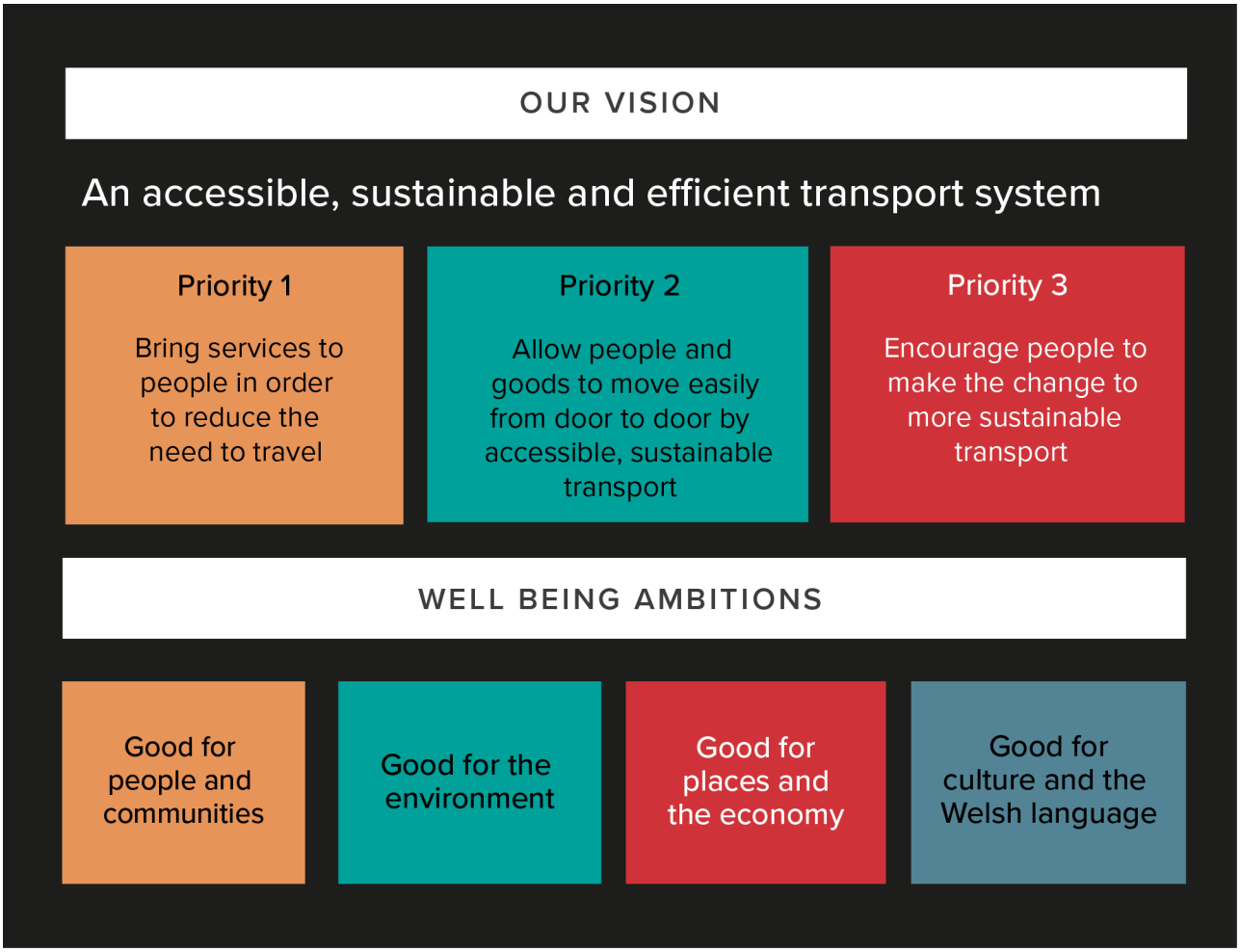
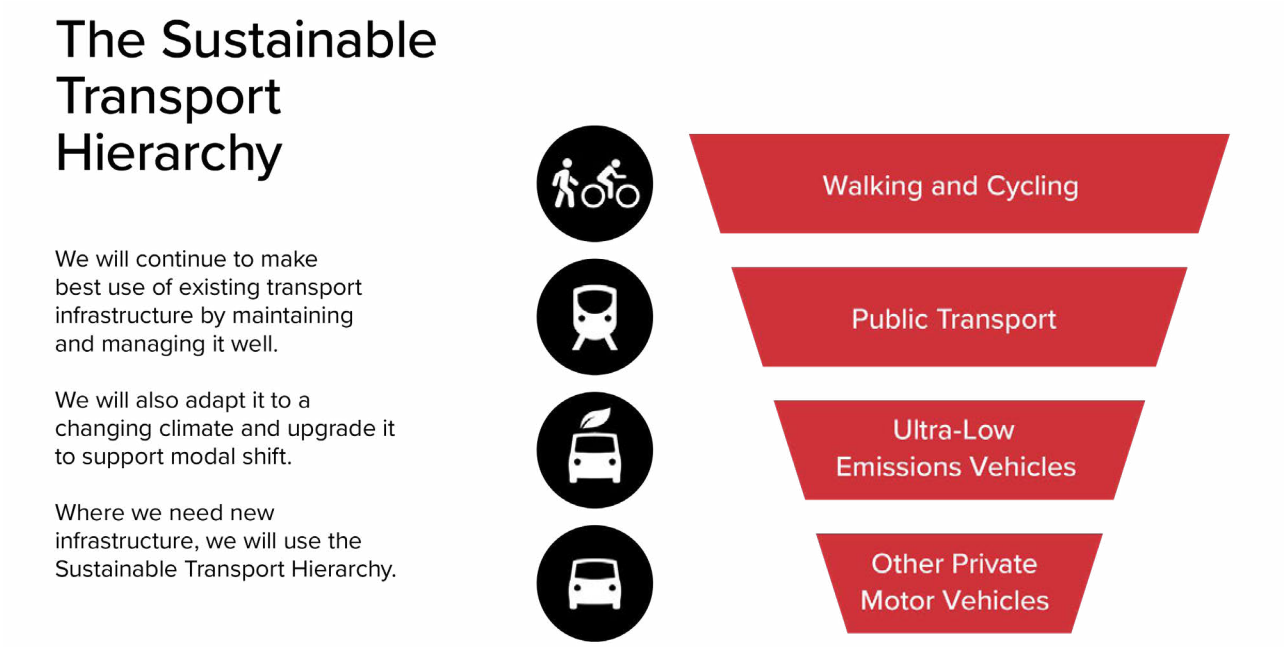


Figure 3.3: Llwybr Newydd sustainable transport hierarchy



3.4 Equality Act (2010)

3.4.1 The Active Travel Act should be implemented in such a way that it enriches the lives of as many people as possible. Developing a transport system that is not so heavily dependent on the private car and that integrates walking, wheeling, cycling and public transport effectively can bring great benefits to everyone. However, this potential will only be realised if the needs of people with protected characteristics and those from lower socio-economic backgrounds, particularly disabled people, are properly considered at all stages of creating the network and they, and their representative organisations, are properly involved in engagement and consultations. Under the Equality Act there are nine protected characteristics:

- age.
- disability.
- gender reassignment.
- marriage and civil partnership.
- pregnancy and maternity.
- race.
- religion or belief.
- sex.
- sexual orientation.

3.4.2 Section 149 of the Equality Act 2010 introduced the Public Sector Equality Duty requiring that a public authority must, in the exercise of its functions, have due regard to the need to:

a) eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under the Equality Act.

b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it.

c) foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

3.4.3 The Equality Act 2010 (Statutory Duties) (Wales) Regulations 2011 establishes specific duties for public authorities in Wales to support the implementation of the Public Sector Equality Duty and ensure compliance with that duty. They are supported by Technical Guidance published by the Equality and Human Rights Commission, which provides practical approaches to complying with the Public Sector Equality Duty. The document provides an authoritative, comprehensive and technical guide to the detail of the law including the need for equality plans, objectives and impact assessments.

3.4.4 To ensure duties undertaken in line with the Active Travel Act comply with those of the Equality Act (2010), Equality Impact Assessments (EqIAs) should be carried out throughout the process. This requirement applies to both specific scheme development, and any related activities such as engagement, consultation and promotional activities.

3.4.5 Under the Equality Act 2010, Local Authorities and other public bodies have an anticipatory duty to identify common barriers faced by disabled people and to take reasonable steps to address them, including adjustments to the built environment.

3.4.6 Local authorities should seek to establish a dialogue with organisations representing people with protected characteristics, as part of developing a clear understanding of local needs, circumstances and opportunities. See chapter 5 for further guidance on engagement and consultation.

3.4.7 Local authorities should also seek to engage with groups that are less likely to undertake journeys by active modes. Previous studies have found that women, older people, disabled people and people from Black, Asian and Minority Ethnic backgrounds are under-represented in uptake of active modes, in particular cycling.

Table 3.1: Actions to help overcome the common barriers to active travel, for protected characteristic groups

Protected characteristic linked to uptake of active modes	Evidence and barriers	Actions to overcome
Sex	Walk Wheel Cycle Trust 'Walking and Cycling Index' 2025 found that only 9% of women cycle at least once a week, compared to 20% of men. Women also make fewer walking trips, but the difference is less stark. There is evidence that women are more likely to be deterred from cycling by perceived dangers of cycling mixed with motor traffic. Women's journeys are more likely to be shorter than men's, use different modes of transport and involve multi-stop journeys, accompanied by children. There are also cultural and lifestyle issues that impact on women's propensity to walk, wheel and cycle. Walk Wheel Cycle Trust 'Walking and Cycling Index' found that while 48% of men think it is safe to cycle in their local area, only 41% of women did.	• Design strategies and plans to address, and be evaluated against, how they reduce inequality. • Increase diversity and representation in decision making and the transport sector. • Improve decision making through better evidence and public engagement. • Create better places for everyone to walk, wheel and/or cycle in (see chapter 9 for specific user needs). • Welcome and support all people to undertake active journeys, including: use of inclusive language and imagery. • Supporting a combination of behavioural and infrastructural interventions.

Protected characteristic linked to uptake of active modes	Evidence and barriers	Actions to overcome
Disability	Evidence suggest one third of disabled people in UK cities would like to start cycling. Barriers to transport and the wider built environment can restrict choice for disabled people when considering travel options.	• Design strategies and plans to address, and be evaluated against, how they reduce inequality. • Increase diversity and representation in decision making and the transport sector. • Improve decision making through better evidence and public engagement. • Create better places for everyone to walk, wheel and/or cycle in (see chapter 9 for specific user needs). • Welcome and support all people to undertake active journeys, including: use of inclusive language and imagery. • Supporting a combination of behavioural and infrastructural interventions.
Age	Walk Wheel Cycle 'Walking and Cycling Index' 2025 found that 47% of people aged 66+ walk or wheel at least five days a week compared to 56% of people aged 26-35. 9% of people aged 66+ cycle at least once a week, compared to 15% of people aged 26-35.	
Race	Walk Wheel Cycle Trust 'Walking and Cycling Index' 2025 found that 48% of people from ethnic minority groups walk and wheel at least five days a week, compared to 53% of people who are white, while the percentage of people that cycle at least once a week was 14% in both people from ethnic minority groups and people who are white.	

Further advice on how duties undertaken as part of the Act can incorporate and apply to the duties under the Equality Act are considered in further details within subsequent chapters of this guidance, specifically:

- Chapter 5 – relating to engagement and consultation and methods.
- Chapter 9 – relating to user needs.
- Chapter 10 – relating to planning a network.
- Chapter 11 – relating to route design.

3.5 Planning Policy Wales

3.5.1 Planning Policy Wales provides the policy framework for the effective preparation of local planning authorities' development plans as well as development management.

3.5.2 In conjunction with Planning Policy Wales, this guidance will support the masterplanning and layout and design of development sites, ensuring that all newly planned development is fully accessible by 'walking, wheeling and cycling'. This applies to private and public sector development, whether mixed use, housing, employment, or public services such as schools and hospitals. It relates to provision within the site and to connections between the site and nearby services, facilities and active travel networks.

3.5.3 Reducing reliance on the private car as a means of transport is a key part of the Planning Policy Wales (PPW) approach.

- It states: "The sustainable transport hierarchy should be used to reduce the need to travel, prevent car-dependent developments in unsustainable locations, and support the delivery of schemes located, designed and supported by infrastructure which prioritises access and movement by active and sustainable transport."
- It also makes clear that the planning system should support the Act: "The planning system has an important role to play in promoting and supporting the delivery of the Active Travel Act and creating the right environments and infrastructure to make it easier for people to 'walk and cycle', including new and improved routes and related facilities."
- It is clear on the importance of incorporating active travel into new developments: "Provision for Active Travel must be an essential component of development schemes and planning authorities must ensure new developments are designed and integrated with existing settlements and networks, in a way which makes Active Travel a practical, safe and attractive choice."
- And "Planning authorities must support Active Travel by ensuring new development is fully accessible by 'walking and cycling'. The aim should be to create walkable neighbourhoods, where a range of facilities are within walking distance of most residents, and the streets are safe, comfortable and enjoyable to walk and cycle."
- Furthermore, PPW recognises the importance of good infrastructure influencing transport behaviour: "Importantly, sustainable transport infrastructure and services should be prioritised and put in place from the outset, before people have moved in and travel patterns have been established."

3.6 Future Wales – the national plan 2040

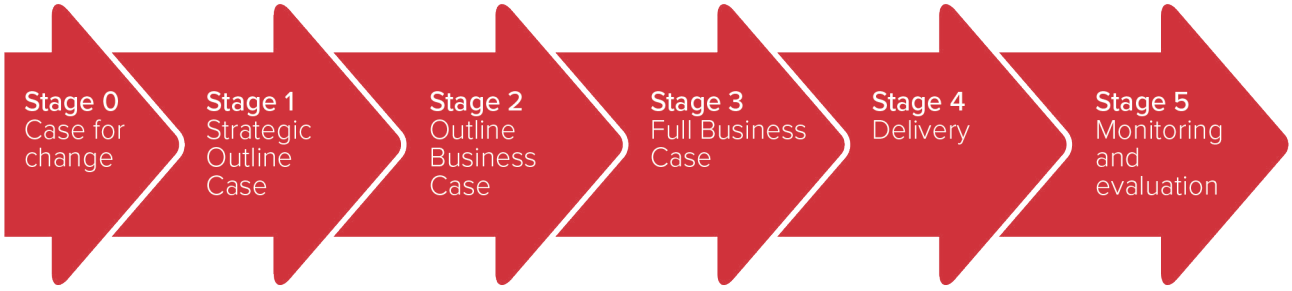
3.6.1 Future Wales sets out a spatial strategy that identifies at a strategic level how Wales should grow and change over the next 20 years. It provides a framework for delivering the infrastructure to support this growth and for ensuring that as places change, we must sustainably manage our most important natural resources.

3.6.2 The national plan sets out how growth should be shaped around sustainable forms of transport and places that make us and the environment healthier – enabling journeys to be undertaken using active modes is therefore integral to this vision.

3.7 WelTAG

3.7.1 WelTAG is a framework to assess the strategic case for proposed changes to the transport system. It contains best practice for the development, appraisal and evaluation of proposed transport interventions in Wales. WelTAG is recommended as the starting point whenever a problem is identified with the transport system or within another area that is affected by, or affects, the transport system. The WelTAG process must be applied to all transport projects funded in part or in full by the Welsh Government, and the process is developed over six stages as seen below.

Figure 3.4: The six stages of WelTAG



3.7.2 The ATNM process requires local authorities to take account of the views of stakeholders and of the evidence gathered to inform network planning when identifying existing and future active travel routes and related facilities. This work can inform the WelTAG process, including development of the Strategic Case, during the identification and preparation of scheme proposals.

3.7.3 Further details on the WelTAG principles and process can be found within the Welsh Transport Appraisal Guidance document.

3.8 Highway code

3.8.1 The highway code interlinks with this guidance as it establishes the rules for people driving, cycling, walking and wheeling, and road safety.

3.8.2 Some of the most relevant rules in this context are:

- Rule H1, which sets that people in charge of vehicles that can cause the greatest harm in the event of a collision bear the greatest responsibility to take care and reduce the danger they pose to others. This also includes people cycling and riding a horse (or a horse drawn vehicle) who have a responsibility to reduce danger to people walking and wheeling.
- Rule H2, which sets that at a junction, people driving, cycling or riding a horse (or horse drawn vehicle), when turning in or out should give priority to pedestrians crossing or waiting to cross. If there is a zebra crossing, the "should" in the previous sentence becomes a "must". It also sets that people cycling should give priority to people walking and wheeling on a shared use surface and to horse riders in a bridleway. People walking and wheeling may use any part of the footway, cycle track and carriageway, unless prohibiting signs are present.
- Rule H3, which states people driving should not cut across someone cycling or riding a horse when trying to turn at a junction, but they should stop and wait for a gap instead.

3.9 Other statutory considerations

3.9.1 Table 3.2 summarises other statutory considerations that should be taken into account when delivering duties under the Active Travel (Wales) Act. Methods to incorporate these into walking, wheeling and cycling schemes and planning are further explained in part 2, particularly chapters 11, 12 and 15.

Table 3.2: Other statutory considerations key to delivering the Active Travel (Wales) Act

Title	Overview	Relationship to active travel implementation	Who is this relevant to?
Flood and Water Management Act (2010)	This Act aims to reduce and mitigate the risk of flooding and erosion.	Local authorities must include sustainable drainage systems (if the development is 100 square metres of more). The Sustainable Drainage (SuDS) Statutory Guidance and standards which accompany the legislation, set out the requirements for the design, construction, operation and maintenance of sustainable drainage, which can be incorporated into active travel schemes. Further details are provided within chapter 8.	• Anyone developing an active travel route or related facility of more than 100sqm.
Transport (Wales) Act 2006	This Act sets out the duties of the Welsh Ministers in developing transport policies within Wales.	Provides the basis under which transport strategies/policies and plans are developed within Wales.	• Welsh Ministers. • Local transport authorities.
Technical Advice Note 24: The Historic Environment	This advice note provides Conservation Areas policies designed to preserve or enhance all the aspects of character or appearance that define an area's special interest.	Informs the design of walking, wheeling and cycling infrastructure in Conservation Areas.	• Local authorities.

Title	Overview	Relationship to active travel implementation	Who is this relevant to?
The Play Sufficiency Assessment (Wales) Regulations 2012	The Play sufficiency Assessment (Wales) Regulations sets out the duties on local authorities to complete a Play Sufficiency Assessment, Play Action Plans and other reports to Welsh Government officials.	The design and delivery of active travel projects can also help local authorities to fulfill their obligations to provide opportunities for play, for example through 'play on the way' initiatives. See chapter 8 for more information. The accompanying statutory guidance and toolkit provides guidance to local authorities on how they should fulfill these duties.	• Local authorities.
Environment Act (Wales) 2016	Seeks to ensure our natural resources are managed in a sustainable way.	Implementation of active travel can contribute to various parts of the Act, particularly Part 2: Climate Change. Section 6 introduces a duty that public authorities must seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in doing so promote the resilience of ecosystems.	• All public authorities. • Ideally, this will be considered at the earliest opportunity in a project to ensure it can be considered at the outset of any new active travel development, rather than risking costly changes to designs at later stages. • Welsh Government have produced guidance on how this can be considered as part of scheme development.

3.10 Other key relating strategies, frameworks and charters

3.10.1 The following table outlines policies, strategies and frameworks that support or should be considered when undertaking duties in line with the Act. This list is not exhaustive and care should be taken to consider additional relevant legislation and strategies, informed by specific circumstances.

Table 3.3: Other supporting strategies relating to active travel implementation

Strategy	Overview	Relationship to active travel implementation	Who is this relevant to?
20mph speed limit on restricted roads	In September 2023, the Welsh Government (WG) introduced a 20mph speed limit on restricted roads across Wales.	The policy aims to reduce collisions and serious injury, easing pressure on NHS services; encourage more people to walk, wheel or cycle in our communities; improve our health and well-being; make our streets safer for all.	• Welsh Ministers. • Local authorities. • Public.
Clean Air Plan for Wales: Healthy Air, Healthy Wales	Plan aims to improve air quality and reduce impact of pollution health, biodiversity, the natural environment and our economy.	Uptake in active modes can contribute to addressing a number of the aims within this plan.	• Those looking to justify and implement active travel improvements.
Low Carbon Delivery Plans	Set out how the Welsh Government will meet its legal commitment to achieve net zero emissions by 2050 through actions taken for the interim carbon budgets.	Mode shift to active travel reduces carbon emissions from transport.	• Welsh Ministers.
Action on Disability: The Right to Independent Living	A Framework and Action Plan setting out commitments and actions to remove barriers that stop disabled people from fulfilling their potential and achieving their ambitions based on the Social Model of Disability.	Sets out key commitments on working with disabled people to address barriers to inclusion including in the transport sector.	• Welsh Government commitments; other public service providers are encouraged to follow the commitments in the framework.

Strategy	Overview	Relationship to active travel implementation	Who is this relevant to?
Local Well-being Plans	These set out how the Public Services Boards in each area will meet their responsibilities under the Well-being of Future Generations (Wales) Act.	As this is directly linked to the Well-being of Future Generations Act, in the majority of cases, active travel can contribute towards achieving Local Well-being Objectives.	• All public service bodies involved in implementing active travel.
Healthy Weight, Healthy Wales	The obesity strategy for Wales sets out actions in four themes.	Active travel supports two themes: Healthy environment and Healthy setting; reducing obesity through building physical activity into everyday journeys.	• Welsh Ministers. • Public Health Wales. • Local authorities. • NHS Wales Public Service Boards.
LGBTQ+ Action Plan for Wales	This cross-government plan sets out the Welsh Government's vision to make Wales the most LGBTQ+ friendly nation in Europe. It aims to tackle discrimination, improve outcomes, and ensure that LGBTQ+ people can live authentically, safely, and freely.	The plan highlights the importance of inclusive public spaces and services. In the context of active travel, this means ensuring that walking, wheeling, and cycling infrastructure is designed to be safe, welcoming, and accessible for LGBTQ+ people – particularly those who may face harassment or exclusion in public spaces. Inclusive engagement and co-design with LGBTQ+ communities can help ensure that active travel routes and facilities meet diverse needs.	• All local authorities and organisations involved in implementing walking, wheeling and cycling infrastructure.

Strategy	Overview	Relationship to active travel implementation	Who is this relevant to?
Placemaking Wales Charter	Developed by Welsh Government and the Design Commission for Wales in collaboration with the Placemaking Wales Partnership. It aims to provide a common understanding of the range of considerations that go into placemaking. More information is provided in chapter 8.	The charter outlines six overarching placemaking principles which cover the range of considerations that contribute to establishing and maintaining good places including 'Movement' which states 'Walking, cycling and public transport are prioritised to provide a choice of transport modes and avoid dependence on motor vehicles'.	• All public bodies involved in implementing active travel.
Anti-Racist Wales Action Plan	The Anti-Racist Wales Action Plan is the Welsh Government's strategic commitment to becoming an anti-racist nation by 2030. It sets out a rights-based, evidence-led approach to tackling systemic racism and improving outcomes for Black, Asian, and Minority Ethnic communities across all sectors, including transport and infrastructure. The 2024 update strengthened delivery mechanisms and accountability, including the establishment of the Race Disparity Evidence Unit.	The plan emphasises equity in public service delivery, inclusive engagement, data-led approaches to addressing disparities, and embedding anti-racist principles across all sectors, which applies to planning, consulting and delivering walking, wheeling and cycling infrastructure.	• All local authorities and organisations involved in implementing walking, wheeling and cycling.

Strategy	Overview	Relationship to active travel implementation	Who is this relevant to?
Place Plans and Placemaking Plans in Wales	Place Plans are a collaborative effort between local communities and the Local Planning Authority (LPA). They offer guidance on local aspirations related to the land-use planning system. Placemaking Plans are locally led strategies, developed with local stakeholders that set out a spatial vision for town and town-centres across. They are a requirement for accessing funding from the Welsh Government's Transforming Towns Programme. More information is provided in chapter 8.	They should demonstrate how ATNMs integrate development and delivery of walking, wheeling and cycling schemes.	• All public bodies involved in implementing active travel.
Strategic Equality and Human Rights Plan 2025-2029	This plan sets out the Welsh Government's National Equality Objectives (NEOs) and a Human Rights Statement, forming a framework to tackle inequality and promote fairness across all areas of public life. Relationship to Active Travel Implementation: The plan reinforces the need for equity of access to services and infrastructure. For active travel, this means ensuring that walking, wheeling, and cycling routes are accessible to all.	Policy makers and planners aligning transport with equality objectives.	• All local authorities and organisations involved in implementing walking, wheeling and cycling infrastructure.



Chapter 4: Network principles and requirements

To meet the duties of the Act, local authorities must produce maps of existing active travel routes and related facilities in a local authority's area and of the future and improved active travel routes and related facilities needed to create integrated networks for active travel. These area maps are to be submitted to the Welsh Ministers for approval within a prescribed timetable. Local authorities also have a duty to make year on year improvements to their active travel routes and related facilities.

4.1 Introduction

4.1.1 As introduced in chapter 1, the purpose of the Act is to increase the number of people in Wales who walk, wheel and cycle for everyday purposeful journeys.

4.1.2 For this vision to be achieved, the Act sets out a process for local authorities to follow to create networks of active travel routes. The term network in relation to active travel means routes which join up, so that people can travel in a continuous and safe way between their origin and destination.

4.1.3 This chapter deals with the basic principles and processes required for developing the active travel network. The chapter also refers to the ERM/INM (now known as Active Travel Network Map – ATNM) in its function as a tool for planning the network as required by the Act. Further technical detail on actions required to deliver the network are provided in chapter 10.

4.2 Who the network is for

4.2.1 In conceptualising and planning the active travel network, local authorities should keep in mind the users who will benefit from it. Chapter 9 goes in to more detail regarding the specific needs of users in relation to infrastructure design. This section deals with the general principles of network development; the type of journey the network is designed to serve, typical distances people walking, wheeling or cycling can be expected to travel, and other considerations.

4.2.2 The active travel network is designed to serve everyday journeys. These are also known as utility journeys – trips with a purpose rather than purely for leisure. Examples of destinations which can be considered to form an everyday or utility journey include: school or other educational establishments, local shops, employment sites, healthcare facilities, and other destinations people travel to for a purpose. Destinations also includes public transport stops or interchanges, as many public transport journeys will start or end with people walking, wheeling and/or cycling.

4.2.3 Table 4.1 provides a guide for network development in relation to reasonable distances that would be travelled by each respective mode.

4.2.4 Table 4.1 is not descriptive of all active users and travel distances may be dependent upon a number of factors such as journey purpose, topography or suitability of route.

Please refer to the following key when using table 4.1:

- Green = Many users likely to travel this distance for utility journeys.
- Amber = Some users likely to travel this distance for utility journeys.
- Red = Few or no users likely to travel this distance for utility journeys.

Table 4.1: Typical distance range for each active mode that users are likely to travel

Mode	Less than 1 mile	Up to 2 miles	Up to 3 miles	Up to 4 miles	Up to 5 miles	Up to 7.5 miles	Up to 15 miles
Walking and wheeling	Many users	Many users	Some users	Few or no users	Few or no users	Few or no users	Few or no users
Cycling	Many users	Many users	Many users	Many users	Many users	Some users	Few or no users
E-bike	Many users	Many users	Many users	Many users	Many users	Some users	Some users

4.2.5 Two out of every three journeys are less than five miles in length[1] – an achievable distance to cycle for most people, with many shorter journeys also suitable for walking and wheeling. For school children the opportunities are even greater: three quarters of children live within a 15-minute cycle ride of a secondary school, while more than 90% live within a 15-minute walk of a primary school.

4.2.6 Perceived danger from road traffic is an often quoted as a key barrier preventing more people taking up walking, wheeling and cycling. The perceived safety of a journey will be determined by the whole route, with junctions in particular often being a reason for the entire journey being considered unviable for walking, wheeling or cycling.

4.2.7 Local authorities should seek to provide infrastructure that separates people to walk, wheel or cycle from motor vehicles where traffic volumes and speeds exceed those suitable for most people to consider a shared carriageway. Clearly, not all residential areas will be able to accommodate separate routes. In this case, the concept of the basic network should inform active travel network planning; quieter streets where the speed and volume of motor traffic allows active travellers to share space with motor vehicles without fear of collision (see table 11.1 and section 11.32).

4.2.8 A full definition of the basic network is given in chapter 10. Routes containing elements of the basic network should be included on the ATNM and may be eligible for Welsh Government funding. The extent of the basic network and the effectiveness of its design and delivery will be a major factor in attracting new people to walk, wheel and cycle. **The default 20mph roll out in built up areas should improve the conditions for on-road cycling which may now be present on some parts of the planned ATNM networks, but this needs to be assessed against real life conditions in each case.**

1 Walk Wheel Cycle Trust key walking and cycling statistics for the UK

4.2.9 As a general principle, the network should cater for children to travel independently, as a walker, wheeler or cyclist, from the age at which they start secondary school. The development of an active travel school plan (see Walk Wheel Cycle Trust Active Travel School Plans) may be a useful exercise to help focus efforts across infrastructural and behavioural interventions.

4.2.10 The active travel network is important to the many disabled people who cannot otherwise travel independently. Their needs should be considered at every stage of the design and development of the network, as outlined in chapter 9.

4.2.11 People who do not currently walk, wheel or cycle often are unlikely to be familiar with the location or direction of existing infrastructure especially if it has an alignment away from the highway. Clear wayfinding and signage, as well as promotion materials and activities should therefore be an integral part of the development of the network.

4.3 The Active Travel Network Map (ATNM)

4.3.1 The first of the duties under the Act, outlined within chapter 2, relates to the requirement for local authorities to map existing and plan future active travel routes. Local authorities need to produce Active Travel Network Maps (ATNMs) showing these routes and covering all designated localities within their areas (see 4.4 below).

4.3.2 The ATNM as a network planning tool enables a local authority to develop and maintain a strategic plan of all routes, whether a route currently exists and meets the required active travel design standards (an existing route) or not (a future route).

4.4 Designated localities

4.4.1 Under section 2(4) of the Active Travel Act, the Welsh Ministers are empowered to designate localities in a Direction. The duty to map routes is specific to those designated localities. This is to ensure that there are plans in place for the creation of active travel networks in all the most populous areas in each authority. It does however not limit an authority's ability to develop network maps for other localities, where there is demand for active travel routes and a high potential for their use. A schedule of designated localities by local authority area, can be found in appendix B.

4.4.2 Duties relating to promotion of active travel and making provision for people walking, wheeling and cycling in exercise of certain functions, including the new duty 10B added to the Active Travel (Wales) Act 2013 in 2024 to promote active travel as a way of reducing or limiting air pollution, apply to the whole of the local authority area (not only designated localities). The duty to improve provision for people walking, wheeling or cycling therefore applies to all developments and highway improvements within the local authority boundary and not simply those within the designated localities.

4.4.3 Connecting outlying communities to a nearby designated locality, and linking localities to each other and to key destinations, such as workplaces and transport hubs where the distance is suitable, is a core element of network planning. Routes serving these purposes should therefore be included on the ATNM even though they sit outside a designated locality. Funding for such routes can be applied for (provided there is clear evidence of potential for modal shift), however, the focus of the networks should be within the designated localities which are likely to have a higher impact.

4.4.4 Local authorities should liaise with neighbouring authorities to map active travel routes where there is demand to travel between authority areas. Local authorities who border English local authorities should also choose to map areas in England and work with authorities there to ensure an effective network (for example, integrating with relevant English Local Authorities' Cycling and Walking Infrastructure Plans).

4.5 Rurality

4.5.1 The isolated nature of communities, sparsity of services and the increased length of journeys will often mean that enabling active travel in rural areas requires a different approach to that for larger towns and cities. Some longer journeys may be more achievable by a combination of active travel and public transport, where this is available. In rural locations, local authorities may therefore want to prioritise walking, wheeling and cycling links to public transport services (bus stops and rail stations) (see chapter 13).

4.5.2 Adopting a more flexible approach to mapping routes that extend outside the designated localities may also be useful where the settlement is relatively close to a larger urban centre in which many of the services that attract local trips are located. The likely impact of these routes in terms of increased active travel journeys and potential for modal shift should be considered in the prioritisation process.

4.5.3 Where longer distance routes in rural areas are proposed, the length of the route should be considered carefully with reference to table 4.1 above. Such routes may also require the use or acquisition of land from a number of landowners which can impact scheme delivery timescales and so realistic project planning should consider all the potential challenges at an early stage, including the potential to use Compulsory Purchase Orders (CPOs).

4.5.4 E-cycles are becoming increasingly popular and affordable, enabling cycling for longer journeys or over more challenging hilly terrain and for wider population groups. Other than charging facilities, e-cycles require no additional infrastructure compared to other types of cycles. Local authorities may want to emphasise the potential of e-cycles in their promotion of active travel, in particular in rural or hilly areas.

4.6 Mapping of routes and related facilities

4.6.1 To ensure consistency across Wales, the ATNM should be created using the Welsh Government provided mapping system, Data Map Wales.

4.6.2 The primary purpose of showing the existing routes and related facilities on the map is to provide a visual representation of current routes that meet active travel standards and can be used for everyday journeys, as well as constraints where routes fall short of the guidance.

4.6.3 The future routes layer of the ATNM shows where routes are planned for improvement to bring them up to the standards, as well as entirely new routes that the local authority proposes to create in the future.

4.6.4 The ATNM must include existing routes suitable for people walking, wheeling and/or cycling as well as future proposed routes for walking, wheeling and/or cycling. Route suitability is determined using a standard set of criteria, which is introduced in chapter 10.

4.6.5 Publicly available related facilities, such as cycle parking and toilets (as defined within the Act) should also be shown on the ATNM, with caveats where access is not universal (see chapter 14).

4.6.6 In certain contexts, local authorities may wish to designate areas of high pedestrian footfall as prestige walking and wheeling zones within town or city centres – with an aim for all walking and wheeling routes covered within the area to meet active travel standards. Similarly, healthy neighbourhoods (described in chapter 11) can be designated across a wider area. Future development of Data Map Wales will allow these zones to be identified on the ATNM, whether existing or future.

4.6.7 Any physical barriers to active travel, such as a level crossing or steep gradients, should also be shown on the ERM/INM (now known as ATNM). Routes and facilities not covered under the Act and that do not meet active travel standards (such as an unsurfaced Public Right of Way) can be shown, but their presentation should be differentiated from the active travel network.

4.6.8 Further detail about the mapping of routes and related facilities (including advice on where statements are applicable and preparation of the map) is provided within chapter 10.

4.6.9 Welsh Government will offer a number of training opportunities to those involved in planning and delivering active travel networks during each map submission cycle. This will include training in using the mapping system as well as training in implementing this planning and design guidance.

4.7 Prioritisation and network coverage

4.7.1 Prioritisation is an essential element in the delivery of the Active Travel Act. The ATNMs are intended to show how the network will develop over a fifteen year period. Clearly not all routes can be developed at the same time. Similarly, not all routes will have the same impact on increasing the number of active travellers or achieving other local or national goals that can be facilitated by improving active travel infrastructure.

It is therefore important that local authorities have a clear plan for the prioritisation of routes, to help determine the order in which the routes should be developed or constructed and to demonstrate to the public and stakeholders the long term nature of the development of the network during the engagement and consultation process.

4.7.2 The factors used in assessing priorities can be determined locally based on addressing local needs and issues and taking advantage of opportunities such as new development or highway improvement plans. However, it should be noted that the extent to which priority has been given to routes that will maximise an increase in active travel will be a consideration for Welsh Ministers when allocating funding (section 10.13 provides detailed advice on prioritisation).

4.7.3 The construction of a comprehensive network may take many years. Its completion will be achieved through:

- direct investment in new and improved routes using funding specifically allocated to walking, wheeling and cycling schemes.
- the incremental integration of enhanced routes and facilities for walking, wheeling and cycling in the design of highway improvements and new highway schemes as required by the Act.
- any new or improved routes that are provided by new developments such as new housing, commercial, education and industrial sites (including any off-site highway improvement works within the development).

4.7.4 A well-developed and regularly updated ATNM will enable enhancements associated with new developments, highway improvements and traffic management schemes to be properly integrated into the delivery of future routes. This will significantly reduce the level of dedicated active travel funding required and possibly reduce the timeframes for completion of a comprehensive network.

4.7.5 Welsh Government expects to see incremental improvement to the density of networks each time an ATNM is submitted for approval by Welsh Ministers, with the aim of working towards a comprehensive network for each designated locality.

4.7.6 A comprehensive network is defined as where there is a distance of no greater than 250m between adjacent routes (either existing or future). This network coverage is known as ‘mesh density’ and is further explained in chapter 10. In assessing their mesh density, local authorities should consider the impact of the 20mph default speed limit on real-life conditions for cycling on the network, which should include highway environments were suitable.

4.7.7 These routes should connect all key destinations. This includes all current and planned schools within the designated localities and these should be included in all iterations of the ATNM. Where a school within a locality’s catchment area covers another designated locality within a reasonable distance (refer to table 4.1), routes should be mapped between these localities.

4.7.8 Chapter 10 provides detailed information about the prioritisation process and information on factors that can help within this process, including further explanation of the 'mesh-density' principles.

4.8 Map submission

4.8.1 The Act requires local authorities to submit their ERM/INM (now known as ATNM) to Welsh Ministers no later than three years after the date on which their previous map was last approved, though the Act gives Welsh Ministers the power to specify a different time period by issuing a direction. This may be to alter the submission date for all local authorities, or for individual authorities. The submission date may be earlier where local circumstances have changed and there is an urgent need for an alteration. Such a direction would normally be made at the request of the local authority and specify the area to be covered in the review and the date by which the next full review of the ATNM must be submitted.

4.8.2 Local authorities have a duty to consult on the ERM/INM (now known as ATNM) and shall submit a report of the engagement and consultation that they have undertaken in producing the Map alongside it, using the proforma supplied in appendix D. Principles for effective consultation and engagement are described within chapter 5.

4.8.3 When local authorities are ready to submit their ATNM and consultation report, they should notify Welsh Government by email and use the Data Map Wales system to generate and save a snapshot of their ATNM. Welsh Government will review the submitted maps directly on Data Map Wales.

4.8.4 It is important to note that routes not identified on a map approved by Welsh Ministers will not be eligible for Welsh Government funding.

4.9 Approval

4.9.1 In considering whether to approve the ATNM and supporting documents the Welsh Ministers are required to consider:

- whether the process set out in this guidance has been followed.
- whether appropriate consultation, in line with this guidance, has been conducted (further details in chapter 5).
- whether format of the existing routes and future routes layers follows this guidance.
- whether any statements provide suitable explanation for why routes that do not meet the required design standard are included as existing routes (if applicable).

4.9.2 They will also consider:

- whether the submitted ATMNs are ambitious enough to meet the objectives of the Act.
- the coherence of the network for serving everyday journeys by joining up destinations, rather than the quality of individual routes.

4.9.3 The Welsh Ministers may require local authorities to resubmit their ATNM if the authority has not consulted appropriately; has not had regard to this guidance as to the consultation and preparation of the map, including what should be shown on the map and its format; and/or if the explanation of the nature of the routes is insufficient. In such an event, the local authority will be provided with an explanation and asked to make appropriate amendments, before resubmitting by a date prescribed by the Welsh Ministers.

4.9.4 Welsh Ministers may decide to approve only the future routes or only the existing routes on a local authority's ATNM, where they consider that only one set of routes has met the requirements set out in this guidance. Only the approved set of routes may be eligible for funding. Where only one set of routes has been approved, the local authority must make appropriate amendments to the part of the ERM/INM (now known as ATNM) that was not approved before resubmitting in accord with section 4.8.

4.9.5 Welsh Government funding for active travel will only be granted for improvement of existing routes and construction of future routes that appear on the local authority's approved ATNM. In allocating funding, Welsh Ministers will take into account how local authorities have prioritised the improvement and expansion of their network to maximise an increase in active travel.

4.10 Publishing the map

4.10.1 The ATNM is important both for members of the public who do, or may wish to, undertake active travel journeys, but also for planning purposes for developers, other local authority departments and other third party partners who may want to use active travel route data for their services. The completed ATNM must therefore be publicly available as soon as reasonably practical, after the Welsh Ministers have agreed the draft sent to them for approval. Local authorities are encouraged to bring the ATNM to the attention of the local population and relevant bodies in an appropriate way for their area. Further suggestions for methods associated with promotion are provided within chapter 5.

4.10.2 Local authorities must:

- publish the ERM/INM (now known as ATNM) and any associated documents (such as statements and the list of prioritised routes) in a manner they consider appropriate.
- send a free copy to such persons they consider appropriate.
- supply a copy or a part of it, free of change or at the cost of providing the copy, to any person who requests a copy.
- bring to the attention of the public where copies are available.

4.10.3 To meet the requirements for publication local authorities should:

- make electronic copies of the ERM/INM (now known as ATNM) available on their website and ensure these are as accessible as possible.
- produce versions in any other languages considered appropriate as well as the versions in Welsh and English.
- make large print and tactile maps available on request.

4.11 Continuous improvement

4.11.1 Local authorities have a duty to make year on year improvements to their active travel routes and related facilities. Under this duty, local authorities are required to build new active travel infrastructure, as well as improve the existing infrastructure.

4.11.2 There are two ways that local authorities will demonstrate to Welsh Government that they have delivered this duty:

- through the revision of the ERM/INM (now known as ATNM). At the review point, there should be a measurable difference between the number and length of Existing Routes on the previous map and the new one.
- through their annual reports in which they set out the actions taken and the costs they have incurred in developing their active travel networks. Chapter 6 of this guidance gives more information on reporting and monitoring requirements.

4.12 Review (and partial review) of the map

4.12.1 The purpose of the review cycle of the ATNM is to enable continuous refinement and improvement of the network and to take account of changes, such as in land use or environmental factors. Reviews also contribute towards demonstrating to Welsh Government that continuous improvements are being undertaken in line with the duties of the Act. The review process will be a combination of adding new future routes and changing the designation of future routes to existing routes as the infrastructure is built or improved. The review will also involve the removal of statements as improvements to existing routes are completed.

4.12.2 There may be circumstances in which local authorities wish to make a partial revision of their map earlier than required by Welsh Ministers. For example, where an unanticipated development is taking place and the authority wishes to ensure that it can be connected to the active travel network. In these circumstances the local authority may request that Welsh Ministers direct them to review their map by an earlier date, specifying the area which they wish to review. Welsh Ministers will consider approving a partial revision subject to evidence of appropriate engagement and consultation having taken place. Details of engagement requirements are contained within chapter 5.

4.12.3 At least one public consultation event should be held in each of the settlements affected by the revision.

4.12.4 The consultation process should run for a minimum of 12 weeks.

4.12.5 Submitting a partial or interim review will not affect the relevant timetable for submitting the authority's full review of the ATNM.

4.13 Planning status of the map

4.13.1 ATNMs should be used to inform the preparation and review of Local Development Plans and Strategic Development Plans. Planning Policy Wales requires ATNMs to inform site allocations, with priority given to sites that can be connected to existing and future active travel routes. The ATNM, therefore, has an important role in the planning system to help ensure new developments are linked to the wider active travel network.

4.13.2 Active Travel Network Maps are not definitive maps, in the way that Public Rights of Way maps are, and in general the location of future routes can be indicative. However, for active travel routes being incorporated in new developments, the exact route should be considered as part of the overall design for a scheme and be informed by a wider site and context analysis. This is in the spirit of walking, wheeling and cycling being the priority in the design of new development, as required by the sustainable transport hierarchy (see figure 3.3) from Planning Policy Wales. Once a route has been built, its exact location should be reflected in an updated version of the ATNM.


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Chapter 5: Consultation, engagement and promotion

This chapter outlines the legal responsibilities of local authorities under the Act to consult with the public and key stakeholders when planning and developing active travel initiatives. It clarifies the meanings of consultation, engagement, and promotion within the context of the Act, and highlights the obligation to involve all individuals and groups who have expressed a desire to participate.

In addition to consultation duties, the Act also requires authorities to actively promote walking, wheeling, and cycling more broadly.

5.1 Introduction

5.1.1 Routes and networks are far more likely to be successful, both in terms of uptake and implementation, when they are shaped by the people who will use them. Involving local communities, stakeholder groups, and individuals who walk, wheel, or cycle helps ensure that proposals reflect real needs and priorities. Engagement and consultation activities also offer valuable opportunities to promote the benefits of active travel directly to the public.

5.1.2 This chapter provides guidance on best practices for public and stakeholder engagement throughout scheme development, from the early planning stages to the more detailed phases. It emphasises the importance of following the principles of effective consultation and maintaining an inclusive approach, particularly in line with the Equality Act 2010. This includes meaningful engagement with groups and individuals representing people with protected characteristics. Authorities must also provide clear evidence of consultation, as outlined in this chapter and detailed further in appendix D.

5.1.3 The Well-being of Future Generations (Wales) Act 2015 sets out five ways of working that underpin sustainable development. Two of these are particularly relevant to consultation and engagement:

- **Involvement** – engaging a diverse cross-section of the population in decisions that affect them.
- **Collaboration** – working with others to find shared, sustainable solutions.

These principles reinforce the importance of inclusive, transparent, and meaningful engagement throughout the planning and delivery of active travel schemes.

5.1.4 To clarify the distinction in this context, the key differences between engagement and consultation are as follows:

- Engagement refers to a broad range of activities designed to involve communities in shaping walking, wheeling, and cycling schemes. This may include workshops surveys, drop-in sessions, and informal conversations.
- Consultation refers to the formal process of seeking views on specific proposals or decisions, typically involving published materials, defined timeframes, and documented responses.

Both engagement and consultation are essential to building trust, improving outcomes, and ensuring that walking, wheeling and cycling infrastructure meets the needs of all users.

5.2 The Duty to consult

5.2.1 The Act requires local authorities to engage with all individuals who have requested to be consulted.

5.2.2 Local authorities must clearly and accessibly advertise how members of the public can register their interest in being involved. This includes providing information about expected timescales for consultation and engagement activities.

5.2.3 In addition to members of the public, local authorities should involve the following organisations, as appropriate, in the consultation and engagement process:

- delivery partners which may include: other departments within the local authority, adjoining local authorities, community/town councils, One Voice Wales, National Park authorities Natural Resources Wales, Transport for Wales, Canal and River Trust, Welsh Water Dŵr Cymru, Severn Trent Water and Dee Valley Water, Network Rail, the Crown Estate, National Trust, Woodland Trust and the Welsh Government and its trunk road agents and elected members.
- other interested parties, including: the authority's active travel liaison group (where present), any Local Access Forum established for the area or any part of it, walking, wheeling and cycling groups, transport campaign groups, local health promotion groups (including public health teams within Public Health Wales and the local health board), local Chambers of Commerce, large employers, trade unions.
- children and young people: local authorities should engage with young people both through school and other educational establishments but also through youth services or youth groups and other forums where young people meet.
- people with protected characteristics: the Equality Act 2010 requires local authorities to specifically seek to engage with individuals and groups representing people with protected characteristics.

5.2.4 In addition to the duty to consult under the Act, local authorities are also required under other legislation introduced in chapter 3, to consult when developing specific proposals for new walking, wheeling, and cycling routes.

5.3 Engagement and consultation principles

5.3.1 Effective engagement and consultation in planning and designing active travel schemes should be guided by the following ABC principles:

- **Accessible** – events and materials should be inclusive in terms of location, format, language, and timing, and to all community members, regardless of background or ability.
- **Broad** – everyone who is directly or indirectly affected, including potential users, should have the opportunity to participate.
- **Clear in scope** – the purpose and limitations of the engagement should be transparent from the outset.

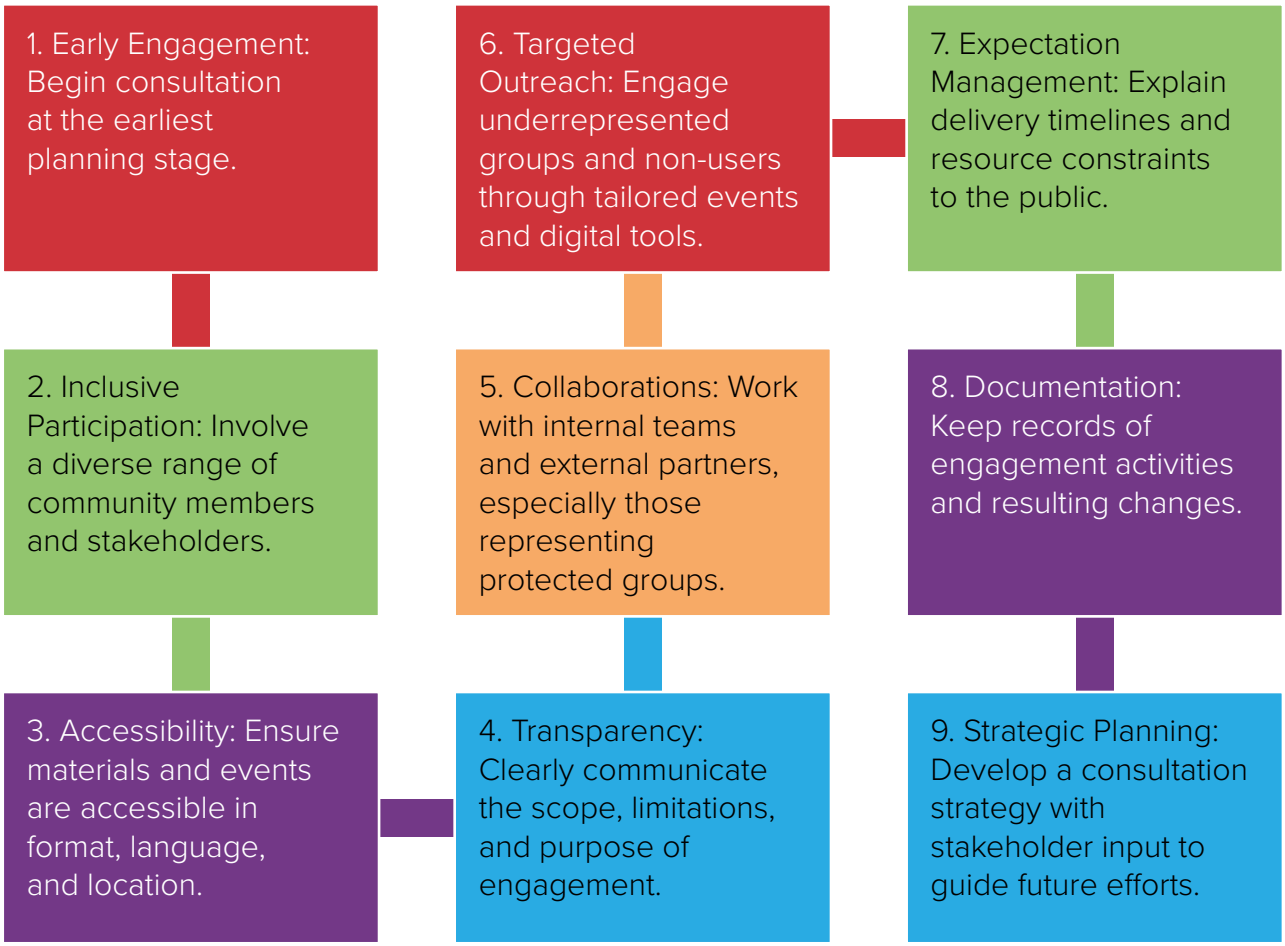
By following these principles, local authorities can ensure that their engagement and consultation processes are meaningful, transparent, and effective in shaping active travel infrastructure.

5.3.2 It is very important that the resources used (such as digital platforms, engagement methods and techniques) are appropriate to the key audience of the process.

5.3.3 When developing engagement and consultation plans, officers should collaborate with colleagues across departments, particularly those with expertise in equality, diversity, and inclusion, or who are connected to networks representing people with protected characteristics.

5.3.4 To ensure consistency and clarity, local authorities should develop an overarching consultation and engagement strategy. This strategy should outline the principles, priorities, and processes that will guide all engagement activities. Involving stakeholder groups, particularly organisations representing disabled people, in drafting the strategy will help ensure that future consultations are inclusive and follow a pre-agreed, accessible approach.

Figure 5.1: Engagement Framework for Active Travel Planning



5.3.5 Engagement should begin as early as possible and remain a central part of the network planning process, especially when identifying future routes. Local authorities should maintain a clear record of all engagement activities, including feedback received and any resulting changes to proposals. This record-keeping is essential for transparency and accountability throughout the development of individual schemes.

5.3.6 To reduce the risk of consultation and engagement fatigue, local authorities are encouraged to collaborate with other stakeholder organisations and agencies. Joint engagement events can maximise reach, share resources, and provide a more coordinated experience for the public.

Accessible

5.3.7 Engagement and consultation on active travel networks and schemes should be accessible and inclusive for everyone. Officers or consultants involved in these processes should have experience engaging with diverse communities to ensure all voices are heard and considered.

Figure 5.2: Examples of 3D models used in engagement events



5.3.8 Local authorities have a legal duty under regulation 5 of the Equality Act 2010 (Statutory Duties) (Wales) Regulations 2011, regulation 5 to engage with individuals and groups representing people with protected characteristics (as well as people who share one or more of the protected characteristics and have an interest in the way the authority carries out its functions, and anyone else the authority considers appropriate). Consultation and engagement materials and events should be designed with this in mind. For example:

- providing easy-read versions of documents.
- ensuring staff are available to assist participants.
- when communicating to public, children and other non-technical stakeholders, plans should be supported by photomontages or perspective images and renderings that illustrate how the proposals will look at eye-level when in-use.
- offering online tools with accessibility features such as adjustable contrast, screen reader compatibility, and alternative navigation options.

5.3.9 When planning in-person engagement events, location is key. It is important to choose venues that are easy to reach for the target audience and fully accessible to all users. Before confirming a venue, it should be visited in person and a checklist should be used to assess essential accessibility features, such as step-free access, signage, and accessible toilets. While checklists are helpful, they are not exhaustive. People with lived experience should be involved, to identify potential barriers and improve inclusivity.

5.3.10 Where visual displays are used, alternative formats should be planned to ensure the information is accessible to those who cannot engage with standard visual materials. This may include providing oral explanations of proposals or using tactile representations of planned developments, which some local authorities have successfully implemented. It is fundamental to enable visually impaired individuals to participate meaningfully in the consultation process.

5.3.11 It is recommended that local authorities engage with organisations such as the Wales Council of the Blind, who can support outreach and help connect with a wider network of individuals who may wish to be involved in the consultation.

5.3.12 The approach and format should be tailored to the needs of each group. A wide range of methods should be used to reach different audiences and ensure accessibility and inclusion. This might include printed notices, social media, local radio and/or community group sessions (for example, disability groups, cultural groups where Welsh or English is not the primary language, youth and children groups) (see section 5.4).

5.3.13 Consultation and engagement materials should be easy to understand and free from unnecessary technical language or jargon. Visual materials (such as drawings and scheme illustrations) should not assume any prior engineering knowledge. Clear, descriptive text should always be included to help people interpret what they are seeing. Technical details can be made available as supplementary information but should not form the core of consultation materials. The goal is to make the information accessible to everyone, regardless of their background or expertise.

5.3.14 If technical terms have to be used, a clear explanation should always be provided. Acronyms and abbreviations should be avoided where possible, or explained in full when they are used. The production of an Easy Read version of the documents should be considered, to help meet the needs of people with learning disabilities.

Broad

5.3.15 Effective engagement consultation at both the network and scheme levels should reach not only current users of the active travel infrastructure, but also potential users. Local authorities should make a concerted effort to reach groups who do not currently walk, wheel, or cycle regularly, to try to understand the reasons and how they can be overcome.

5.3.16 This could involve partnering with community events or hosting standalone engagement sessions in locations such as schools or other education establishments, workplaces, supermarkets, local shopping areas, healthcare providers or other places that generate everyday journeys. Online engagement tools can also be promoted strategically to reach underrepresented groups and those less likely to participate in traditional consultation formats (see section 5.4).

Additionally, outreach should include local businesses, community organisations, and special interest groups to ensure a broad and representative range of perspectives.

5.3.17 Promoting walking, wheeling, and cycling to school is a key priority for the Welsh Government. Schools should be actively involved in identifying and planning routes that could be used by students. Engagement and consultation can be enhanced through use of existing school-based programmes and initiatives that encourage active travel to school.

5.3.18 While the primary focus is on utility journeys (such as commuting, education, and running errands) active travel routes are usually also used for leisure, sport, and by equestrians, particularly in rural and semi-rural areas. Engagement strategies should reflect this diversity by involving a wide range of user groups.

5.3.19 Where possible, events should be visible and welcoming to passers-by, such as those held in market halls or on high streets, rather than hidden behind closed doors. This openness can encourage greater participation and engagement.

5.3.20 Creating inclusive infrastructure requires the meaningful involvement of women and girls in both the design and decision-making processes. Strong participatory methods, such as focus groups, targeted engagement activities, and feedback sessions, can help ensure that their needs are reflected in the built environment. For further guidance on gender-inclusive design, refer to section 9.3.

Clear in scope

5.3.21 The scope and structure of the engagement and consultation process should be clearly communicated. This includes:

- the purpose and focus of the consultation.
- the methods being used (for example surveys, workshops).
- the timeline for engagement and decision-making.
- what will happen with the feedback received.

Only information that is directly relevant to the purpose of the engagement/consultation should be asked. Keeping requests focused and concise helps reduce participant burden and improves the quality of responses.

5.3.22 To help people understand the context and purpose of a scheme, maps and visual aids should be included, clearly showing how the proposal fits into the local area. Materials overloaded with technical details should be avoided. Instead, it will be preferential to use simple figures and sketches, examples of similar schemes, clear, plain language.

5.3.23 It is essential to establish clear parameters for any engagement or consultation with the public or stakeholders. People should understand from the outset what aspects of a project are open to influence and what elements are fixed. This helps manage expectations and builds trust in the consultation process.

5.3.24 Clearly explaining the practical considerations (such as the time, funding, and resources required to deliver active travel infrastructure) can help manage public expectations. Inviting views on delivery timescales also encourages a shared understanding of the long-term nature of planning and implementation. This approach helps ensure that proposals are grounded in local priorities and reflect the ambitions of the communities they serve.

5.4 Tools for engagement and consultation

5.4.1 There is a wide and continually evolving range of tools and methods available for consultation and engagement, many of which are well-suited to active travel networks and schemes. Transport for Wales' Active Travel Promotional Toolkit offers a variety of resources to support this work.

To ensure broad and inclusive participation, a mix of digital and in-person methods should be used. Examples include:

- hosting events at key destinations and trip generators (such as schools, workplaces, shopping areas, transport hubs).
- community street audits.
- walking, wheeling, and cycling focus groups.
- semi-structured interviews.
- cycle route inspections.
- posters and site notices placed along routes (with clear instructions on how to participate).
- attending public events such as open days, family fun days, and university freshers' fairs.
- engaging directly with existing groups and forums (such as local access groups).
- radio and local media events.
- digital and remote engagement tools.
- online surveys promoted via social media or QR codes on posters.
- targeted digital marketing (such as social media ads).
- dedicated online consultation platforms with interactive mapping tools.
- telephone surveys and letter/flyer drops.
- social media-led events and online forum discussions, especially targeting current or potential active travel users.

Using a combination of these tools helps ensure that engagement is accessible, inclusive, and tailored to the needs of different communities.

5.4.2 Digital tools, such as surveys, interactive maps, and webinars, can significantly broaden the reach, enabling participation from those who may not attend in person. These tools are also effective for collecting both qualitative and quantitative feedback.

5.4.3 Digital platforms should be user-friendly across all devices (for example smartphones, tablets, laptops) and alternatives for those who cannot access digital content should be provided.

5.4.4 Not everyone has access to digital technology. To ensure inclusivity, alternative ways to participate, such as hard copies, telephone and semi-structured interviews, or focus groups should be offered. These methods can be especially valuable for gathering in-depth feedback from underrepresented groups.

Case study

Newtown pedestrian/cycling bridge community consultation

Background: Following requests from the local community for a bridge across the River Severn in Newtown, Powys County Council (Powys CC) undertook a feasibility study to identify a suitable site and investigate a connection between the housing and retail/employment opportunities on either side of the river. Subsequent engagement with the local community, including consultations through the ATNM process, regularly demonstrated strong local support for this crossing.

Stakeholder engagement: With increased funding for active travel being made available by Welsh Government, Powys CC were able to develop an initial concept design to facilitate discussions with local stakeholders. A set of images were drawn up and used to work with various groups including local sports clubs (rugby/tennis), the town council, walking, wheeling and cycling groups and local access groups representing disabled people. These stakeholders were able to communicate with their members and local residents, and helped secure grass roots level support for the bridge as part of a funding bid to Welsh Government.

Community engagement process: Having been successful in securing funding to construct the bridge, the council wanted to continue in the spirit of co-production during the design process and arranged a series of engagement sessions with the general public. The location and span of the proposed bridge meant that only two possible construction methods were feasible (cable stay and cable arch), but there was a considerable scope for the public to provide input to the style and aesthetics of the bridge. The council ensured that the brief given to the designers included a requirement for community engagement, and as a result the design team took part in the community engagement sessions.

Two events were organised and advertised in the local press, with the venues and times chosen in order to capture a range of people. Session 1 was held in the town's indoor market hall during an afternoon, whilst session 2 was held one evening in the local pub. 30-40 people attended each event and they were asked to look at a range of images of other bridges from around the world, and to choose which ones they liked the most by using coloured dots to identify their preference. Feedback from the sessions helped to refine the design process for the bridge as well as adding local input into the key links and connections to destinations in the town.

Figure 5.3: Community consultation event



5.5 Active Travel Network Map (ATNM) engagement and consultation

5.5.1 The preparation of the Active Travel Network Map (ATNM) is a key opportunity for stakeholders to shape the long-term development of walking, wheeling, and cycling networks and facilities. It is essential that meaningful opportunities are provided for people to contribute their views. Engagement and consultation activities and materials also serve as a valuable platform to promote active travel more broadly.

5.5.2 Before submitting the ERM/INM (now known as ATNM) to the Welsh Government, the local authority must carry out a formal public consultation. This consultation must run for a minimum of 12 weeks to ensure sufficient opportunity for public engagement.

5.5.3 The quality and effectiveness of the consultation process will be a key factor in the Welsh Ministers' decision to approve the ERM/INM (now known as ATNM). The submission must include a comprehensive report detailing both the engagement and consultation activities undertaken. A copy of the pro-forma to be used by local authorities for reporting on the engagement and consultation process is available in appendix D.

Welsh Ministers will give equal weight to:

- early engagement efforts, and
- participation levels during the formal consultation period.

5.5.4 As outlined in chapter 10, a two-stage engagement process is recommended when preparing network proposals for statutory consultation. This approach ensures that public and stakeholder input is gathered at key points in the development process.

5.5.5 Engagement should take place at two key stages:

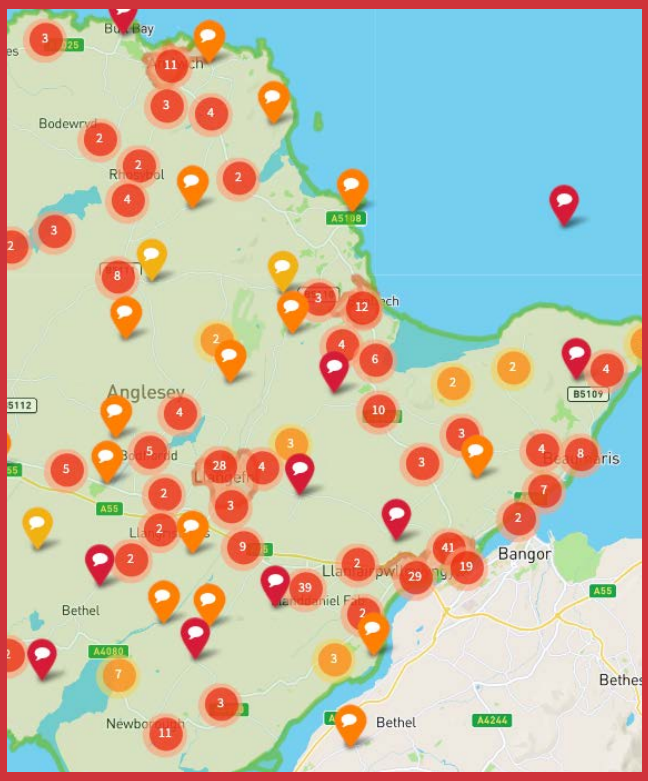
- route identification stage: this early engagement allows the public and stakeholders to contribute ideas and feedback before routes are finalised. It complements the technical route identification work carried out by local authorities.
- validation stage: at this point, stakeholders can review the proposed network in its entirety and provide further comments either to support, enhance, or challenge the proposals.

Case study

Route identification stage
Many local authorities made use of the digital engagement platform Commonplace at the beginning of the process for updating their ATNMs in 2021.

This online platform asked members of the public to drop a pin and answer a series of questions where in their local area they think improvements to walking, wheeling or cycling infrastructure were needed. This resulted in a "heat map" showing areas of highest demand. The heat map consultations were able to reach high numbers of people and because some demographic information was collected, local authorities were then able to target areas where lower participation was noticed.

Figure 5.4: Example of outputs from map-based engagement on the previous round of ATNM engagements, a Commonplace heatmap, to visualise public input



5.5.6 A formal consultation on the draft ERM/INM (now known as ATNM) is a statutory requirement. However, if early engagement generates a high volume of new proposals or conflicting views, local authorities may choose to hold an interim engagement stage before the formal consultation. This optional step allows for further refinement of the network and can help reduce the number of changes required after the statutory consultation.

5.5.7 An example list of required consultees is provided in section 5.2.3. Engagement should be inclusive and representative of all users and potential users of the network.

5.5.8 As highlighted in section 5.3.16, promoting active travel to school is a key priority. Local authorities should involve schools and youth groups in planning and use existing programmes to support engagement. Involving children and young people is a vital part of the consultation process. This can be achieved through:

- schools and educational institutions.
- youth groups and community forums.
- standalone youth-focused events.

Local authorities can also draw on existing evidence from:

- school travel plans or community access plans.
- school Health Research Network questionnaires.
- behaviour changes programmes such as Active Journeys and WOW (Walk to School).

The Active Travel Promotional Toolkit includes practical resources for engaging with young people and other specific groups.

Rights of children and young persons

In exercising their functions under the **Active Travel (Wales) Act 2013**, local authorities are required to undertake all reasonable measures to ensure that children and young people are involved in the planning, implementation and review of decision-making processes. In doing so, local authorities can make use of existing mechanisms including local school councils, youth councils and advocacy services. All engagement with children and young people should be informed by the **Children and Young People's National Participation Standards for Wales**, published by Welsh Government. This document stresses that children and young people's participation is an ongoing process rather than simply a series of one-off engagement events. The Active Travel promotional toolkit provides guidance information on engagement with specific groups of people such as young people.

5.5.9 Local authorities should work with other organisations and agencies to coordinate engagement activities. Joint events can help increase participation and reduce the risk of consultation fatigue among communities.

5.5.10 Creating a clear engagement and consultation framework helps ensure consistency and transparency. This should include:

- a stakeholder contact list.
- a process for members of the public to register their interest in being consulted.
- defined roles and timelines for involving elected members and ward councillors.

5.5.11 Consultation on the ERM/INM (now known as ATNM) does not replace other statutory consultation requirements, such as those related to Compulsory Purchase Orders or Traffic Regulation Orders that must still be fulfilled separately as required by law, or engagement obligations that may apply to individual active travel schemes. Local authorities must continue to follow their standard procedures to ensure that all infrastructure projects meet the needs of the wider community, not just those who walk, wheel, or cycle.

5.6 Engagement and consultation on scheme delivery

5.6.1 In addition to the engagement and consultation required for developing the ERM/INM (now known as ATNM), local authorities must also consult on individual walking, wheeling, and cycling schemes. These consultations ensure that each project reflects the needs of the communities it serves. Further advice on tools for engagement and consultation is available in section 5.3.

5.6.2 The scale and approach to consultation should reflect the size and impact of the scheme:

- Larger schemes or programmes of work benefit from engagement at multiple stages and should follow a co-production approach wherever possible.
- Smaller interventions (such as installing a dropped kerb) may only require statutory consultation, though this should be assessed on a case-by-case basis.

5.6.3 For most schemes, engagement should begin early in the development process. This can align with Stage One of the Welsh Transport Appraisal Guidance (WelTAG), where stakeholders help identify key issues, project objectives and initial concepts.

For example, if a new route is proposed to connect a residential area with a primary school, early input from the school and local community can help shape a more effective and locally supported solution.

5.6.4 A second round of engagement should take place once an outline design has been developed. This provides an opportunity to refine the scheme and influence the final outcome. As a minimum, consultation should include:

- local elected members.
- town and community councils.
- local residents and businesses.
- landowners.
- stakeholders and groups with protected characteristics who may be affected.

5.6.5 As discussed in section 5.3.23, clearly communicating what aspects of a scheme are open to change and what is fixed helps manage expectations. This includes outlining timeframes, funding, and how feedback will be used. Some local authorities may choose to engage after the concept design stage, when there is more scope for stakeholders to influence the design. Regardless of timing, it is essential to clearly communicate:

- what aspects of the scheme are open to change.
- what decisions have already been made.
- how feedback will be used.

Setting clear parameters helps manage expectations and builds trust in the process.

5.7 Effective engagement and consultation

5.7.1 Key principles of engagement, such as early involvement, managing diverse opinions, and tailoring strategies to context, are integrated throughout this chapter. Refer to section 5.3 for practical guidance.

5.7.2 Well-designed engagement and consultation processes lead to better infrastructure and higher usage. When people have the opportunity to shape walking, wheeling, and cycling schemes in their area, they are more likely to support and use them.

5.7.3 Consultation and engagement often reveals differing and sometimes conflicting views. However, when combined with reliable data, it can help build a mandate for progressing schemes, even those that may be considered controversial. Early engagement allows stakeholders to raise concerns and suggestions, reducing the risk of opposition later in the project.

5.7.4 This guidance uses the terms “consultation” and “engagement” to describe the process of gathering feedback from the public and stakeholders. In practice, participation exists on a continuum, from basic consultation to full co-creation or co-production. This is often referred to as the “ladder of participation”:

- lower levels (such as surveys) are less resource-intensive and accessible to more people.
- higher levels (such as co-design workshops) require more time and commitment but often result in stronger community ownership and better outcomes.

Both approaches have value, and a balanced strategy should be used depending on the context and resources available.

5.7.5 Engagement strategies should be tailored to the specific context of each scheme. Local authorities should use existing baseline data to inform their approach. This could include scheme-specific data or broader sources such as Public Service Board Well-being Assessments, which provide insights into local priorities.

5.7.6 It is considered good practice for local authorities to gather feedback on the consultation experience itself. Capturing satisfaction levels helps to ensure an inclusive approach, and identify and address any accessibility barriers in the consultation process.

5.8 Promotion

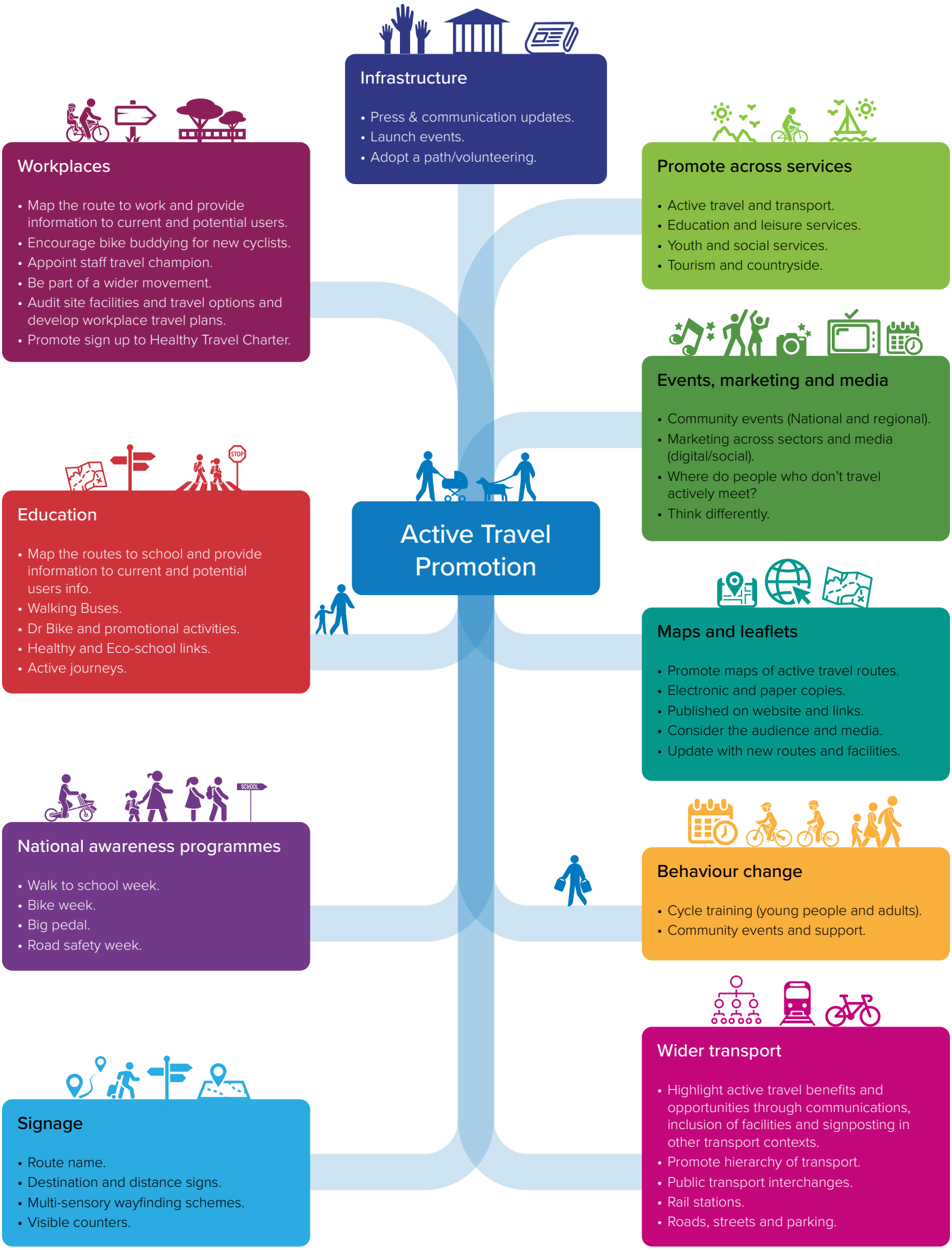
5.8.1 Local authorities’ duties under the Active Travel (Wales) Act 2013 include actively promoting walking, wheeling and cycling journeys, highlighting their role in reducing air pollution, and securing new and improving existing active travel routes and facilities. A summary of areas for the promotion of walking, wheeling and cycling is included in figure 5.5.

5.8.2 To effectively promote active travel, local authorities should work collaboratively across departments and regional boundaries. Partnerships should also be formed with other relevant external organisations such as:

- schools and youth services.
- health boards.
- workplaces.
- transport operators.
- interest and advocacy groups.
- disability forums.
- voluntary and community organisations.

5.8.3 Transport for Wales, in partnership with all 22 Welsh local authorities, has developed a comprehensive Active Travel Promotional Toolkit. This resource offers practical guidance and draws on evidence-based behaviour change techniques to support the promotion of walking, wheeling, and cycling.

Figure 5.5: A summary of areas for the promotion of walking, wheeling and cycling



5.8.4 Each financial year, local authorities must report to Welsh Ministers on how they have promoted active travel. This report should summarise activities across any relevant departments, including those related to health promotion, environmental protection and transport.

5.8.5 Authorities may choose to provide more detail relating to individual projects where this supports local policy objectives. A reporting template is included in appendix F (includes the annual reporting template for promotional activities), and the latest versions will be issued ahead of report deadlines by Welsh Government.

5.8.6 Sharing results from monitoring activities can help to support future improvements to active travel infrastructure. Monitoring duties are outlined in chapter 6, with recommended methods detailed in chapter 16.

5.8.7 Publishing and promoting the Active Travel Network Map (ATNM) (or tailored versions of it) can raise awareness of available routes and facilities. An example map is provided in appendix C.



Chapter 6: Monitoring and reporting

The Act requires local authorities to submit a report to the Welsh Government on the extent to which people walking, wheeling and cycling make active travel journeys and set out what actions have been taken to promote active travel, each time they submit their network map. They also need to report annually on the costs they have incurred making improvements to their active travel network and the activities they have undertaken to promote active travel.

6.1 Introduction

6.1.1 Monitoring and reporting is key in evaluating the impact of improvements, justifying future improvements and providing evidence to support continuous development of good practice.

6.1.2 This chapter summarises the reporting requirements of the legislation and introduces the importance of taking a strategic approach to having a monitoring framework. Chapter 16 provides further details of how local authorities should meet these requirements.

6.2 Reporting duties under the Active Travel (Wales) Act

6.2.1 The Act places reporting duties on both Welsh Ministers and local authorities.

6.2.2 Welsh Ministers are required to make annual reports on the extent to which people walking, wheeling and cycling make active travel journeys.

6.2.3 The Act requires that each time the local authority submits its ERM/INM (now known as ATNM), the authority must present a report to Welsh Government showing how the level of use of active travel routes and related facilities in the local authority's area has changed since the last submission.

6.2.4 The Act also requires local authorities to submit an annual report specifying the costs incurred in making year on year improvements to active travel routes and facilities in the most recent financial year. The annual report must also set out what actions local authorities have taken to promote active travel. Annual reports should be submitted by 30th September each year. Appendix F provides the current templates for local authorities to use for these annual and triennial reports. These may be subject to change and will be reissued accordingly.

6.2.5 Information on how to gather the data required for the reports can be found in chapter 16.

6.2.6 Local authorities should publish the reports they submit to the Welsh Ministers on their website so members of the public can view the reports.

6.3 A strategic approach

6.3.1 As introduced in section 6.2, the Act places specific duties on local authorities and Welsh Government for annual reporting and traditional reporting on each submission of the ATNM. To comply with this duty, local authorities should undertake detailed monitoring of individual active travel schemes. Recommendations for how to undertake this are included in chapter 16.

6.3.2 It is recommended that a local monitoring and evaluation framework is put in place by each authority so that a strategic approach, which sets the context for individual scheme level monitoring, is established. This framework would usefully refer to a wider range of data (such as road safety reports, accident hotspots, air quality monitoring reports) so that trends are tracked which are useful to inform decisions related to active travel.

6.3.3 Welsh Government and TfW have produced a national Active Travel Monitoring Framework to monitor progress towards the commitments in Llywbr Newydd.

6.3.4 Local authorities should refer to this when preparing their local active travel network evaluation frameworks.



Part 2: Planning and design for active travel in Wales

Chapter 7: Introduction to planning and design

Part 2 of the guidance sets out the approaches for planning and designing networks and routes for walking, wheeling and cycling, following on from **part 1** which dealt with the policy background and formal processes for complying with the **Active Travel (Wales) Act 2013**.

Key considerations in this chapter include:

- highway design and the **Highways Act**.
- implementation of the Act and guidance for trunk road and local road schemes.
- status of the design elements provided in this guidance and other related standards.

7.1 Planning and design for active travel in Wales

7.1.1 Whilst this part of the document relates mainly to the technical elements involved in designing infrastructure to enable and support active journeys, it should be emphasised that for routes and infrastructure to achieve the greatest potential for modal shift, infrastructure changes should be accompanied by effective behavioural measures. These measures should be informed by evidence and methodologies from the behavioural sciences, and include activities such as:

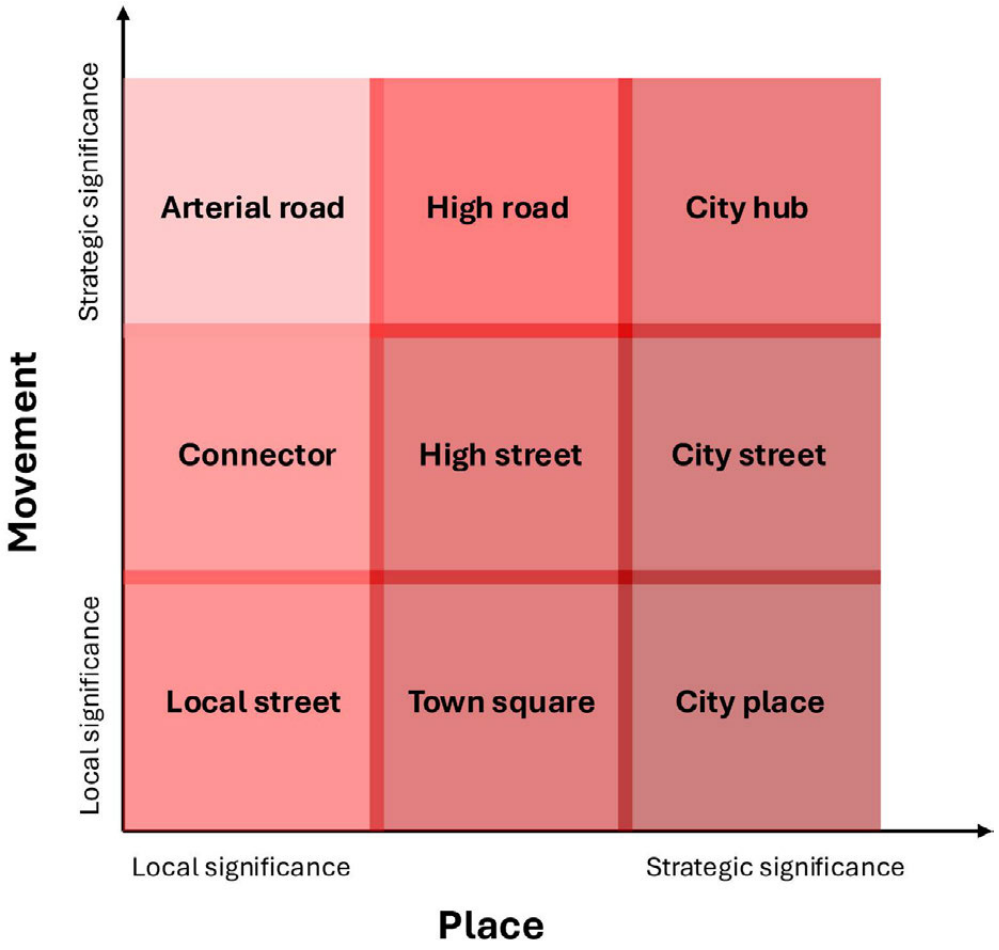
- promotion of the benefits of walking, wheeling and cycling.
- events and projects that support inclusive cycling for all ages and abilities.
- walk/wheel/cycle to work/school events and activities.
- enforcement of traffic offences.

7.1.2 Part 2 provides design details for making improvements to walking, wheeling and cycling infrastructure. This part of the guidance helps stakeholders meet key duties under the Act, including:

- making continuous improvements to active travel infrastructure.
- enhancing provision for people walking, wheeling and cycling when constructing, improving or maintaining highways.
- having regard to the needs of people who walk, wheel and/or cycle when putting in place traffic management arrangements.

7.1.3 All new active travel infrastructure, whether installed as part of a new development, trunk road, local road or active travel led scheme, should respond to the specifics of their location's needs. Figure 7.1 provides a useful framework to guide designers in identifying the place and movement function of different settings. It shows two axes: 'movement' and 'place', with the movement axes relating to the moving function across different modes. The place axes relate to the activities that happen in specific places, for example places to rest, play and for social connection.

Figure 7.1: Place vs movement matrix



7.1.4 The framework recognises that depending on the setting, streets and urban spaces will serve a variety of roles by identifying these as it helps to frame the appropriate design objectives.

7.2 Designers of walking, wheeling and cycling facilities

7.2.1 The design of construction work, such as walking, wheeling and cycling facilities, is a regulated activity under the Construction Design and Management Regulations 2015 (CDM Regulations). These regulations require those undertaking design activities to have sufficient skills, knowledge and experience to understand hazards arising from their designs, and to take steps to design these hazards out.

7.2.2 It is desirable that active travel schemes are designed by people who walk, wheel and/or cycle regularly as part of everyday journeys, and that the designers experience the routes before (when possible) and after construction.

7.2.3 As cycling is currently the least used active travel mode in Wales, employers and client organisations should encourage and facilitate the designers of cycle facilities to develop their skills and experience in everyday utility cycling. This will help also designers appreciate site-specific local factors and context, and will give designers a greater appreciation of how the routes they are designing will meet the needs of and impact upon users. Experiencing the route after construction will help designers evaluate the effectiveness of the solutions they implemented, and support continuous improvement.

7.3 Status of the Active Travel Act guidance

7.3.1 This guidance is issued using the powers of the Welsh Ministers to give guidance under sections 2(6), 2(9), 3(4), 4(5) and 7(2) of the Active Travel (Wales) Act 2013.

7.3.2 The document is published by the Welsh Government for use throughout Wales and the contents must be considered when designing and maintaining active travel routes and related facilities, enhancing provision for people walking, wheeling and cycling as part of other highway schemes (including planned highway maintenance works), or when considering the needs of people walking, wheeling and cycling as part of new developments, traffic management and road safety schemes.

7.4 Highway design and the Active Travel Act

7.4.1 Opportunities to enhance the provision for active travel must be taken whenever works associated with the highway are carried out, including new construction, maintenance or any improvements.

7.4.2 Provision for walking, wheeling and cycling should be integral to planning and design from the outset, rather than being seen as an ‘add-on’ once the needs of motor traffic have been considered. Designers of new highways should consider the five principles of good walking, wheeling and cycling routes presented in chapter 9 – Coherent, Direct, Safe, Comfortable and Attractive – and find ways to meet them as part of the scheme.

7.4.3 The Active Travel (Wales) Act 2013 stipulates that Welsh Ministers and each local authority must take reasonable steps to enhance the provision made for people walking, wheeling and cycling when they are exercising their functions under Parts III, IV, V, IX and XII of the Highways Act 1980 (creation, maintenance and improvement of highways, interference with highways and acquisition etc. of land), as far as it is practicable to do so.

7.4.4 The Highways Act 1980 includes provisions on the creation, maintenance and improvement of highways. Active travel routes will mostly be highways in law (a highway being essentially a route over which the public has the right to pass and repass). The definition of a highway excludes permissive routes, where the landowner’s consent to use of the route is required, though permissive routes may also be designated as active travel routes.

7.4.5 Table 7.1 summarises the provisions of the Highways Act 1980 that are affected by the Active Travel (Wales) Act 2013.

7.4.6 Highway authorities have not always carried out these functions in a way that would be compatible with the aims of the 2013 act. Some newly-built highways and "improvement" schemes have failed to improve conditions for people walking, wheeling or cycling, and in some cases have made conditions worse.

7.4.7 When maintaining, improving or creating new highways, authorities should treat walking, wheeling and cycling with at least the same importance and consideration as motorised transport.

7.4.8 Schemes to build new or improved highways will have a primary objective, for example to reduce congestion or to provide access to a new area of development, but authorities must also give careful consideration to whether (and how) the scheme can add to the active travel network.

7.4.9 Within the Active Travel (Wales) Act 2013, authorities must include the objective of enhancing provision for walking, wheeling and cycling, and translate this into specific and measurable outcomes; for example, making a suitable link from a residential area to a school. This will enable the emerging designs to be assessed against the stated objectives.

Table 7.1: Function and requirements

Function being exercised under	Duties and powers	Requirements of the Active Travel (Wales) Act 2013
Part 3 of the Highways Act (1980) – Creation of Highways	Power to create new highways, footpaths and bridleways.	The duty to enhance provision for people walking, wheeling and cycling when undertaking highway construction, maintenance or improvement is a fundamental component in the construction of active travel networks. Highways authorities must seek to enhance provision, unless they can demonstrate good reason not to. The consideration of the needs of people walking, wheeling and cycling should be an important consideration in all highways projects and feature in the earliest design considerations. Local authorities should align their active travel projects and planned highway maintenance programmes, seeking opportunities to deliver improvement for people walking, wheeling and cycling when carrying out planned highway maintenance works. The costs of enhancing Active Travel facilities in new road schemes will need to be taken in account of as part of individual schemes and planned for accordingly. It may be reasonable not to include walking, wheeling or cycling provisions, if the authority's Active Travel Network Map includes a satisfactory alternative route that can be delivered more economically and within a similar timeframe. However, that does not remove the need to ensure the changes in the highway enhance the safety of people walking, wheeling and cycling unless the type of highway explicitly prohibits walking, wheeling and/or cycling. Highways projects in Wales must not make walking, wheeling and cycling less convenient or safe. Local authorities should ensure they have an audit trail demonstrating how they have met this duty in each highway improvement project and where it has been determined that no walking, wheeling or cycling provisions are to be made, then a justification for this decision should be provided.
Part 4 of the Highways Act (1980) – Maintenance of Highways	Duty to maintain highways. Power to adopt new public highways.	
Part 5 of the Highways Act (1980) – Improvement of Highways	Powers to generally improve highways, including constructing cycle tracks, traffic calming, refuges, bridges, subways etc.; duty to construct footways where necessary or desirable.	

Function being exercised under	Duties and powers	Requirements of the Active Travel (Wales) Act 2013
Part 9 of the Highways Act (1980) – Lawful and Unlawful Interference with Highways and Streets	Duty to protect the public's right to use a highway, removal of obstructions, prevention of damage etc. Duty to remove snow and soil etc.	To meet their duty under the Act, highway authorities must enhance provision for people walking, wheeling or cycling when permitting or enforcing against interference with highways, where practicable to do so. For example, in controlling excavations of highways, local authorities should seek to enhance provision for people walking, wheeling or cycling when restoring the highway.
Part 12 of the Highways Act (1980) – Acquisition, Vesting and Transfer of Land	Powers to acquire land to construct public highways.	To meet their duty under the Act highway authorities must enhance provision, for people walking, wheeling and cycling when acquiring land for highway construction where practicable to do so. For example, when acquiring land for the construction of a road, local authorities should also acquire land for the construction of walking, wheeling and cycle routes.

Table 7.2 summarises the duties regarding the needs of people walking, wheeling and cycling when Welsh Ministers and local authorities are exercising their functions under:

- Parts 1, II, IV and VII of the Road Traffic Regulation Act 1984 (general and special traffic regulation, parking places and obstructions).
- Part 3 of the New Roads and Street Works Act 1991 (street works).
- Part 2 of the Traffic Management Act 2004 (network management by local traffic authorities).

Table 7.2: Function and requirements (2)

Function being exercised under	Duties and powers	Requirements of the Active Travel (Wales) Act 2013
Part 1 of the Road Traffic Regulation Act 1984 – General Provisions for Traffic Regulation	Powers to make orders to regulate traffic – prohibition, restriction or regulation use by any type of traffic. Powers to make experimental traffic orders.	To meet their duties under this part of the Act local authorities and the Welsh Ministers must have regard to the needs of people walking, wheeling or cycling in making traffic regulation orders prohibiting, restricting or regulating the use of a road. For example, if local authorities or the Welsh Ministers make a traffic regulation order to close roads for an event they must consider the effect upon people walking, wheeling and cycling when deciding to make the order and take mitigating action in making the order such as putting suitable diversions in place. When planning diversions, the needs of disabled users must be fully considered. Due consideration must also be given to the impact on people new to walking, wheeling or cycling of any change from a separated route to one that brings them into contact with motorised traffic.
Part 2 of the Road Traffic Regulation Act 1984 – Traffic Regulation in Special Cases	Powers to make traffic regulation orders during construction works or for other special reasons. Powers to regulate traffic on byways in National Parks.	
Part 4 of the Road Traffic Regulation Act 1984 – Parking Places	Power to provide parking places for vehicles (of any class), both on and off street. Power to acquire land to create parking places.	To meet their duties under this part of the Act, local authorities must have regard to the needs of people walking, wheeling and cycling in providing off-street parking, authorising on-street parking and loading bays and the acquisition of land for parking. For example, local authorities should consider the needs of people walking, wheeling and cycling in authorising on-street parking particularly where it would have a negative effect upon on-road cycle routes. If local authorities wish to authorise on-street parking where there would be negative effects for people walking, wheeling or cycling, alternative provision to mitigate these effects must be considered.
Part 7 of the Road Traffic Regulation Act 1984 – Bollards and Other Obstructions	Power to erect bollards etc. to prevent unlawful vehicular access.	In placing bollards or other obstructions to prevent access to vehicles, local authorities must have regard to the needs of people walking, wheeling and cycling. Local authorities must consider whether access for people walking, wheeling and/or cycling needs to be prohibited. If it does not, they must ensure that any obstructions are designed so that they do not prevent their access.

Function being exercised under	Duties and powers	Requirements of the Active Travel (Wales) Act 2013
Part 3 of the New Roads and Street Works Act 1991 – Street Works in England and Wales	Powers to control the placing and subsequent works to statutory undertakers' equipment, and the reinstatement of the highway.	Part 3 of the New Roads and Street Works Act 1991 concerns street works. Local authorities must have regard to the needs of people walking, wheeling or cycling in: • granting street works licences. • giving directions as to the timing of street works. • the placing of apparatus. • restricting street works following substantial road works. • exercising their duty to co-ordinate works and giving consent to place apparatus on a protected street. Local authorities must consider the effects that street works may have when deciding whether to grant licenses, and should seek to minimise any disruption for people walking, wheeling or cycling when giving any directions or placing any restrictions on street works. Please see 114/20: supplementary guidance for the safety at street works and road works a code of practice.
Part 2 of the Traffic Management Act 2004 – Network management by local traffic authorities and strategic highways companies	Duties in relation to network management by local authorities (which includes the road network used by pedestrians and cyclists).	Part 2 of the Traffic Management Act 2004 concerns network management by local traffic authorities. Under the Traffic Management Act 2004 local authorities are under a duty to manage their road network. This duty requires local authorities to secure the expeditious movement of all road users, including people walking, wheeling or cycling. Local authorities must also ensure that measures to secure the expeditious movement of traffic are safe for all road users. To meet their duty under the Act, local authorities must have regard to the needs of people walking, wheeling or cycling in setting priorities and making decisions about how to secure the expeditious movement of all traffic, motorised and otherwise.

7.4.10 Section 108(1)(s) and (2A) of the Transport Act 2000 requires local authorities to develop local transport plans. The Active Travel (Wales) Act 2013 stipulates that local authorities must have regard to their ERM/INM (now known as Active Travel Network Map – ATNM) when updating local transport plans.

7.4.11 This duty was also modified by the Transport Act 2006, which requires local authorities to have regard to the Wales Transport Strategy when preparing their local transport plans. These plans must be approved by the Welsh Ministers, as do the ERM/INM (now known as ATNM).

7.5 Trunk roads

WelTAG

7.5.1 The requirements of tables 7.1 and 7.2 also apply to trunk roads.

7.5.2 The Welsh Transport Appraisal Guidance (WelTAG) represents best practice for the identification, development, appraisal and evaluation of transport interventions in Wales. The WelTAG process should be applied to all transport projects funded in part or in full by the Welsh Government, including improvements to the trunk road network.

7.5.3 The need, nature and extent of any improvement to a trunk road, should be determined by application of the WelTAG process. The WelTAG process will also help establish the nature and extent of active travel provision and promotion to be incorporated in the improvement, subject to compliance with the Active Travel (Wales) Act 2013 and the Welsh Government's policy and strategy for active travel.

7.5.4 WelTAG engagement and consultation exercises should include active travel stakeholders and representatives and local access forums together with all other delivery partners and groups.

7.5.5 Consideration should be given to the updating or re-running of WelTAG studies on trunk road improvement schemes, when greater than 3 years old.

7.5.6 Where a WelTAG study indicates that a trunk road improvement scheme has the potential to contribute to enhancing the provision for and experience of people walking, wheeling or cycling, reasonable steps should be taken to:

- upgrade any existing trunk road active travel infrastructure to current active travel standards.
- work with the local authority to complete any routes on their approved Active Travel Network Map (ATNM) in parallel with completion of the trunk road improvement scheme.
- work with the local authority to upgrade any of their existing active travel infrastructure to current active travel standards in parallel with completion of the trunk road improvement scheme.

Design Manual for Roads and Bridges (DMRB)

7.5.7 All highway design on the trunk road network is undertaken in accordance with the Design Manual for Roads and Bridges (DMRB). Within the DMRB the primary guidance document for Active Travel design is GG 142, the contents of which align with this document. Where the DMRB does not provide information on any aspect of Active Travel design then the contents of this document should be used for design guidance.

7.5.8 Where a scheme cannot fully comply with the applicable DMRB requirements, any proposed departures from requirements should be identified at the earliest opportunity and progressed through the relevant DMRB Departure from Requirements approval process.

7.5.9 Additional guidance directly relating to trunk roads, is included in Procedure and Advice Guidance (PAG) 115/20 Active Travel and Trunk Road Improvement Schemes. This PAG reinforces the need for designers to understand Welsh Ministers' duties under the Active Travel (Wales) Act 2013. It also stipulates promoting a cross boundary/cross organisational approach to delivery, to maximise the impact of trunk road investment on active travel, and requires a robust peer reviewed and auditable approach to decision making.

7.5.10 For trunk road and motorway schemes, a WCHAR is most effective when it is undertaken as early as possible in the scheme development process before key design decisions have been fixed. Ideally the WCHAR should evolve alongside the scheme throughout each WelTAG stage, providing ongoing input to the design and option selection process.

If the initial WCHAR assessment is completed before or during optioneering (stage 0 or stage 1 WelTAG) it can:

- Identify existing pedestrian, cycle and equestrian desire lines.
- Influence junction layouts, crossing locations and route alignments.
- Highlight severance, accessibility and safety issues before they become embedded in the design.
- Reduce the need for redesign at subsequent design stages.
- Ensure active travel opportunities are considered alongside other scheme objectives from the outset.

7.5.11 Within the immediate geographic area over which the WelTAG study indicates that the trunk road improvement scheme has the potential to contribute to enhancing the provision for and experience of people walking, wheeling or cycling, subject to the availability of funding, reasonable steps should be taken to:

- upgrade any existing trunk road active travel infrastructure to current active travel guidance standards.
- work with the local authority to complete any routes on their approved Active Travel Network Map (ATNM) in parallel with completion of the trunk road improvement scheme.
- work with the local authority to upgrade any of their existing active travel infrastructure to current active travel guidance standards in parallel with completion of the trunk road improvement scheme.

7.6 Local roads

7.6.1 For all non-trunk road networks this Active Travel Act Guidance must be considered by local highway authorities when designing active travel routes, even where the advice in this document conflicts with current local authority design standards. Local authorities may also consider guidance contained in the Manual for Streets and Manual for Streets 2 (and any subsequent revisions), but advice contained in this document will take precedence if there is any conflict.

7.6.2 When developing local road schemes, the requirements highlighted in tables 7.1 and 7.2 must be considered and reasonable steps must be taken to:

- upgrade any existing active travel infrastructure to current guidance standards.
- work with other local authority departments to complete any routes included on the approved Active Travel Network Map (ATNM) in parallel with completion of the road improvement scheme.
- keep a clear audit trail of all decisions made during the course of the planning, design and implementation of the road improvement scheme as per the requirements set out in section 7.4 above. The Design Decision Log form should be used (see appendix L), to record and communicate the factors considered by Designers affecting the design decisions, alternatives considered, and the rationale for the final option selected.

7.6.3 The authority should retain an audit trail for any design decision that does not follow the recommended dimensions and layouts in the Active Travel Act Guidance. This documentation will form the basis of the "explanation" required by section 3(6) of the Active Travel (Wales) Act 2013, which states:

"When submitting an existing routes map to the Welsh Ministers under this section a local authority must also submit to them:

d) a statement of the extent (if any) to which any of the active travel routes shown on it do not conform to standards specified in guidance given under section 2(6).

e) an explanation of why the local authority has nevertheless decided that it is appropriate for them to be regarded as active travel routes."

7.7 Road Safety Audits

7.7.1 Road Safety Audits (RSAs) provide an effective, independent review of the road safety implications of engineering interventions for all road users. It is recommended that Stage 1 – 4 RSAs are undertaken not only in road schemes, but also on all schemes involving walking, wheeling, cycling by professionals with experience in active travel. RSAs shall be undertaken in line with GG 119 on all schemes that make changes to the layout on trunk roads and motorways.

7.8 New developments

7.8.1 In conjunction with Planning Policy Wales, this guidance will support the masterplanning, layout and design of development sites, ensuring that all newly planned development are fully accessible by walking, wheeling and cycling. This applies to private and public sector developments, whether mixed use, housing, employment, or public services, such as schools and hospitals. It relates to provision within the site, and to connections between the site and nearby services, facilities and active travel networks.

7.8.2 Planning Policy Wales (PPW) clearly states that "the sustainable transport hierarchy should be a key principle in the preparation of development plans, including site allocations, and when considering and determining planning applications" (see figure 3.3). Careful consideration needs to be given in development plans to the allocation of new sites which are likely to generate significant levels of movement, to ensure that access provisions which enable walking, wheeling and cycling, as well as for public transport, are included from the outset and that any implications associated with airborne pollution can be addressed.

7.8.3 The design of development proposals should, in accordance with the sustainable transport hierarchy, start with identifying the shortest, most attractive walking, wheeling and cycling connections and then addressing the other transport needs.

7.8.4 A key factor within Planning Policy Wales (PPW) is that "Sustainable transport infrastructure and services should be prioritised and put in place from the outset, before people have moved in and travel patterns have been established." Local authorities should therefore work closely with developers to ensure they fully understand and implement this guidance.

7.8.5 PPW and the Act means that authorities should review their design guidelines for developers, to ensure that adequate provision is made for active travel by developers' design teams (and/or refer developers to comply with the ATAG). This will require a consideration of the basic elements making up new highways (for example, motor traffic lane widths, cycle lanes/ tracks, footways, verges and so on) to ensure that highways on new developments provide appropriate facilities for walking, wheeling and cycling as a matter of course.

7.8.6 The planning and design of new and improved infrastructure will be led by the transport assessment for the new development, which is used to forecast the all-mode travel demands, assess their impact on the surrounding network and design appropriate mitigation measures. It should be noted that smaller developments, on designated active travel routes which fall below the normal thresholds to provide Transport Assessments, should still be required to contribute to active travel improvements (see WelTAG).

7.8.7 Developments that do not adequately make provision for walking, wheeling and cycling should not be approved. This may include adequate off-site improvements for people walking, wheeling and/or cycling using existing highways that are affected by the development.

7.9 Land acquisition

7.9.1 Section 10.8 outlines the process for showing routes on the ATNM which are not owned by the local authority or within the highway boundary.

7.9.2 The Welsh Government believes compulsory purchase powers are an important tool for local authorities and other public bodies ("acquiring authorities") to use as a means of assembling the land needed to help deliver environmental, social and economic change. Used properly, they can contribute towards effective and efficient regeneration, placemaking, the revitalisation of communities, and the promotion of business, leading to improvements in the quality of life. Acquiring authorities possessing compulsory purchase powers (at whatever level) are encouraged to consider using them proactively where the acquisition of land cannot be achieved by agreement to ensure real gains are brought to residents and the business community without delay.

7.9.3 A circular has been produced by the Welsh Government which specifically refers to compulsory purchase for the purpose of providing active travel routes, key sections are outlined in table 7.3.

Table 7.3: Relevant sections of the circular relating to compulsory purchase of land for active travel purposes

Paragraph	Text
Section G Paragraph 26	CPOs which are made to acquire land for the purposes of facilitating an active travel route will carry a strong public interest case for the promotion or improvement of the environmental and social well-being of an area. The proposals are usually the result of prior public consultation, demonstrating demand and support.
Section G Paragraph 28	The nature of active travel, however, is that any given walking path or cycle route may have an alternative which can circumvent the need to acquire land/individual properties via a CPO. Acquiring authorities should always consider and undertake an assessment of suitable alternatives as part of the planning process for a CPO. This will help address any potential alternative proposals which could be put forward by objectors. In some locations there may be no other suitable alternative routes, due to physical or geographical reasons, and acquiring authorities should make reference as to why this is the case.

Paragraph	Text
Section G Paragraph 24	If an alternative proposal is made by an objector to a CPO, the decision maker should consider the alternative put forward and evaluate it when judging whether there is a compelling case in the public interest for the CPO. However, the decision maker is not bound to favour an alternative on the basis that it is less intrusive than the scheme proposed. Alternative proposals may not be preferable if they are: (1) uncertain in their delivery of the objectives which underpin the public interest basis for confirming the CPO, for example because they do not secure the delivery of the objectives of the acquisition scheme in the public interest, lack the relevant permissions or consents, or generally lack certainty in the delivery of relevant proposals in the public interest; (2) will delay the implementation of the CPO scheme where a timely delivery of the proposals is in the public interest; or (3) will not deliver the public interest benefits of the CPO scheme as well or as effectively as that scheme, or in the timely manner of the scheme where that difference in delivery of benefits and timing are material ones having regard to the public interest.

7.10 Innovation and experimentation

7.10.1 The challenge of reallocating highway space in our towns and cities is leading practitioners towards use of new and innovative ideas. Welsh Government policy, Manual for Streets and Manual for Streets 2 requires that street design should not follow the conventional engineering-led approach.

7.10.2 The development and trial of more innovative infrastructure for walking, wheeling and cycling will be essential if Wales is to achieve a step change in the amount of people using active travel modes. This guidance aims to support both innovation and well-established techniques. The design elements contained within the guidance are introduced in section 7.11, below. This third edition (2026) of the guidance incorporates changes in design practice arising from changes in best-practice and technical guidance across the UK home nations, as well as incorporating feedback from a wide range of users of the infrastructure described in this document and the organisations that represent them.

7.11 Design elements

7.11.1 Appendix G consists of a set of 'Design elements', which provide concise instruction, including dimensioned drawings where appropriate, on the layout and use of particular types of design solution. Further information on these infrastructure measures are included within chapter 11 and chapter 12.

7.11.2 Within this document, these design elements denoted as Standard Details will be regarded as "standards" for the purposes of section 2(6) and 3(6)(a), of the Active Travel (Wales) Act 2013.

7.11.3 With reference to the need for infrastructure to be supported by effective behavioural measures (see section 7.1.1), the delivery of any active travel infrastructure will require careful monitoring by the highway authorities who implement them, to ensure that they perform as expected. Welsh Government welcomes feedback on any lessons learned to improve the guidance and to assist other highway authorities that are developing innovative schemes.

7.11.4 The terms 'absolute minimum' (or "maximum") and 'desirable minimum' (or "maximum") are used throughout this technical guidance. Desirable values are the minimum level for best practice provision which should be provided whenever possible. Absolute values should only be used if there are no viable alternatives and only for short sections. In both cases, the designer should keep an audit trail of decisions made to justify why the best practice level of provision cannot be provided. Appendix L provides a template for a Design Decision Log. Any proposed infrastructure outside absolute values should seek a discussion with Welsh Government and Transport for Wales Active Travel Hub before it is proposed.

7.11.5 It is also recommended that any design decisions that do not meet the ATAG requirements are reviewed by an impartial third party with ATAG knowledge and experience, such as Welsh Government or Transport for Wales, so as to provide oversight and reassurance to the project team and key stakeholders that the decision is justified. Any proposed infrastructure below absolute minimum should not be developed or constructed.

7.12 Keeping standards up to date

7.12.1 Guidance on the design of walking, wheeling and cycling infrastructure is constantly evolving. The intention is that this guidance will be updated to take account of changes to design standards, new legislation or experience learnt from those implementing the solutions contained within the document. This is expected to result in changes to the main guidance document and the status of some design elements, as experience is gained, together with the addition and/or deletion of others.

7.12.2 User views are essential for the successful evolution of this document and so all who use this guidance are encouraged to submit comments. These comments should be emailed to the following address: activetravel@wales.gov.uk



Chapter 8: Placemaking

This chapter introduces 'placemaking' and provides guidance on how a placemaking approach can elevate the experience of walking, wheeling and cycling.

It summarises the **Placemaking Wales Charter** and the role of local Placemaking Plans in Wales.

It then focuses on four key elements of placemaking:

- legibility.
- green and blue infrastructure.
- places to sit.
- play.

For each it provides more detailed guidance and case studies by way of illustration.

8.1 Introduction to placemaking

8.1.1 Planning Policy Wales, states: **"Sustainable placemaking is an inclusive process, involving all of those with a professional or personal interest in the built and natural environment"**. Placemaking therefore should be considered a multi-dimensional process that engages with local communities and the spatial context towards a coherent sense of place that elevates the human experience.

8.1.2 Factors that contribute to the experience of place are broad and include, for example, the types of uses and activities, the ease of navigation and whether there are places to sit and rest. All these factors come together to determine whether an area feels safe, comfortable, direct, coherent and attractive to walk, wheel or cycle through (see active travel design principles in chapter 9).

8.1.3 A placemaking process starts with a thorough analysis of the existing spatial context and aims to be responsive to both local and strategic challenges and opportunities.

8.1.4 Designers should integrate placemaking considerations into the earliest stages of the design process. This includes identifying relevant initiatives, developing spatial strategies and engaging with local stakeholders from the outset. Early scoping provides a clearer understanding of the necessary processes and timeframes for project delivery.

8.1.5 When planning and designing a space it is very important to consider all users, catering for accessibility and inclusion. Spaces should aim to be accessible and safe for all users throughout the day. The planning should consider how different users experience the spaces differently.

8.2 The Placemaking Wales Charter

8.2.1 Chapter 3 sets out the legislative framework that informs placemaking in Wales.

8.2.2 The Placemaking Wales Charter builds on this strengthening focus on placemaking in policy and practice in Wales and aims to provide a common understanding of the range of considerations that go into placemaking.

8.2.3 It was developed by Welsh Government and the Design Commission for Wales in collaboration with the Placemaking Wales Partnership.

8.2.4 The charter outlines six overarching placemaking principles which cover the range of considerations that contribute to establishing and maintaining good places. Table 8.1 sets out and explains the key principles.

Table 8.1: Placemaking Wales Charter Principles

Principles	Benefits
People and community	The local community are involved in the development of proposals. The needs, aspirations, health and well-being of all people are considered at the outset. Proposals are shaped to help to meet these needs as well as create, integrate, protect and/or enhance a sense of community and promote equality.
Movement	Walking, cycling and public transport are prioritised to provide a choice of transport modes and avoid dependence on private vehicles. Well designed and safe active travel routes connect to the wider active travel and public transport network and public transport stations and stops are positivity integrated. For further design principles for walking wheeling and cycling routes, refer to chapter 9.
Public realm	Streets and public spaces are well defined, welcoming, safe and inclusive – with a distinct identity. They are designed to be robust and adaptable with landscape, green infrastructure and sustainable drainage well integrated. They are well connected to existing places and promote opportunities for social interaction and a range of activities for all people.
Location	Places grow and develop in a way that uses land efficiently, supports and enhances existing places and is well connected. The location of housing, employment and leisure and other facilities are planned to help reduce the need to travel.
Mix of uses	Places have a range of purposes which provide opportunities for community development, local business growth and access jobs, services and facilities via walking, cycling or public transport. Development density and a mix of uses and tenures helps to support a diverse community and vibrant public realm.
Identity	The positive, distinctive qualities of existing places are valued and respected, the unique features and opportunities of a location including heritage, culture, language, built and natural physical attributes are identified and responded to.

8.3 Placemaking plans in Wales

8.3.1 Placemaking Plans (also referred to Town Place Plans/Placemaking or Town Centre Strategies) are a requirement for accessing funding from the Welsh Government's Transforming Towns Programme.

8.3.2 Placemaking Plans are locally led strategies, developed with local stakeholders that set out a spatial vision for town-centres across Wales. They are intended to attract investment and secure a sustainable future for towns.

8.3.3 Where Placemaking Plans have been published they can be a vital source of information around future placemaking aspirations in town-centres across Wales. They should also demonstrate how ATNMs integrate new developments with delivery of walking, wheeling and cycling schemes.

8.3.4 A good example is provided in the Pontypridd Town Centre Placemaking Plan.

8.4 Legibility

8.4.1 The term legibility in this context refers to the ease with which people can navigate and understand the public realm – including streets, spaces and routes.

8.4.2 Designers should consider legibility early in the design and planning process ensuring proposed routes are coherent and continuous (see active travel design principles in chapter 9), such as how the choice of materials can make it easier for people to use and move through a space. This should include consideration of hardscape materials, street furniture and green infrastructure. For example, a bituminous macadam surface may indicate a channel for faster movement, whilst an area of block paving defined by trees may indicate a place to stop and rest.

8.4.3 This is important as it helps people to build a mental picture of a place, which supports navigation and can make walking, wheeling or cycling through an area more intuitive.

8.4.4 People with some protected characteristics may require specific design features to support navigation, and this is covered in more detail in chapter 9.

Figure 8.1: Trees and planting can help to define seating areas



8.4.5 The public realm and in particular streets, can be complex and contested spaces. Sometimes the most effective way to make an area more coherent and legible is to simplify and rationalise what is already there by reducing the amount of signage, poles and unnecessary street furniture.

8.4.6 This approach can help make places easier to comprehend and allows the most pertinent information to be conveyed, as opposed to being lost in visual clutter.

8.4.7 Wayfinding signage strategies can help to both support navigation and enable de-cluttering by bringing together user-centred information. More guidance on signage and wayfinding can be found in chapter 14.

Case study

Castle Street, Llangollen, Denbighshire
Completed in 2021, the Castle Street Improvement project was undertaken by Denbighshire County Council in partnership with Welsh Government and Transport for Wales, following extensive consultation.

The scheme provides a more simplified streetscape, with a reduction in street clutter, widened footways, and a coherent palette of materials comprising natural stone paving. As a result, the streetscape is visually more unified and easier to navigate.

Figure 8.2: Consolidating signage on a lamp post frees up space on the footway



Figure 8.3: Widening the footway provides more space for people walking and wheeling



Case study

High Street, Wrexham, North Wales
Funded by the Welsh Government Transforming Towns programme and completed over 2024/2025, the High Street improvement project aims to enhance the experience of visiting the high street for those walking, wheeling and cycling.

Alongside restrictions on motor vehicle access, it integrates new green infrastructure and provides space for events, markets and cafe culture.

Figure 8.4: A consistent palette of materials articulates a coherent sense of place



8.5 Green and Blue Infrastructure

8.5.1 The prominence of nature is a factor in why and where people choose to cycle (Cairns, 24[1], 25[2]), and in people's walking intentions (Bornioli, 18[3]).

8.5.2 Planning Policy Wales explains the elements that make up green (and blue) infrastructure: "function at a range of different scales; from entire ecosystems such as wetlands and rivers to parks, fields and gardens at the local scale and street trees, hedgerows, roadside verges, and green roofs/walls at the micro scale".

8.5.3 Many regions across Wales have developed Green Infrastructure Strategies. Where these are available, designers should engage with these strategies and the relevant professionals early in the design process, to inform the most locally appropriate approach to integrating green infrastructure.

8.5.4 Monmouthshire provides a good example on their green infrastructure strategy, of where a green infrastructure strategy has been developed that sets out key priorities for developing its green infrastructure network.

8.5.5 When working at a neighbourhood or street level, designers should consider what green and natural assets are currently present in the vicinity and how their design proposals could provide enhanced connectivity between these assets, sometimes referred to as a 'green grid'.

8.5.6 In doing so, it will not only encourage more people to walk, wheel and cycle but also help to support nature recovery and biodiversity. This may include a variety of approaches for example managing grassland road verges for wildlife or brownfield landscapes.

Case study

Sully Primary School, Vale or Glamorgan
The school community identified the need for a safer street in front of their school to make it easier to walk, wheel and cycle.

Delivered through Welsh Government's Safe Routes in Communities Fund, the scheme successfully integrates a widened footway, traffic calming, places to sit and planted verges.

Figure 8.5: Integrating verges as part of a traffic calming and placemaking project outside Sully Primary School, Vale of Glamorgan



1 Cairns, M. (2024). Nature and cycling: A literature review. Presented at Royal Geographical Society Postgraduate Midterm 2024, Royal Geographical Society, London. See useful resources.
2 Cairns, M (2025). "I definitely choose routes actively, that will take me through nature" – The role of nature in cycling decision-making. Presented at University Transport Study Group 2025, University College, Dublin. See useful resources.
3 Bornioli, A. (2018). The influence of city centre environments on the affective walking experience, Instituto de Salud Global de Barcelona. See useful resources.

Integration of Sustainable Drainage

8.5.7 A key benefit of Green Infrastructure networks is that they naturally align and integrate with Sustainable Drainage Systems (SuDS) by working with natural processes to manage rainfall near to where it falls. More guidance on the design and construction of SuDS is provided in chapter 15.

8.5.8 In Wales, since 2019 with the publication of the new SuDS Statutory Guidance, "all new developments of more than 1 dwelling house or where the construction area is 100 square meters or more, will require sustainable drainage systems (SuDS) for surface water. The SuDS must be designed and built in accordance with the Statutory SuDS Standards published by the Welsh Ministers and SuDS Schemes must be approved by the local authority acting in its SuDS Approving Body (SAB) role, before construction work begins."

8.5.9 When bringing forward walking, wheeling and cycling infrastructure designers should consider early in the process, opportunities for integrating SuDS components as part a wider drainage strategy and with consideration to the SAB process.

8.5.10 Bio-retention rain gardens are one component or technique that can be utilised within a wider SuDS strategy. The design, construction and maintenance of rain gardens are covered in more detail in chapter 15.

8.5.11 A key advantage of bio-retention rain gardens is that they can be shaped to both respond to local constraints within an existing streetscape, and can integrate with wider design objectives such as:

- creating a planted separation strip between a carriageway and cycle track and/or footway.
- creating a kerb build-out for a pedestrian crossing or as part of traffic calming.
- providing opportunities for tree planting, to enhance biodiversity and contribute to wider green infrastructure objectives.

Case study

Integrating SuDs and rain gardens in Wood Street, Central Cardiff

Cardiff Council and partners re-imagined Wood Street in central Cardiff as a green corridor with 180 m2 of bio-diverse rain gardens, 25 new trees, widened footways and a separated route for cycling. It enhances the experience of the urban realm, providing urban cooling and places to sit. It also enables surface water run-off to be managed at source, with pollutants filtered out, significantly reducing network pressure on the combined sewer.

Figure 8.6: Wood Street, Central Cardiff



Trees

8.5.12 Trees bring a range of benefits that support people to choose to walk, wheel and cycle as set out in table 8.2. The Trees & Design Action Group provide a rich source of guidance on planting, management and applications of trees in the public realm.

8.5.13 Designers should engage with highway maintenance early in the design process to establish the most appropriate approach to long-term planning and maintenance in their local area.

Table 8.2: How trees support people to choose to walk, wheel and cycle

Benefits	How/description of benefits
Urban cooling	Trees provide shade and cooling in built up areas. This is increasingly important in a warming climate and for making walking, wheeling and cycling attractive and comfortable travel choices. Wales was the first country in the world to undertake a complete canopy cover study of all its urban areas and this identified significant potential to increase the tree canopy.
Place shaping and wayfinding	Tree planting can shape and frame areas of the urban and rural realm, for example by marking a transition space into a low-speed environment such as a town-centre. In this way, tree planting can also support wayfinding and navigation.
Traffic calming	Tree planting can support psychological traffic calming measures, for example by reducing forward visibility and creating visual narrowing, which have been shown to encourage slower motor traffic speeds (p.88 Manual for Streets).
Attractiveness	Trees bring seasonal colour, shade and sculptural beauty, which can help to attract people to an area. There are several studies from Trees for Streets that demonstrate that trees on local high streets help to increase footfall and boost local economies.
Mental health and well-being	There is also a growing body of evidence highlighting the link between living near greener areas (including trees) and mental health. This includes a (Geary et al, 2023[4]) which reported on a ten-year longitudinal study of 2.3 million adults across Wales which found that greater exposure to ambient greenness was associated with lower odds of developing mental health conditions, including depression and anxiety.

8.5.14 It takes many years for trees to reach maturity and to realise their full benefits. Therefore, designers should plan to retain existing trees and develop designs that enable this and/or consider alternative routes. Only in circumstances where all other alternatives have been exhausted, for example, no alternative routes are feasible or due to safety reasons, should a tree be removed.

4 Geary et al (2023). Ambient greenness, access to local green spaces, and subsequent mental health: a 10-year longitudinal dynamic panel study of 2·3 million adults in Wales. Published in volume 7, issue 10 of The Lancet (see useful resources).

8.5.15 In this scenario, designers should replace any mature tree lost with at least three new trees within the local proximity to where the mature tree was removed. More information on statutory processes and construction techniques when working in proximity to existing trees is available in chapter 15.

8.5.16 Establishing new trees in urban environments can be challenging. The siting of trees above ground needs to be carefully considered, to take account of a range of factors such as sightlines at crossings and widths of footpaths, to ensure they remain accessible (for information on dimensions, see chapter 9).

8.5.17 Long-term maintenance planning and engagement are also key considerations, and designers should engage with highway maintenance officers as early as possible. More information on different tree pit construction methods is provided in chapter 15.

8.6 Places to sit

8.6.1 The importance of providing places to sit in the public realm should not be underestimated. For people with limited mobility, it can be the difference between being able to make local trips by foot or not.

8.6.2 By enabling people to spend more time in a space they also contribute to making places more engaging and alive. The presence of others provides natural surveillance of the public realm, making it feel safer to walk, wheel and cycle, especially for people that might feel vulnerable in unpopulated areas, such as women and girls (see chapter 9).

8.6.3 A variety of options to stop and rest also makes walking, wheeling and cycling journeys more enjoyable and attractive, especially when places to sit are well considered and integrated within the public realm.

8.6.4 Seating should be provided at regular intervals along active travel routes. In busy pedestrian areas and key or steep routes where older and disabled people are more likely to use them, resting places should be provided at intervals of around 50m as recommended in Inclusive Mobility. Elsewhere intervals of around 100m is appropriate as recommended in Manual for Streets.

8.6.5 Guidance on the design and layout of inclusive seating is given in Inclusive Mobility and BS 8300.

8.6.6 In addition to standard height seating, lower seats are useful for people of small stature and children; and higher perches (700mm) against which people half lean and half sit are useful for some disabled people. All seat designs should enable people to easily sit and rise from them, and should include consideration of arm rests where appropriate.

8.6.7 Seating should include spaces where wheelchair and mobility scooter users can sit alongside companions, and be located so that when people are seated their feet are not in the pedestrian route. BS 8300 recommends the clear space for access to seating designated for disabled people should be 1.05 metres by 2.3 metres deep, to allow for manoeuvring a wheelchair into a designated space from the adjacent footway at right angles.

Wheels for well-being provide a useful summary guide on accessible seating.

8.6.8 Other considerations when designing and locating places to sit include:

- orientation of seating to offer a range of views or activities, for example out to sea, across a busy street or towards a distant mountain.
- elevated positions that provide opportunities to survey an area.
- a sense of refuge and protection, for example running a bench along a wall or wrapped around a tree trunk, or in front of dense vegetation is preferable, as opposed to placing a seat in an exposed location in the centre of a space.
- opportunities to provide shelter, shade and protection from rain, wind and sun, for example placing a bench under a tree.
- the path of the sun over the course of a day in winter and summer time.
- adaptable seating to accommodate different sized groups including those with limited accessibility.
- a range of options, including arrangements to support socialising as well as quieter and calmer places.
- minimum dimensions and desired lines for footways and cycleways that consider the envelope of space required when a seat is in use.
- sufficient lighting, so that benches can be used by everyone at different times of the day and evening.
- scope for multi-functional use, for example the location of a bench can in some situations forgo the need for bollards, to prevent pavement parking or to prevent access to a potential hazard like a recessed rain garden. They can also be designed in combination or proximity to cycle parking.

Figure 8.7: Seats that create a sense of refuge and provide wide views will attract people



8.6.9 Traditional wooden benches with back and arm rests will be familiar and preferable for many users. However, there are a variety of seating typologies which may be appropriate in different contexts including:

- places to eat/picnic tables (including wheelchair accessible picnic tables).
- terraced or amphitheatre style seating incorporating changes in levels.
- extended plinth style seating.
- wall mounted seating.
- reclining seats/sun loungers.
- curved seating.
- seating incorporating planters.
- parklets – conversion of underutilised carriageway space into seating areas.

8.6.10 Designers should identify opportunities to enable resting points as an integrated part of the public realm. For example, where a boundary wall is planned, there may also be opportunities to install wall-mounted seating, or by ensuring there is appropriate depth and height, it can act as an informal place to sit. Anti-social fixtures and fittings, such as spikes to design out sitting should be avoided.

8.6.11 More seating should be considered where people congregate, such as public squares, local shopping parades and schools. Extended seating along edges or to frame spaces, can provide extra capacity at times of high demand, without looking out of place at quieter times. By integrating seating with other features in the public realm, it also ensures an efficient use of space, which could be particularly relevant in areas with constrained space and where there is a need to ensure sufficient passing widths for those walking or wheeling.

Figure 8.8: A bench in front of a tree makes for an attractive place to sit

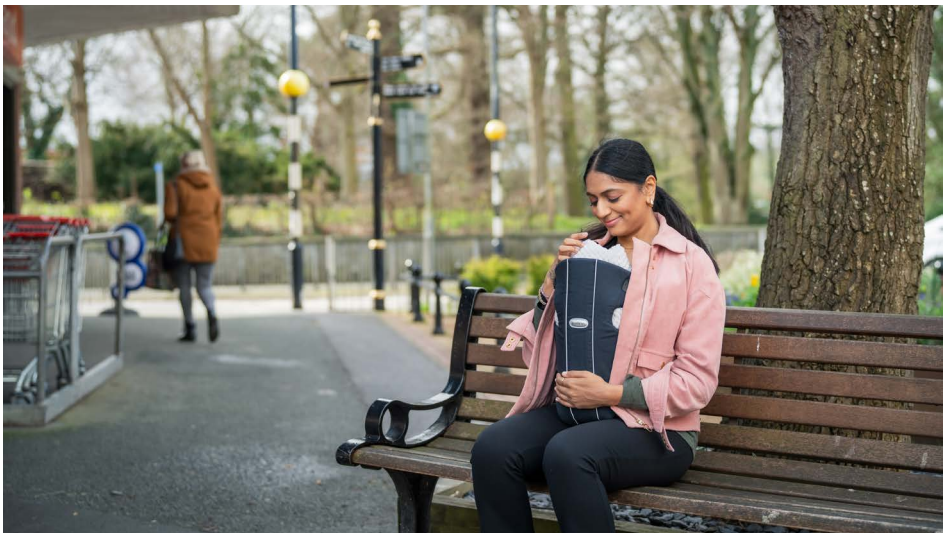


Figure 8.9: Seating can help to define the edges of spaces and maximises space efficiency



8.6.12 The palette of materials incorporated into seating can determine the level of comfort. Sitting on natural materials such as wood is often preferred by users, whilst metal can be become cold in winter and too hot in the summer. The palette of materials can also influence the sense of place, for example, more formal civic spaces might have more traditional upright bench seating, whilst for a more naturalistic and tranquil space designers may opt for natural or reclaimed materials with picnic style seating alternatively, bright colours can bring vibrancy and playfulness, suited to a location near a school or playground (see chapter 15).

8.7 Play

Figure 8.10: “Playing helps us stay healthy and feel good”



8.7.1 Chapter 3 covers the key legislative context and obligations on local authorities in Wales with regards to play assessment and provision.

8.7.2 Play is fundamental to the experience, growth and development of every child, and therefore every adult too, and integral to the well-being of the people of Wales. Creating opportunities for play, is about spatial justice for children and their fair and just access to the public realm.

8.7.3 A Ministerial Review (2023) concluded that there has been a decline in children’s play in the public realm, due to increased stationary and moving motorised traffic on our streets and public perceptions of street safety, among other reasons. This has been to the detriment of children’s independence, and physical and mental well-being (Ferguson, 2018[5], Gill, 2007[6]).

Therefore, reinforcing active travel and restricting motorised traffic, will help to create opportunities for play and support children to feel more confident to walk, wheel and cycle.

8.7.4 ‘Play on the Way’ is an approach that advocates for integrating play, in and around walking, wheeling and cycling routes.

8.7.5 According to the general comment n. 17 (2013) from the UN Committee for the Rights of the Child, play can be split into two broad categories, structured and unstructured:

- **Structured play** – play that is organised and has goal-orientated activities. These are usually guided by adults and have rules and order to create an educational and safe environment for play. It can be, for example, creating activities for children to play, but can also involve infrastructure that steers play in certain directions.

5 Ferguson, A (2018), Playing out: a grassroots street play revolution. Volume 3, Issue 1-2: Cities & Health Child-friendly cities (see useful resources).
6 Gill, T. (2007). No Fear: Growing up in a risk averse society (see useful resources).

- **Unstructured play** – play that is unorganised and allows for free play. It often doesn't require specific infrastructure but allows children to be creative and imaginative. For example, school streets where the street outside a school is temporarily closed off to motorised traffic, but allows children a space to creatively play.

8.7.6 The possibility of play can be both supported or restricted by three main themes:

- **Time** – children's 'free' time (both objective and children's subjective perception) when they can become immersed in playing.
- **Space** – how public space can support or constrain children's ability to play as well as access to designated spaces for play.
- **Permission** – children's subjective experiences of time and space, including factors such as a sense of freedom, permission, belonging, fear and harassment, as well as the increasing adult appropriation and control of play.

8.7.7 Designers should identify ways to include opportunities for play in scheme development.

Integrating Play on The Way

8.7.8 Play is an activity found in a variety of settings, in deciding where to locate playable features or create safe spaces for play, designers should consider what current play activity is or isn't currently happening in an area, as well as what local opportunities exist to create playable environments. Therefore, designers should liaise with local authority teams tasked with completing the local Play Sufficiency assessment.

8.7.9 In planning for walking, wheeling and cycling, designers should also consider carefully the 'appropriateness' of play. On a case-by-case basis, through a route assessment. This should include identifying hazards, evaluating risks and potential control measures. This assessment should consider the anticipated level of use, including interactions between user groups. Some locations, such as busy commuter routes, may not be appropriate places to encourage play. ROSPA provides useful guidance around undertaking risk assessments for play areas.

8.7.10 Another key element in creating appropriate and safe play spaces is engaging with the local community and with children of all ages. Hyper-local engagement and assessments should be completed to understand the local context (see chapter 5).

8.7.11 A useful checklist of initial questions is provided below:

- Where is play happening and why?
- Who is playing? What ages, gender and other demographics are obvious?
- What kind of play is happening? How can this be supported?
- Are there opportunities to include play? Formally/informally?
- Why is there no play?

Design scoping

8.7.12 When designing opportunities for play, authorities should consider that spaces are designed for everyone, different genders, younger children and teenagers, those who are neurodivergent and neurotypical. These spaces should be safe, educational, accessible, inclusive and attractive.

8.7.13 Opportunities could be designed specifically for play, or could consider where simple interventions can create playable opportunities, for example stepping stones in a green space parallel to a walking, wheeling and cycling route.

8.7.14 Public space lessons: Designing and planning for play (2008) is a useful resource in exploring design ideas and Make Space for Girls has helpful advice for designers to ensure spaces are inclusive for girls. Addressing some of these inequalities benefit not just girls but many people from many different demographic groups (Walker and Clark, 2023)[7].

Table 8.3: Checklist for designing play spaces

Safety	Features	Education	Inclusion
Neighbouring uses in areas with opportunities for play provide natural surveillance.	Nature, planting, trees and access to a variety of natural sensory stimulation.	Play features for the senses: smell, touch, sound, balance and sight.	Accessibility for children with disabilities, where children of all abilities can play together.
A place away from motorised traffic.	Shade and shelter.	Opportunities for children to learn and be creative and imaginative.	Spaces that meet the needs of young people or adults from different genders.
Spaces where young children can be supervised whilst also being independent.	Play features that adapt to different seasons.	Opportunities for children to be independent whilst also learning about safety.	Spaces meet the needs of neurodivergent children, such as quiet spaces and sensory gardens.
A maintenance plan for both the long term and short term.	Zones/spaces for those with different needs.	Space where children can be challenged.	Zones that meet the needs of those aged 0-3, 3-11, 11-18.
Opportunities for social spaces for parents and carers to socialise and watch over younger children.	A space that enhances and works with the local vernacular.	Blank cell.	Blank cell.

7 Walker, S. and Clark, I. (2023). Make Space for Girls the research background (see useful resources).

Design features

8.7.15 Engaging with the local community, with children of all ages, and with parents and carers in creative ways helps unlock design features. Below is a list of features and approaches that designers could consider:

- **Natural features:** logs and tree trunks to climb or run along, stepping stones, small bridges, bunds or mounds of ground at different surface heights, sand pits.
- **Sensory features:** musical play, planting with different scents, musical stepping stones, surfaces with a variety of colours and textures, quiet zones, interactive street art, such as hopscotch.
- **Play Streets:** Closing streets to motor traffic at certain times or permanently, allowing children to play freely and safely. See toolkits from Play Wales: How to organise playing out sessions on your street (resident manual) and Opening streets for play (toolkit for local authorities and partners).
- **Other features:** Interactive information boards, educational signage integrated into the public space, sheltered areas, small tunnels, tight rope planks, colourful seating, water features, gymnastics bars, street art, interactive art installations, positive signage.

Case study

Rhos on Sea Promenade

Rhos on Sea Promenade is a walking, wheeling and cycling route, away from motorised traffic, that follows Penrhyn Bay on the seafront. Play zones have been created along the route. This includes musical equipment including pipes, drums, sound reflectors and a 'floor is lava' obstacle course. Both spaces offer different types of play for different needs and allow children to play in structured environments away from motorised traffic.

Figure 8.11: Children can play safely in play zones designed next to Rhos on Sea walking, wheeling and cycling route





Case study

Fairfield Primary, Penarth. Walk Wheel Cycle Trust

Fairfield Primary launched a school street project where they closed off the street to motorised vehicular traffic, to support children and parents to walk, wheel and cycle to the school gates. Due to the success of the initial closing and a process of extensive engagement with the school children, parents and residents, the path outside the gates has been widened, the street has permanent rain gardens and is regularly closed off to vehicles, allowing children to play freely and creatively.

Figure 8.12: A widened footway provides a safer space for children to use





Chapter 9: User needs

This chapter sets out the basic needs of people when they make journeys whilst walking, wheeling, or cycling, recognising the diverse characteristics of different user groups which infrastructure planning and design needs to reflect.

Key considerations include:

- designing for the dynamic envelope of people walking, wheeling, and cycling.
- considerations which need to be made in the design process for the increased popularity of e-cycles and larger non-standard cycles (including adapted cycles).
- aiming for routes that separate people who are walking and wheeling from those who are cycling.

9.1 Similarities and differences

9.1.1 The following characteristics (also known as active travel design principles) summarise the needs of people walking, wheeling, and cycling. Active travel routes should be:

- coherent.
- direct.
- safe.
- attractive.
- comfortable.

9.1.2 Walking, wheeling, and cycling share many similarities, including many of the barriers to uptake, such as concerns over safety and poor, or missing infrastructure.

9.1.3 There are also important differences between walking, wheeling, and cycling for design purposes. People who are walking, wheeling, and cycling have distinct needs which require different approaches to planning networks and designing infrastructure. In some specific circumstances, people walking, wheeling, and cycling can share the same space safely and effectively, and the design of such areas is covered in section 11.6.

9.1.4 Ideally, when planning and designing new routes, separate facilities for walking, wheeling and cycling should be provided and with adequate space to accommodate forecast growth in users. This will reduce the likelihood of conflict and improve actual and perceived user safety and comfort.

9.1.5 Walking and wheeling are most suitable for journeys of up to two miles. Cycling can offer quicker journeys for these shorter trips, and is also convenient for longer journeys, typically of up to five miles for regular utility journeys (although e-cycles can drastically increase the distances covered) (see table 4.1). People may use several modes of transport within a single journey (known as 'multi-modal' travel), including an active mode. This is explored in further detail in chapter 13.

9.1.6 Improving conditions for one mode of active travel should not compromise another – for instance, converting a footway into a shared use path or narrowing it significantly to create space for off-carriageway cycling can negatively impact accessibility and safety for people walking and wheeling. Local authorities should always aim to improve conditions for all active travel modes when developing schemes.

9.1.7 Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 7.2) to allow desirable minimums to be provided for people walking, wheeling and cycling, as per the sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics, and local wheeling, walking and cycling movement requirements (in that order of priority).

9.2 Principles for user needs

9.2.1 Adhering to the following principles will help ensure active travel projects accommodate user needs:

- develop ideas collaboratively and in partnership with communities and groups representing vulnerable people.
- facilitate independent walking, wheeling, and cycling for everyone, accommodating the needs of an unaccompanied child, someone pushing a double-buggy, using an adapted cycle, or a less experienced cycle or mobility aid user.
- design places that provide enjoyment, comfort, and protection (see chapter 8).
- ensure access for all and equality of opportunity in public space.
- ensure all proposals are developed in a way that is context-specific and evidence-led.
- schemes should separate people according to mode: one space for people walking and wheeling, another for people cycling, and another for those driving motor vehicles. The level of active travel provision is explored further in chapter 11.

9.2.2 Figures 9.1 and 9.2 are examples of two significantly different levels of separated provision for walking, wheeling, and cycling. Figure 9.1 shows the segregation of different active travel modes and separation from motor vehicles through the reallocation of road space for the provision of a two-way cycle track. Figure 9.2 shows the separation of active travel modes from motor vehicles through provision of a shared use path through an urban park.

Figure 9.1: Separated cycle track, Cardiff



Figure 9.2: Shared use path within park, Cardiff



9.2.3 In areas where separation from motor traffic is unfeasible, it may be possible to improve conditions by removal of through traffic along the route or other appropriate traffic calming means, such as via modal filters, quiet street (DE205) or cycle street (DE206) provision. This can be particularly beneficial for residential areas where access by motor vehicle is still required (for example, for residents, emergency vehicles, refuse vehicles and where the 85th percentile speed is less than 22mph).

9.2.4 Figure 9.3 shows a modal filter and an uncontrolled crossing that maintain filter permeability for people walking, wheeling and cycling, while restricting movement for motor vehicles. In this specific case, as per best practice, the area was build out to improve visibility and parking restrictions were introduced to avoid vehicles obstructing active travel movements.

Figure 9.3: Modal filter, Cardiff



Figure 9.4: Cycle street, Cardiff



9.2.5 Such interventions have wider benefits than just increasing the attractiveness of walking, wheeling, and cycling, such as improved local air quality, reduced noise pollution, improved sense of community, and a safer environment for children to play and travel autonomously.

9.3 Inclusive design

9.3.1 Under the Equality Act (2010), public sector authorities have a duty to make reasonable adjustments to the built environment to ensure the design of new infrastructure is accessible to all. As defined within the Act, the requirement for inclusive design applies to:

- People who walk.
- People who use pedal cycles, other than pedal cycles which are motor vehicles for the purposes of the Road Traffic Act 1988, and
- Disabled people not within paragraph (a) or (b) who use motorised wheelchairs, mobility scooters or other aids to mobility.

9.3.2 Disabled people may need to use mobility scooters, wheelchairs, adapted or non-standard cycles (such as tricycles, quadricycles, or hand cycles; see figure 9.5), which require the careful design of facilities to allow for their greater width and turning space requirements to be accommodated.

9.3.3 The Social Model of Disability asserts that people are disabled by societal barriers such as physical, organisational, and attitudinal obstacles, rather than by their medical conditions or impairments. This model has been adopted by the Senedd Cymru since 2002, and should be used by all public service providers.

9.3.4 There is a misconception that only non-disabled people cycle or want to cycle, partly due the underrepresentation of disabled people in cycling planning. As a result, cycling infrastructure often fails to meet their needs or accommodate their cycles.

9.3.5 A survey from Wheels for Well-being, where 96% of the participants were disabled or were responding on behalf of a disabled person, found that 87% of respondents owned a cycle and that 59% described their cycle as a mobility aid (even though it is not currently recognised as such in law). The survey also found that the key barriers to cycling for disabled people are inadequate infrastructure, limited parking and storage, high cost of adapted cycles and poor availability of hire options, especially for adapted cycles.

Figure 9.5: People using adapted cycles



9.3.6 The provisions of places to rest, such as seating is very important for people who are older or those with physical disabilities, but it is also important for other users as it makes the spaces more engaging and populated (see section 8.6).

Figure 9.6: A range of seating options grouped together to suit different users



9.3.7 Disabled people are not a homogeneous group. Disability, as with all protected characteristics, is intersectional and it is important that a diverse range of needs and characteristics are accounted for throughout the design process.

9.3.8 Environments which accommodate the needs of disabled people will also be helpful to others. For example: ramps will help people wheeling a buggy or a wheeled bag; seats will turn the space more welcoming to everyone; routes which pass close to or provide clear signposting to accessible public toilets will be particularly important to disabled users, but also useful for other users, especially people with young children.

9.3.9 There is a correlation between likelihood to use active modes and certain protected characteristic groups, with evidence supporting that sex, gender reassignment, disability, race, and age all impact on a person's likelihood to use active modes. This correlation is particularly evident when comparing cycling levels.

Transport for Wales have developed a specific guide aimed at helping local authorities to increase the number of women and girls travelling by walking, wheeling and cycling.

9.3.10 Focus is often given to commuting trips at peak hours, however it is important to consider that the Wales National Transport Survey found only 25% of trips are commuting for work or education. Furthermore many people work anti-social hours and undertake shift work. So there are wide ranging journey types and times that need to be considered.

9.3.11 A person's gender influences the way they travel (see National Travel Survey), often due to different travel patterns and care responsibilities or by fear of harassment. Designing urban environments that cater for women and girls will deliver a space that works for everyone, making it more equitable and inclusive (see Creating places that work for women and girls). One way to help make sure that spaces are inclusive of women and girls needs is to conduct a Women's Safety Audit, which could be used as an input to the design process.

9.3.12 Transport for Wales have developed a specific guide aimed at helping local authorities to increase the number of women and girls travelling by walking, wheeling and cycling: Improving everyday journeys for women and girls.

9.3.13 Fear of harassment and violence is one of the main barriers for women and girls to use public spaces and chose active travel. Research by Sport England's This Girl Can campaign found that one in four women and girls (24%) said they prioritise well-lit routes, almost a quarter (23%) avoid certain areas altogether, and one in five (20%) glance behind them to ensure they're not being followed (see survey). A study from London cycling campaign also found that 9 out of 10 women experienced verbal abuse and aggression while cycling in London and for this reason 86% prefer to cycle on protected cycle spaces or low motor traffic routes. In Wales, women are still less likely to use cycling as a mean of transport than men (see national travel survey). Design features such as lighting, direct sight lines, active and passive surveillance, wayfinding, green blue infrastructure (see section 8.5), sense of place, access to facilities (see chapter 14) and good quality infrastructure, are important elements that are going to impact the perception of safety for women and girls.

9.3.14 Inclusive cycling in cities and towns, a report on how to create better spaces for everyone, from Walk Wheel Cycle Trust and Arup, included the following recommendations:

- improve road safety, primarily through protected space for cycling and low traffic neighbourhoods.
- address personal safety and harassment.
- ensure cycling infrastructure is fully inclusive.
- better integrate cycling between residential areas, trip generators and with public transport.
- prioritise infrastructure where transport options are poor, especially where this coincides with multiple deprivation.

Whilst this report focused specifically on cycling, understanding barriers to walking and wheeling suggests it is likely that these recommendations can be adapted to encourage increased uptake of walking among underrepresented groups.

9.3.15 Local authorities should follow requirements to undertake Equality Impact Assessments (EqIA) and be clear that the purpose is to ensure the impact of schemes on people's protected characteristics are fully considered, as required by the Equality Act (2010). The detail needed is linked to the complexity of the scheme, with straightforward schemes only needing a short EqIA.

9.3.16 Local authorities should follow their own Equality Impact Assessment (EqIA) processes and associated guidance. UK Research Councils also provide a template EqIA which provides useful guidance.

9.3.17 Key to achieving the above is to ensure that unrepresented groups such as disabled people (including disabled people who cycle) women and girls, and minority communities, are involved throughout the design process from the earliest stage (see chapter 5).

9.4 Minimising user effort

9.4.1 Those walking, wheeling, and cycling are moving under their own efforts, and are therefore more adversely impacted by the physical environment and seemingly minor deviations or obstructions, when compared to motor traffic.

9.4.2 The conservation of effort and momentum (particularly for people using mobility aids and cycles) should be considered. Good design enables people to travel with the minimum of effort by addressing as many of the factors that make up the physical environment as possible. Features that increase effort include: the surface material and any deformations, deviations or diversions from the shortest distance, and for people using mobility scooters, wheelchairs or cycles, frequent stopping and starting.

9.4.3 Strong head or cross winds and uphill gradients will also increase the effort required, though the effects of these can still be reduced by considered design (for example, providing zig-zag ramps or a vegetation buffer).

Table 9.1: Factors affecting effort required by people walking, wheeling, and cycling

Factors affecting effort required		Meaning	Design implications
The user and mobility equipment for example, wheelchairs or cycles	Speed travelled. Efficiency of mobility aid/cycle. Mass of user.	All these factors, taken together, means that stopping and starting require effort; much more than maintaining a constant speed. It also means that lighter mobility aids/cycles require less effort to move and that it is a good idea to maintain these in optimum working order.	Routes that are direct and allow users to maintain their speed are the most appealing to users, designers should avoid making users stop, slow down, or deviate unnecessarily from their route.
Surface quality	Resistance of the surface.	The greater the surface resistance, the harder it is to use wheeled mobility aids (this is particularly true for wheelchairs, pushchairs and small-wheeled cycles).	The quality and smoothness of the surface, and its continued maintenance, are essential for comfort and efficiency.
Gradient	Slope or crossfall.	The steeper the gradient, the more energy is required to overcome it. Excessive crossfall/cambers are uncomfortable for users and require additional energy use.	Directness of route may need to be balanced with avoiding steep gradients or providing landings (rest areas). Balancing user and drainage requirements should be considered.

Factors affecting effort required		Meaning	Design implications
Air resistance	Headwinds or crosswinds. Frontal area and drag coefficient.	Walking, pushing a mobility aid or cycling into a prevailing headwind, requires much more effort from the user. Local conditions, such as microclimate around tall buildings, can exacerbate this. The frontal area and drag coefficient of a person cycling also impacts upon this: a person sat upright, typically using 'city bikes' have to generate more power.	Designing to reduce headwind effects has not been commonplace in Wales but can make a large difference. Windbreaks using planting, trees or fences, can help mitigate the effects of strong winds.

9.5 The needs of people walking and wheeling

9.5.1 In this document, wheeling is referenced alongside walking to denote the act of undertaking a journey using a motorised/manual wheelchair or mobility scooter/aid. Where reference is made to a 'pedestrian crossing' or 'footbridge', it should be assumed that these facilities accommodate both walking and wheeling unless otherwise specified. This chapter explores the 5 key principles introduced in section 9.1 before exploring the more specific needs and considerations for people that are walking and wheeling.

Coherent (walking and wheeling)

9.5.2 It is fundamental that walking and wheeling routes allow people to easily travel from residential areas to destinations including shops, schools, transport interchanges, bus stops and other community facilities in a way which is legible and easily navigable. Features that improve coherence include:

- seamlessly connecting routes that form a logical and permeable network.
- high quality and appropriately placed signage, proportionate to the route type and likely user groups (this may include icons to depict destinations or, in collaboration with relevant representative organisations, braille or tactile embossed signage).
- appropriate and legible tactile paving provision to notify visually impaired people of any hazards or crossings.
- attractive features that overcome or reduce severance wherever possible, for example routes across busy roads, railway lines or watercourses (see chapter 8). Where possible, subways or footbridges for those walking and wheeling should be avoided in favour of at-grade crossings to avoid perceptions of danger, and reduce deviation and effort required.

9.5.3 'Healthy neighbourhoods', also referred to as 'walkable neighbourhoods', or 'low traffic neighbourhoods', (see figure 9.7) are characterised by having a range of facilities within 20 minutes walking distance which people may access comfortably on foot or with mobility aid, although it is important to note that walking and wheeling speed can vary substantially between users. The creation of mixed-use neighbourhoods with interconnected street patterns, where daily needs are within the walking and wheeling distance of most residents, have been found to result in greater levels of active travel. Studies that highlight the benefits and experiences of 'low traffic neighbourhoods' can be found in the useful resources section.

Figure 9.7: Healthy neighbourhood, Cardiff



9.5.4 Most examples of healthy neighbourhoods are focused within the suburbs of larger towns or cities, but they can also be applied in the context of settlements within the more rural counties of Wales. Many rural towns and villages will already have a range of local services within a 20 minute walk or wheel of one another, where opportunities may exist to improve or, in some cases, introduce environments that are conducive towards walking and wheeling. This is illustrated by a poll conducted by The Ramblers (2019) which found that Aberystwyth, Ceredigion, was ranked the fourth most 'walkable' settlement in the UK, with good public transport links and traffic calming interventions cited as contributing factors.

Direct (walking and wheeling)

9.5.5 People that are walking and wheeling are often moving under their own efforts and therefore require routes and networks which are direct and follow natural desire lines (see chapter 10 for walking and wheeling network planning methods). Features that improve a route's directness may include:

- reducing the distance required for people to travel between destinations, such as provision of cut-throughs within housing estates, retail, and business parks (filter permeability).
- reducing corner radii at side road junctions to avoid deviation from the desired line and reduce the crossing time. This also contributes to user safety by reducing vehicle speeds and improving inter-visibility.

- introducing blended side road entry treatments (DE605) at simple priority junctions, as well as dedicated crossing points that prioritise people walking and wheeling, where desire lines cross a feature of severance (for example, a road).

9.5.6 Many housing developments have convoluted and impermeable layouts, often driven by an understandable desire to control motor traffic speeds and flows. However, this is often delivered at the expense of providing direct routes for those walking and wheeling. Routes that reduce the distance needed to travel for active users are essential in encouraging modal shift. In Wales, developers and planners should now demonstrate how new developments actively favour walking, wheeling, and cycling movements by design (see section 3.5).

Safe (walking and wheeling)

9.5.7 Safety (both actual and perceived) is an essential user need for those walking and wheeling, both in the form of preventing physical harm through collisions with vehicles, and minimising threats to personal safety. Safety improvements can include:

- separating those walking and wheeling from the routes of other faster modes and vehicles.
- reducing vehicle speeds and flows.
- increasing the build quality and maintenance of walking and wheeling routes.
- promoting walking and wheeling routes that are overlooked by buildings or areas which are well-used.

9.5.8 Fears over personal safety can be a major barrier to walking and wheeling. Particular consideration and engagement with vulnerable users should be taken, especially with disabled people and women and girls, who will benefit the most from good lighting, adequate sightlines, and improved natural surveillance (see section 9.3). Low-level or surface lighting can be used on off-road paths to minimise disruption to wildlife and to highlight steps or changes in level. However, it should not be used as a substitute for overhead lighting, nor should it compromise people's safety.

Figure 9.8: Examples of low level lighting in Newport



Figure 9.9: Examples of low level lighting in Abergavenny



9.5.9 When considering interactions between people travelling on bicycles and people walking or wheeling, it is possible that collisions between pedestrians and cyclists may be underreported and fear of collision with a person cycling can be a barrier to some.

9.5.10 Environmental anti-social activity such as graffiti, litter or vandalism should be removed or repaired quickly, or ideally mitigated against by the provision of lighting or other suitable design features. Walking and wheeling routes should have clear exit and entrance points where people cannot be trapped, avoiding blind corners. Overhanging vegetation should be reduced to improve sight lines and to prevent it becoming an obstruction. It is also important that highway authorities work with other partners such as the police, to ensure people feel safe using walking and wheeling routes, through initiatives such as regular community policing where there is a high level of perception of risk.

Attractive (walking and wheeling)

9.5.11 Attractive walking and wheeling routes not only encourage more people to travel actively but can also contribute to the overall quality of an area and help to create an improved sense of place through the creation of more accessible public spaces. Features that may improve attractiveness could include:

- effective use of environmental features that can both improve user experience, but also act as environmental mitigation or sustainable drainage features (see section 8.5).
- ensuring design considers future maintenance of a route, and that routes are regularly maintained to the appropriate levels (see chapter 15).
- ensuring the designs are developed with the involvement of the local community to ensure local 'buy-in' for the scheme (see chapter 5).
- enhancing routes by the inclusion of formal or informal play-spaces and green infrastructure (see chapter 8).

9.5.12 Although it only references walking, the following remarks from section 6.3.1 in Manual for Streets are largely relevant to wheeling too 'The propensity to walk is influenced not only by distance, but also by the quality of the walking experience. A 20 minute walk alongside a busy highway can seem endless, yet in a rich and stimulating street, such as in a town centre, it can pass without noticing. Residential areas can offer a pleasant walking experience if good quality landscaping, gardens or interesting architecture are present'.

9.5.13 Walking and wheeling routes can deliver both a place (destination) and movement (corridor) function, although the balance between such functions may depend on external influences, such as the time of day or day of the week. A walking and wheeling route may deliver a movement function during the working week and revert to more of a place function during the weekend, for example by being used for a street market. In suitable locations, incorporating formal or informal opportunities for play through hard and soft landscaping or small items of equipment, can increase the enjoyment and with it, the likely use of a route (see section 8.7).

9.5.14 As well as encouraging active travel, attractive streets and public realm can deliver increased economic activity through increases in footfall and rateable values of high streets (see Living Streets report).

Comfortable (walking and wheeling)

9.5.15 The comfort of those walking and wheeling is influenced by a range of factors including the basic design of the route: its width as related to the number of users and the gradient and quality of the surface, as well as elements such as tactile paving, street furniture, drainage, cleanliness and lighting. Width is the key consideration for the comfort of active travel routes (see section 9.6). Other features that can increase levels of comfort for those walking and wheeling include:

- being strategic with the street furniture within the footway (remove unnecessary items and place them, away from the main flows with appropriate clearance widths and lighting provided).
- avoidance of the use of A-board advertisements which may pose a risk to older people and those with visual impairments.
- enforcement, or implementation of features that help to prevent (whilst being mindful of clearance width requirements) anti-social and illegal parking. This may include features that contribute to other aims such as street trees, planters, or play.

Figure 9.10: Cafe seating offset to the back of the footway, Abergavenny



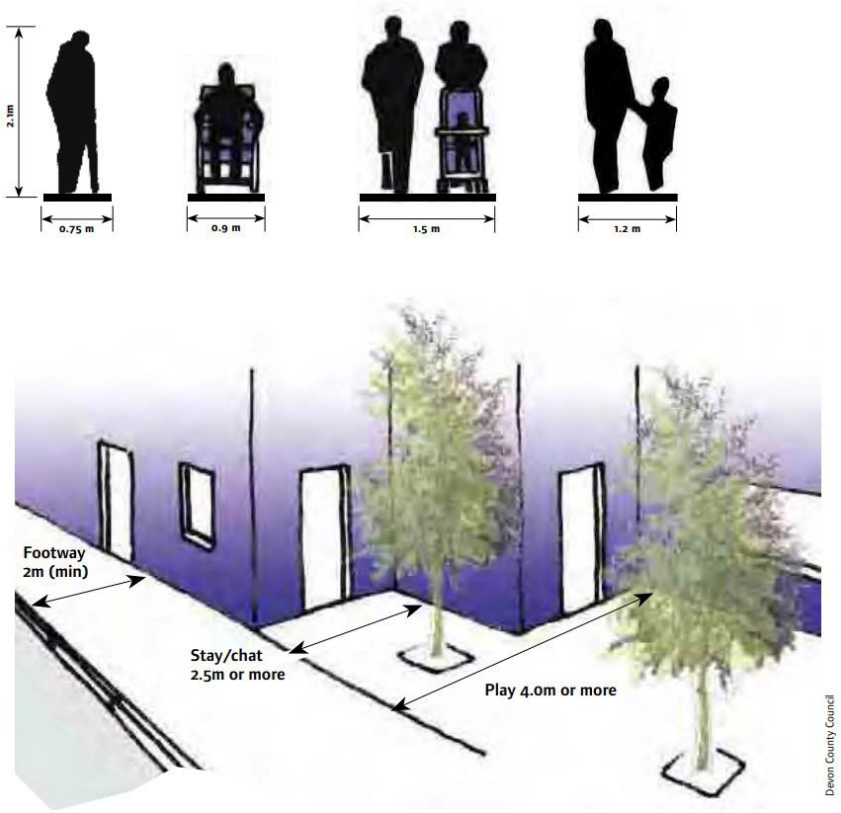
9.5.16 Opportunities for outdoor seating can contribute to an improved public realm and experience, but should not cause obstruction to those using the footway (see section 8.6).

9.6 Dimensions for walking and wheeling routes

Footway widths (DE101)

9.6.1 Basic width requirements for different types of people walking or using mobility aids are given in Inclusive Mobility and Manual for Streets which is the source for figure 9.11.

Figure 9.11: Width requirements from Manual for Streets



9.6.2 Walking and wheeling routes should have a clear unobstructed width of 2.0m (desirable minimum), which allows two wheelchair users to pass one another. Where physical constraints make this impossible, a clear width of 1.5m (absolute minimum) should be maintained to enable a wheelchair user and walking companion to travel side by side. If there is an obstacle that cannot be moved, a restricted width of 1.2m over very short distances provides space for a blind or partially sighted person to walk using a long cane, or with a guide dog, or alongside a person providing guidance.

9.6.3 In some contexts such as on public rights of way or towpaths, the minimum widths given in 9.6.2 might not be achievable. In these cases it may be acceptable to have a narrower width suitable to the context of the route, which should be recorded in the Design Decision Log (see appendix L).

9.6.4 Suitable footway width is important to allow people to travel comfortably at their chosen speed and in groups, such as when walking with younger children. For example, minimum width provision may not be suitable for areas around schools that will be used by large numbers of children and young people at the start and end of the school day. Hospitals will generate large numbers of movements of people with a range of physical, sensory or cognitive impairments and a range of mobility needs. Town Centre/retail environments may generate large numbers of users travelling in groups, at different speeds or with many crossing movements – the appropriate width should be carefully considered to support increases in footfall to these centres.

9.6.5 Further detail on the assessment of pedestrian capacity is given in Transport for London's Pedestrian Comfort Guidance for London. It defines levels of service for pedestrian capacity in terms of pedestrians per minute per metre width (ppmm) and defines area types with peak pedestrian times including high street, office and retail, residential, tourist attractions and transport interchanges. Generally a minimum level of service B+ should be achieved on all active travel routes (see figure 9.12).

Figure 9.12: Transport for London pedestrian comfort levels



9.6.6 Additional width should also be considered at locations where people move at different speeds, such as high streets, at bus stops, or where they are required to wait before crossing. This is particularly important at signal controlled crossings, where, depending on the crossing layout, users waiting on either side are likely to converge on a central island at the same time. If an island, a queue for crossing is too busy, people will be likely to cross the carriageway elsewhere (see chapter 12).

9.6.7 Beyond providing adequate space for the movement of people, successful design incorporates space for opportunities that improve the public realm such as rain gardens and spaces to socialise (see chapter 8). Additional width may be required between the carriageway and footway, depending on the speed of the adjacent carriageway. Where 85th percentile vehicle speeds are in excess of 33mph, an additional minimum 500mm width of footway or verge is recommended (see table 9.11). This is also recommended where the average of Heavy Goods Vehicles in one day exceeds 1500.

9.6.8 Such a 'buffer strip' between the walking and wheeling route and carriageway/cycle track can contribute positively to the safety (perceived and actual) and comfort of a route, and has the potential to incorporate planting or sustainable drainage features (see section 8.5). The buffer or verge also helps protect people from the air turbulence created by passing motor traffic and from debris that may be thrown from the carriageway.

9.6.9 Gaps in the buffer strip should be provided at crossing locations (and at side roads) as close to the desire line as possible, and accompanied by the correct tactile paving and flush kerb provision.

9.6.10 Additional width may also be required where busy walking and wheeling routes are bounded by a vertical feature, such as a wall, as such features may contribute to an effectively unusable section of footway of up to 500mm. For additional details, see DE101.

Visibility at pedestrian crossings

9.6.11 People walking and wheeling should be able to see and be seen by approaching traffic. Different groups will have different requirements – for example, wheelchair users and children may be harder for a driver to see because of their lower height.

9.6.12 Visibility at crossings should not be obscured or restricted by factors such as parked vehicles, trees, or street furniture. Obstacles should be moved or removed wherever possible, especially if doing so enables a crossing to remain on the desire line. If the carriageway is wide enough, it will be beneficial to narrow it or to build out the footway to provide enhanced sight lines. Street furniture such as controller cabinets should be placed in a position that does not obstruct intervisibility between people at the crossing and approaching road users.

9.6.13 Minimum distances for visibility of crossings for approaching traffic are set out in table 9.2. These are from Traffic Signs Manual, chapter 6 (section 15.5). These correspond to the Y value in visibility splay calculation for pedestrian crossings (see figure 9.17).

Table 9.2: Recommended visibility distances for pedestrian crossings

85th percentile speed (mph)	20	25	30	35	40
Recommended stopping sight distance (m)	22	31	40	51	80

9.7 Gradients for walking and wheeling routes

9.7.1 Pedestrian environments will preferably be level, as steep gradients have an impact on accessibility for some older people, disabled people, and people with pushchairs or other loads. This means, ideally gradient would be no more than 1 in 60 (1.66%).

9.7.2 When a flatter route is not possible, a gradient of 1 in 20 (5%) should generally be regarded as a desirable maximum, as steeper than this is generally defined as a ramp. A gradient of 1 in 12 (8%) should be considered the absolute maximum. The maximum gradients should only be used for short distances. With Wales being well known for its hills, valleys and mountainous terrains, there will be locations where steeper gradients cannot reasonably be avoided. At these locations, local authorities need to provide a justification for proposing steeper gradients for active travel routes, as per section 3(6) of the Active Travel Act. This should also be logged in the Design Decision Log.

9.7.3 Steeper gradients can be managed by some wheelchair users, but only over very short distances (1m or less), for example on a short ramp. Even over these short distances the maximum gradient used should be no more than 10% (1 in 10).

9.7.4 Steep cambers and crossfalls are a problem for many people, including wheelchair users. Cambers and crossfalls should preferably be 2.5% (1 in 40) with a desirable maximum value of 3.3% (1 in 30) and an absolute maximum of 10% (1 in 10) at crossings.

9.7.5 Flat landings or rest areas along gradients can be useful, particularly for those using wheeled mobility aids. These are also important in providing a rest opportunity for those travelling uphill, as well as those travelling downhill to help avoid increasing speeds. As such, Inclusive Mobility maintains that a flat landing should be provided every 500mm rise/fall when designing a ramp. Handrails should also be provided on both sides to aid users.

9.7.6 Steps without a ramp, or stepped ramps, should be avoided on active travel routes, as they are inaccessible for some users. Where alternatives are not available on existing routes, considerations are explored further within chapter 11.

9.8 Surface material for walking and wheeling routes

9.8.1 As well as contributing to the character of a street environment, the choice of surface material is important for the comfort of those walking and wheeling. Surfaces should be even, firm and slip resistant in wet and dry conditions. The maximum deviation in height should not exceed 6mm.

9.8.2 Many blind and partially sighted people are not able to distinguish contrasting colour and tone. Also, people who live with neurodivergence or dementia might feel anxious or uncomfortable in environments with too many patterns or strong colours (more information on the design of spaces for neurodiverse people can be found in PAS 6463). Footway materials should be consistent, avoiding the use of random patterns which have no meaning or purpose. Good contrast between walking and wheeling routes, cycle tracks and carriageways can help blind and partially sighted people to make sense of their environment.

9.8.3 It is vital that suitable tactile surfaces are provided, applicable to the context of the situation and in accordance with the Department for Transport (DfT) Guidance on the Use of Tactile Paving Surfaces. Further detail and summary on appropriate tactile paving options are provided within chapter 15.

9.8.4 Paving flags or block paving should be evenly laid; any unevenness can cause problems, particularly for some wheelchair users and some blind and partially sighted cane users. Cobblestones or setts should not be used unless they are flat, smooth and constructed within level tolerance.

9.9 The needs of people cycling

9.9.1 In this guidance, 'cycling' is used as shorthand to refer to the act of using a cycle, whatever the distance, speed or purpose of the journey, or characteristics of the person or type of cycle. Designs should meet the needs of everyone who cycles at any age or physical condition. Cycle routes should cater for a wide spectrum of people with different levels of confidence and experience, and those who use adapted cycles or cycles with trailers (see section 9.3 and figure 9.5).

9.9.2 People who are cycling are at greater risk of injury than those in a motor vehicle. Cycle-only injuries are often a result of poorly maintained or managed routes, whereas two thirds of collisions involving another vehicle occur at junctions, which therefore require particular attention when designing routes. The presence of high speed, high volume motor traffic affects both safety and the comfort to the user. Routes should be wide enough so that people cycling are able to comfortably cycle without risk of conflict with other users, both on and off the road.

9.9.3 As with walking and wheeling routes, cycle routes should follow the 5 key principles introduced within section 9.1. This section explores considerations for people cycling under these 5 principles, before explaining the more specific user needs/considerations for people cycling.

Coherent (cycling)

9.9.4 Cycle routes should form a coherent network; to achieve this:

- it should connect all the places people cycling want to start and finish their journeys with a route quality that is consistent and easy to navigate.

- ‘end of route’ and ‘cyclists dismount’ signs should not be installed – people using a cycle should be shown how the route continues and not all people cycling are able to dismount their cycles.
- abrupt changes in the level of provision for cycling – such as a busy roundabout which will mean that a route becomes disjointed and is not suitable for so will exclude some potential users.

Direct (cycling)

9.9.5 Routes for cycling should provide the most direct and fastest route from origin to destination. In order to make cycling preferable to driving, and reduce the risk that those cycling will choose unsuitable routes, there should be route options that are at least as direct as those available for motor vehicles. Consideration of directness should include delays caused by the need to stop and give way at junctions or crossings.

Safe (cycling)

9.9.6 Cycle routes and networks should not only improve the safety of those cycling and of other road users, but also their perception of how safe the environment is. To help achieve this:

- consideration should be given to reducing the volumes and speeds of motor vehicles to acceptable levels, particularly when those who are cycling are expected to share the carriageway (see table 11.1).
- the need for people cycling to come into close proximity and conflict with motor traffic should be removed, particularly at junctions, where the majority of collisions occur.
- complex layouts which require users to process large amounts of information (signage and marking) should be avoided. Good network design should be self-explanatory and self-evident to all road users.
- good quality surfaces are required, not least to prevent accidents and injuries.

Figure 9.13: Cycle track and footway run continuously through a side road junction



Comfortable (cycling)

9.9.7 To ensure acceptable levels of comfort for a person cycling, the following should be included:

- smooth surfaces.
- minimal stopping and starting (for example, priority over minor side road junctions).
- avoiding the need to ascend or descend steep gradients (or, where unavoidable, suitable mitigation features considered within route design).
- use of design features which minimise risk of conflict with other users (for example, separation of people cycling from those walking, wheeling, and driving motor vehicles, and with the appropriate design widths as laid out in table 9.11).

Attractive (cycling)

9.9.8 People cycling are more aware of the environment they are moving through than those in cars or other motor vehicles. The attractiveness of the route itself will therefore affect whether users choose to cycle. Routes should be appealing and be perceived as safe and usable, with the impact on people walking and wheeling (especially more vulnerable user groups, including disabled people and women and girls) considered at all stages of development. Often routes can be improved via implementation of measures that contribute to other aims, such as provision of planting that both increases attractiveness and acts as a form of sustainable drainage.

9.10 Creating opportunities for encouraging e-cycles

9.10.1 E-cycles provide battery power to drive the wheels in addition to the effort of the person cycling, up to a speed of 15.5mph. An e-cycle can greatly reduce the effort required to travel up gradients and increase acceptable distances, in comparison to a conventional cycle (see table 4.1). This means e-cycles can significantly extend the distance that can reasonably be expected to be made by cycle and compare favourably to distances that are frequently made by car. With conventional cycles, fitness and age are important factors determining use, whereas e-cycles offer opportunities to introduce new user groups to cycling. E-cycles use cycle lanes, tracks and parking spaces in the same way as conventional cycles, however their use is currently limited to those aged 14 years and over.

9.10.2 E-cargo cycles are becoming more popular, particularly within city centre areas where they are used for parcel and food deliveries. E-cargo cycles offer a viable alternative to delivery vans, particularly in urban areas where destinations are concentrated and/or motor traffic restricted. Well designed cycle routes that provide adequate widths to accommodate e-cargo bikes will allow logistics and delivery companies the confidence to reduce their reliance on vans for urban deliveries. Further consideration is available in the Walk Wheel Cycle Trust report Reinventing transport planning for E-cargo bikes.

9.10.3 E-cycles have potential outside of urban centres by making trips between outlying villages and their nearest towns possible by cycling. E-cycles therefore offer a potential for modal shift across Wales, though high quality, safe infrastructure is still required. The potential carbon savings of e-cycles is considered in this CRED report.

9.10.4 Consideration of facilities relating specifically to e-cycles (such as charging points) are described within chapter 14.

9.11 Dimensions of cycles commonly in use

9.11.1 Typical solo upright cycles for adults are around 1.8m in length and 650mm in width. Extra width is needed for moving cycles (see section 9.17 for this and other considerations regarding widths to accommodate moving cycles).

9.11.2 People using non-standard types and sizes of cycles should not be excluded from using cycle infrastructure through lack of consideration for their needs at the design stage. There are many types of cycle, (see figure 9.14) including:

- cycles with trailers.
- tricycles.
- tandems with two or more seats.
- inclusive cycles designed for disabled people such as quadricycles and hand cycles.
- recumbent cycles.
- cargo cycles (for carrying goods or children).
- small-wheeled foldable cycles.

9.11.3 Adapted (or inclusive) cycles are designed for disabled people and can be tricycles (both upright and recumbent), handcycles, tandems or upright cycles adapted to suit the rider's disability. Although the dimensions of these cycles varies, a 'Cycle Design Vehicle' has been defined which is an abstract composite of all the cycles that might reasonably use the cycle network. Designing the network around this design model ensures that it is accessible to all.

Figure 9.14: Types of cycle with dimensions



9.11.4 Table 9.3 provides the key dimensions and minimum turning circles of different types of cycle. Turning circles are based on the space required to execute a full turn, the 'outer radius', and the space required to turn around a fixed object, the 'inner radius'. For solo upright cycles, the inner radius should be at least 850mm and outer radius 1.65m, although these will require the person cycling to be travelling very slowly, for example accessing cycle parking. Larger radii are necessary where cycles will be travelling at higher speeds.

Table 9.3: Cycle and minimum turning radii

Type of cycle	Typical length (m)	Typical width (m)	Minimum turning circle (m)	
			Outer radius	Inner radius
Solo upright	1.8	0.65	1.65	0.85
Cycle plus 850mm wide trailer	2.7	0.85	2.65	1.5
Tandem	2.4	0.65	3.15	2.25
Cycle design vehicle	2.8 (max)	1.2 (max)	3.4 (max)	2.5m (3 and 4 wheel cycles)

9.12 Headroom for cycle routes

9.12.1 On cycling routes, headroom clearances can be found in table 9.4, from DMRB. Note that for new structures, the minimum headroom may be increased by 300mm where there is a risk for a reduction of the headroom such as future overlay (CD 127, cl 4.14 Note 1, DMRB).

Table 9.4: Height dimensions for cycle tracks at underbridges

Length (m)	Cycle track headroom (m)	
	Desirable minimum	Absolute minimum
Less than 23	2.4	2.2
23 or more	2.7	2.2

9.12.2 At existing structures, an absolute minimum of 2.2m may be acceptable, though in determining this, designers should consider the forward visibility of the underbridge offered by the vertical and horizontal geometry. Signs to TSRGD diagrams 530A and 530.2 should be used to warn of this low headroom, rather than 'cyclists dismount' signs, the use of which should be avoided on active travel routes.

Figure 9.15: Low headroom signage (diagram 530A), hazard strips (diagram 530.2), and associated sign plate example



9.13 Typical cycling speeds

9.13.1 The speed of different people cycling can vary widely, ranging from walking pace to 25mph or more on steep, downhill gradients.

Table 9.5: Typical speeds for cycling by type of user

User type	Typical desired speeds	Current approximate share of cycling
Child – school travel	7-15mph	10%
Adult with child – leisure	7-15mph	36%
Adult – shopping and other stop/start journeys	10-15mph	15%
Adult – commuting	10-20mph	39%

9.13.2 Although speeds do vary, the aim should always be to create facilities that suit as wide a range of people as possible, rather than providing separate networks for differing levels of cycling ability. This can be done by creating facilities that enable people to travel at the speed they wish to, with sufficient space to overtake. Cycle traffic should generally be separated from walking and wheeling to avoid conflict and allow people to cycle at a comfortable speed. This is covered in more detail in section 11.2.

9.14 Visibility dimensions for cycle routes

9.14.1 Stopping Sight Distance (SSD) is the distance required for a rider to perceive, react and stop safely. It is measured in a straight line between two points at the centre line of the route, with the line of sight lying within the highway or cycle track boundary. SSDs for people cycling at different speeds are given in table 9.6.

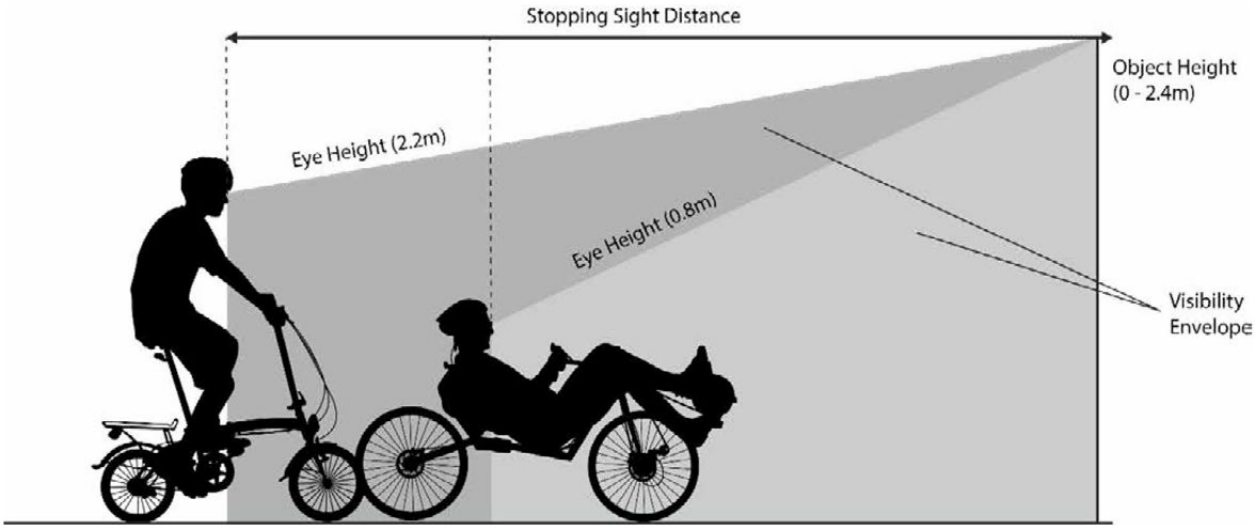
Table 9.6: Stopping site distance

Design speed (kph)	Design speed (mph)	Minimum stopping sight distance (metres)
40	25	47
30	19	31
20	12	17

Object visibility

9.14.2 Object visibility should be available over the following envelope, as shown in figure 9.16. Designers should ensure that objects between the carriageway surface and a height of 2.4m are visible from an eye height in the range of 800mm to 2.2m. These values accommodate a range of people cycling including recumbent users, children and adults.

Figure 9.16: Visibility envelope for people cycling



Visibility Splays

9.14.3 For crossing facilities shared with people walking and wheeling, such as toucan, parallel or uncontrolled crossings on shared use routes, designers should refer to figures given within table 9.2.

9.14.4 Any crossing of a highway or junction between cycle routes should be located such that all users have full visibility as shown in with figure 9.17. X distances for cycle traffic (X_1) are shown within table 9.7, with the 'Y' distances measured on the highway from the centre of the minor arm. For motor traffic, X distances of 2.4m should be considered (see section 10.5 of Manual for Streets 2).

Figure 9.17: Visibility splay

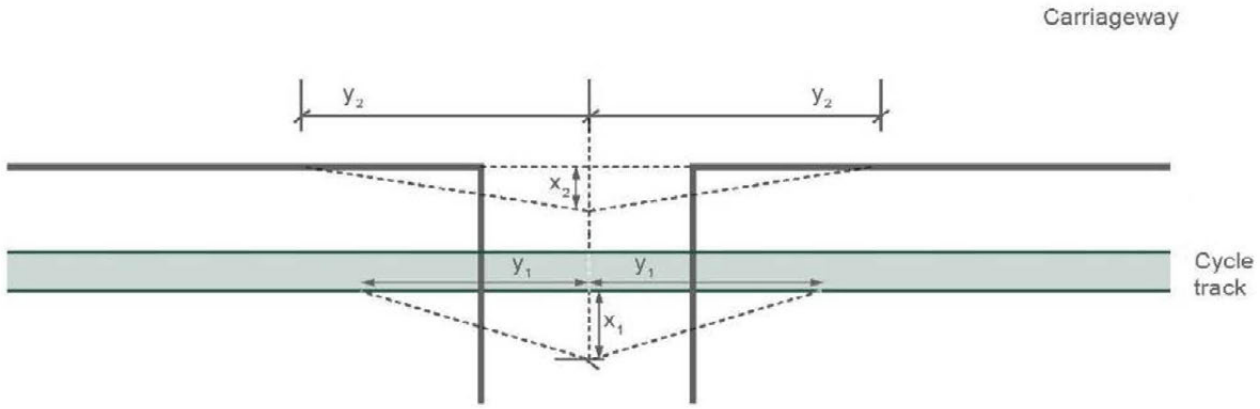


Table 9.7: X-distances (X_1) for visibility splays for cycle traffic

Desirable minimum (m)	Absolute minimum (m)
4.5	2.4

9.14.5 The ‘X’ distances for people cycling equate to the eye heights for one or two cycle design vehicles (cycles located at the junction). The desirable minimum ‘X’ distance allows two users to observe the full ‘Y’ distance and both accept the gap in traffic. Designers should therefore seek to improve visibility along the ‘Y’ distance before reducing the ‘X’ distance.

9.14.6 For ‘Y’ distances, the major arm being joined may be a carriageway with adjacent footways, a bridleway or footpath, or another cycle track. The ‘Y’ distance on a junction of two cycle tracks is the same as the SSD on the major arm (see table 9.6 for SSD).

9.14.7 If there are objects such as walls or hedges that restrict visibility where an active travel route along a main road crosses side road entrances, it is likely that drivers will edge forward and temporarily block the route while waiting to join the main road. Features that may reduce the visibility from junctions (either now or in the future) should therefore be avoided where possible at the early design stages for new routes.

9.15 Gradients on cycle routes

9.15.1 Ascending even short uphill gradients increases the effort and discomfort for those cycling considerably. Gradients are particularly difficult for people with less experience of cycling, or those using adapted cycles, which tend to be heavier and offer limited ability for short-term increases in power. Downhill gradients can lead to rapid increase in speed, which increases the risk of loss of control (particularly for heavier cargo or e-cargo cycles), and increases the difference in speed between those cycling and those walking and wheeling.

9.15.2 Routes should therefore avoid the steepest gradients if there is a suitable alternative flatter route. The maximum desirable gradient depends on length. People are generally better able to tackle short steep gradients, but even relatively gentle gradients can become difficult if they are lengthy.

9.15.3 Table 9.8, derived from the Design Manual for Bicycle Traffic (CROW, Netherlands), shows the relationship between desirable maximum gradient and the length of the incline. On an existing steep slope, it may be possible to introduce zig-zag ramps or landings to reduce the gradient even though this will extend the length of the climb. Due to the geography in Wales, these values may sometimes not be achieved, and in these cases local authorities should provide a justification for proposing steeper gradients for active travel routes, as per section 3(6) of the Active Travel Act and include evidence of engagement with affected groups during the planning and design. This should also be logged in the Design Decision Log.

Table 9.8: Relationship between gradient and length of incline (Design Manual for Bicycle Traffic – CROW)

Gradient		Desirable maximum length of gradient (m)	Absolute maximum length of gradient recommended (m)
2.00%	1:50	150	50
3.00%	1:33	80	220
4.00%	1:25	50	125
5.00%	1:20	30	80
6.00%	1:16.7	20	55
7.00%	1:14.3	15	40
8.00%	1:12.5	12	30
9.00%	1:11.1	9	25
10.00%	1:10	8	20

9.15.4 On uphill gradients, the speeds at which people cycle will decline significantly below the 10-15mph that could be expected on a level gradient. At even relatively modest uphill gradients of 3% or so, the speed achieved by a person cycling could fall to the level (typically around 7mph) at which point the stability of the cycle is reduced. The additional space needed for cycling slowly should be considered where they share space with motor traffic or people that are walking and wheeling.

9.15.5 On downhill gradients, the speed at which people cycle will rapidly increase, with a speed of 20-25mph easily achieved. Care should be taken to allow people cycling to maintain this momentum as much as possible, by increasing design speeds at the foot of slopes. Where space does not allow provision of wide lanes in both directions, it may be preferable to provide wide lanes or tracks for those cycling uphill. On the other hand, people cycling downhill are more likely to be able to maintain a speed similar to motor traffic and therefore may have less of a need for provision of cycle tracks or lanes.

9.15.6 Cycle tracks can be constructed with either a crossfall across the whole width or a central camber to help surface water to clear, but in either case the gradient should not exceed 2.5% (1:40) as this could cause wheels to slide in icy conditions (and is in line with the desirable recommendations provided section 9.7 for those walking and wheeling who may be crossing the track). Three and four-wheel cycles (and children in trailers) are particularly affected by variations in camber that can make steering more difficult and the riding experience uncomfortable. While superelevation is not typically required along a cycle route, negative camber that falls to the outside of a bend should be avoided.

9.15.7 Steps, or use of stepped ramps, should be avoided on active travel routes, as they are inaccessible for people wheeling. Where they are on existing routes, considerations are explored further within chapter 11.

9.16 Space required for cycling

9.16.1 Typically, people move side to side when cycling to maintain their balance: these lateral movements increase as speeds diminish, for example when travelling uphill. At a speed of 7mph or above, the space required by a person cycling is approximately 1.0m in width for the purposes of maintaining balance, around 200mm more than the width when stationary. This is known as the dynamic kinetic envelope.

Figure 9.18: Space requirements for cycling

Minimum clearance (not regarded by all people who cycle as safe) between a person on a cycle and overtaking motor traffic

1.5m less than 30mph

Note: these measurements are taken between the motor vehicle and the person cycling not the dynamic envelope



Table 9.9: Design minimum safe passing distance

Design minimum safe passing distance (measured from outside of person's dynamic envelope)	
Less than 30mph	1.5m
More than 30mph (see note below)	2.0m

Note: Table 11.1 advises that cycling mixed with motor traffic is only suitable for most people for 85th percentile speeds of up to 22mph.

9.16.2 The space required to cycle is normally more than the 1.0m dynamic kinetic envelope because it needs to include:

- wobble room, so that persons of all abilities have the space to cycle comfortably.
- people cycling may need to deviate from their path by around 500mm to avoid gullies or potholes at the edge of the carriageway.
- additional clearance to the position, height, width and profile of any continuous or intermittent physical barriers around pedal height, such as full-height kerb separation or light separation. Objects with a vertical profile need a wider clearance than rounded or sloping objects, and the risk of clipping a pedal is greater for higher kerbs.

- clearance to any physical barriers at handle-bar height or above, typically walls, guardrail, sign or signal poles and lamp-posts.
- separation from adjacent motor traffic lane(s) or, how close vehicles will come to encroaching on the cycling facility, which will be greater depending on the speed and width/type of vehicles moving alongside the cycles.
- separation from people walking and wheeling on adjacent footways.
- adequate separation from adjacent bus infrastructure.
- allowances for the geometry of the lane or track-cyclists require greater widths on curves, such as where the lane or track deviates around parked cars, loading bays, bus stops, etc.

9.17 Cycle tracks and cycle lanes – usage and widths

9.17.1 A cycle track definition refers back to section 329 of the Highways Act (1980). For ease of clarification within this document, cycle tracks refer to routes which are adjacent to the highway but separated by features such as a kerb, verge, level difference or material delineation.

9.17.2 Cycle lanes are defined within Schedule 1 of the Traffic Signs and General Regulations Directions. A cycle lane is defined as part of a carriageway of a road reserved for pedal cycles which is separated from the rest of the carriageway, which may or may not be used by other vehicles (depending on the associated markings).

9.17.3 A study suggested that painted cycle lanes offer no reduction in injury risk compared to no cycling infrastructure, and that advisory cycle lanes increase the risk of injury (Adams & Aldred). For this reason, these options should only be used when speeds and flows are low (refer to table 11.1) and/or in order to achieve connectivity throughout the network (at junctions or short sections, for example).

9.17.4 In most circumstances, provision of a cycle track is the preferred approach – a cycle lane is only likely to be a suitable intervention for all users where 85th percentile motor traffic speeds are less than 22mph and motor traffic flows are less than 5000 passenger car units per day. Table 11.1 provides summary on recommended levels of provision for various motor traffic speeds and flows.

9.17.5 ‘Cycle route’ or ‘cycleway’ are generic terms used in generic contexts and can mean a cycle track, cycle lane, or a shared use path, or a combination of several of these elements.

9.17.6 Table 9.10 shows the absolute and desirable minimum widths of different types of provision in relation to the peak hour flows. Designers should take into account future demand, as well as potential loss of widths of the usable track due to adjacent vertical features and drainage gullies as these will reduce the effective width.

Table 9.10: Cycle route type and desirable/absolute minimum widths

Cycle route type	Direction	Peak hour cycle flow* (one-way or two-way depending on cycle route type)	Desirable minimum width (m)	Absolute minimum width (m)
Protected space for cycling (including light separation, stepped cycle track, kerbed cycle track)	1 way	Less than 250	2.0	1.5
		More than 250	2.5	2.0
	2 way	Less than 50	3.0	2.0
		50-250	3.0	2.5
		More than 250	4.0	2.5
Advisory and mandatory cycle lanes	1 way	Any	2.0	1.5

*based on maximum active travel uptake future scenario.

9.17.7 A clearance of 500mm between dynamic kinetic envelopes enables people cycling to pass or ride alongside one another comfortably and safely. Based on the typical dynamic kinetic envelope of 1.0m, this would mean that an effective width of 2.5m is required to permit safe overtaking or social cycling. A width of 2.0m allows these activities to take place with care and should therefore be regarded as a desirable minimum on tracks designed for one-way cycling (assuming flows of less than 250 in the peak hour). With a lane or track width of 2.5m, many adapted cycles cannot overtake or cannot be overtaken without difficulty, therefore, it is recommended that sections of track or lane are intermittently widened to facilitate safe and comfortable overtaking.

9.17.8 Minimum widths should only be used where there are physical constraints that cannot be removed, and designers should aim for more generous widths to improve the quality of the infrastructure, by reallocation road space. When designers propose to use measurements outside the desirable values on this guidance, appendix L should be followed.

9.17.9 When moving in opposing directions, there is a risk of head-on collisions between people cycling. At least 1.0m clearance is recommended where peak hour flows are less than 250, giving way to a desirable width of 3.0m. Where peak hour flows exceed 250, clearance should be increased to 2m, to allow people traveling in the opposing direction to simultaneously overtake with care.

9.17.10 Shared use paths are generally unsuitable in urban areas but can offer a practical solution on low density rural and suburban routes where the flows are low and there is less potential for conflict. The network planning stages will help to assess options prior to design. A minimum width of 3.0m is recommended where people who are walking, wheeling, and cycling are invited to use the same surface (see section 11.16).

9.17.11 A minimum width of 1.5m is required between bollards, chicane barriers or at gates to accommodate the full range of cycles. It is strongly recommended that gates are avoided on cycle routes and 'kissing gates' should not be used.

9.17.12 If a cycle track cannot be provided and conditions are suitable for cycle lanes (see section 11.21 to section 11.26), a width of 2.0m will accommodate all cycles and enable riders to avoid gullies and be a comfortable distance from adjacent motor traffic. Narrow cycle lanes (less than 1.5m) should not be used as they can place people cycling in greater danger.

9.17.13 As with any form of transport, people cycling may be travelling with someone else. Many people will wish to be able to cycle in comfort side by side, particularly in the case of parents accompanying children, or when they wish to safely overtake another person cycling. If people cycling cannot overtake slower riders within a cycle track or a cycle lane they may put themselves and others at risk by cycling in an adjacent all-purpose carriageway lane.

9.18 Additional width adjacent to vertical features

9.18.1 The recommended additional space (measured from the wheel) to provide sufficient clearance to an adjacent upstand or vertical structure parallel to a cycle track/lane is:

- kerb up to 150mm high: add 200mm.
- vertical feature 150-600mm high: add 250mm.
- vertical feature above 600mm high: add 500mm.

9.19 Additional width adjacent to carriageway

9.19.1 The buffer or verge strip between the cycle track and carriageway can vary in width and can contribute positively to the quality of the streetscape with the potential to accommodate planting and sustainable drainage (see section 8.5). At crossings and side roads, the buffer should be interrupted with hard surface and dropped kerbs, to allow for people to wait and cross. A width of 1.5m will be sufficient to accommodate users of wheelchairs and mobility scooters (see Inclusive mobility).

9.19.2 The buffer or verge also helps protect those cycling from the air turbulence created by passing motor traffic and from debris that may be thrown from the carriageway.

9.19.3 In some locations existing verges and hedgerows can be dense with vegetation and be biodiverse, meaning it may be more appropriate to leave these in place and provide active travel facilities on the far side of the existing verge or hedgerow from the carriageway. Being further separated from motor traffic has the additional benefit of providing a more comfortable and pleasant user experience. When possible, this should be balanced with the need for passive surveillance and escape routes as their absence can exclude users that can feel vulnerable. In these situations, there should be an alternative route already in place that these users can use instead.

9.19.4 Minimum recommended horizontal separation between carriageway and cycle tracks for the speed limit is shown in table 9.11.

Table 9.11: Horizontal separation in relation to 85th percentile vehicle speeds

85th percentile speed (mph)	Desirable minimum horizontal separation (m)	Absolute minimum horizontal separation (m)
Up to 33	0.5	0.0
Between 33 and 44	1.0	0.5
Between 44 and 55	2.0	1.5
Between 55 and 66	2.5	2.0
Between 66 and 77	3.5	3.0

Notes:

For new developments where 85th percentile speed data is unavailable, the design speed limit should be used, and traffic calming measures may need to be implemented to ensure compliance.

(Separation strip should be at least 500mm alongside kerbside parking and 1.5m where wheelchair access is required.)

9.19.5 To enable disabled users to cross carriageways/tracks, regular dropped kerbs should be provided along the buffer strip. Alternatively, gaps in the strip should be provided where the cycle track is at carriageway level. Tactile paving should be provided following the principles of Guidance on the Use of Tactile Paving Surfaces.

9.19.6 Gaps in the buffer strip at side road junctions are also needed to enable people cycling to enter and leave the protected cycle track space (see figure 9.1).

9.20 Width considerations for on-carriageway cycling

9.20.1 In places where people cycling can be expected to share the road with motor vehicles, the width of the road profile has a profound effect on those cyclists' comfort. Those cyclists may feel uncomfortable if road conditions create a sense that they are impeding motor traffic, while drivers may become impatient if they cannot easily overtake. This may in turn lead to hazardous and uncomfortable overtaking manoeuvres (see section 11.9 and section 11.10).

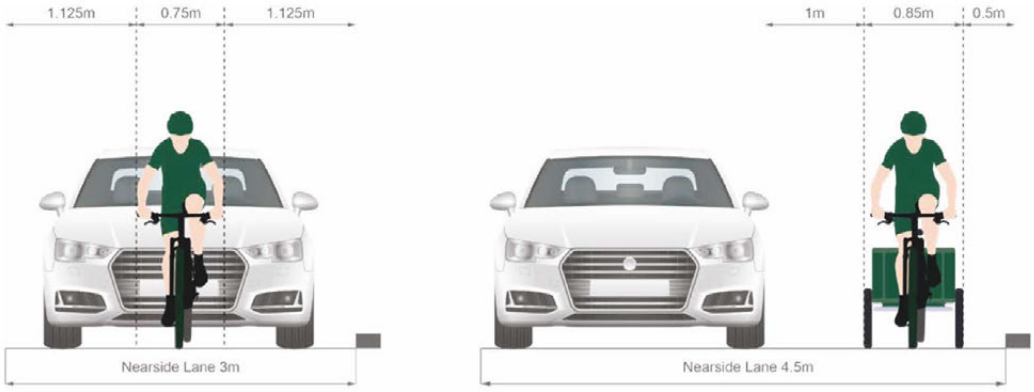
9.20.2 Designers should always be aware of the effect of their lane and carriageway width choices on people cycling, even if they are designing a route that has not been identified as an active travel route. The obligation for highway authorities to consider cycling when discharging their general functions is discussed further in chapter 2.

On carriageway cycling

9.20.3 National Standards Cycle Training in Wales provides three levels of skills, from basic cycle handling at level 1 to riding on busy roads and junctions at level 3.

9.20.4 The training recommends people cycling to adopt two main riding positions when riding on carriageways – the primary, also known as 'follow-me', and secondary, also known as 'pass-me' positions (see figure 9.19). Designers need to be aware of these riding positions and design on-carriageway cycle routes with them in mind. Table 11.1 provides guidance on when on-carriageway cycling is acceptable.

Figure 9.19: Primary and secondary road positions



9.20.5 As part of National Standards Cycle Training, those cycling are advised to adopt the primary/follow-me position, riding in the centre of their traffic lane in situations where they can keep up with other traffic, when no traffic is trying to overtake them, or when overtaking would be unsafe (including at the approaches to junctions, on narrow sections of road, or when approaching junctions or corners). When a person is cycling, the primary position simultaneously maximises intervisibility between them and other road users as well as reducing the risk of dangerous overtaking manoeuvres, particularly in safety critical situations.

9.20.6 People cycling are advised to adopt the secondary/pass-me position when motor vehicles wish to overtake them, providing it is safe for a person cycling to do so. This means those cycling positioning at least 1m to the left of the traffic stream but no less than 0.5m from the kerb or from any parked car doors. This position ensures that a person cycling is far enough out to be able to avoid drains or debris but can also move in either direction to avoid surface hazards.

9.20.7 Following this advice can be safer than other road positioning, but those who have not received training may not be familiar with it and those with less cycling experience may be nervous to adopt it. It is therefore only recommended to design active travel routes that depend on those cycling taking the primary position on streets where motor traffic volumes and speeds are very low (see table 11.1 to establish most appropriate provision for the route context).

Overtaking clearance to passing vehicles

9.20.8 The minimum clearance between a moving motor vehicle and the outside of the dynamic kinetic envelope of a person on a cycle should be 1.5m. More clearance is needed where a high proportion of motor traffic is made up of buses and HGVs, and any measurement should be taken to the furthest side extremity of the vehicle. This has implications for the design of pinch points and for the width of general traffic lanes when people cycling are sharing carriageways.

9.21 General lane widths on carriageways

9.21.1 Traffic lane widths of less 3.0m or less, or 4.0m or more should preferably be used. Lane widths in the critical range of 3.2m to 3.9m should be avoided unless motor traffic flows are sufficiently low (less than 5000 AADT and ideally below 2500) that drivers can cross easily into the opposing carriageway to overtake those cycling.

9.21.2 The effect on typical carriageway profiles is as follows (in streets with car parking the dimensions given below are based on the dimensions between parking bays).

Wide streets – 9.0m minimum two-way carriageway

9.21.3 A 9.0m carriageway provides adequate space for drivers to overtake people cycling comfortably, however, speeds can be high and more often than not too high for on-carriageway cycling. Within the overall carriageway width available, consideration should be given to the provision of cycle tracks (see table 9.10), accompanied by an adequately wide buffer (see table 9.11).

Critical width streets – 7.3m two-way carriageway

9.21.4 The 7.3m carriageway has been the default standard in the UK for many years. A 7.3m width (2 x 3.65m lanes) generally provides space for a driver to overtake a person cycling without crossing the centre line, but does not allow for any safety margin for the comfort and protection of a person cycling. Carriageways with lane widths of more than 3.2m and less than 3.9m should therefore be avoided for active travel routes, unless motor traffic flows are low and sightlines are good enough to permit safe overtaking.

9.21.5 Designers should only use 7.3m wide carriageways for active travel routes when people cycling are accommodated off the carriageway or motor traffic volumes are low. Providing narrow (less than 1.5m) advisory cycle lanes within a 7.3m carriageway is not an acceptable or recommended intervention.

9.21.6 Where an existing 7.3m carriageway is being considered as an active travel route, it may be possible to make conditions more suitable for cycling by reducing the speed and volume of motor traffic or making the carriageway into a one-way road with a two-way cycle track (4.0m plus 3.3m motor traffic lane), or if conditions are suitable for a mandatory cycle lane (see table 11.1) via combination of 2.0m lanes and removal of centre line.

9.21.7 Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

Narrow streets – 6.0m two-way carriageway

9.21.8 Narrow streets are objectively safer for people cycling as people driving are less likely to be able to overtake where it is unsafe to do so. However, such streets should be short, traffic calmed, and designed to make it clear that people using cycles have priority on the carriageway. People who are less confident on a cycle may feel uncomfortable being assertive in their use of the space.

Table 9.12: Speed limits and lane widths

Speed limit	Lane width (m)	
	Less than 5% HGVs	More than 5% HGVs
20mph	2.5 maximum	3.0 maximum[1]
30mph or above	4.0 minimum	4.0 minimum[2]

1. 3.0m maybe used if frequent traffic calming measures are present along the length of road
2. Where 85th percentile speeds exceed 30mph, this should be increased to 4.5m

9.22 Width at pinch points

9.22.1 It is important to ensure that chicanes and pinch-points have a bypass for cycles or are designed in such a way that people cycling are neither squeezed nor intimidated by motor vehicles. The preferred option is to provide enough width so that a person cycling can remain in the secondary/pass-me position and be overtaken safely. When speeds are low, the alternative is for people cycling to be automatically placed in the primary position by making the carriageway width less than 3.0m.

9.23 Surface for cycle routes

9.23.1 In comparison to motor traffic, people cycling are particularly susceptible to uneven or hazardous road surfaces, such as potholes, ruts, poorly maintained ironwork or slippery surfaces. Many cycle crashes involve no other vehicle and are due to poor surface conditions. Adverse or excessive camber is particularly difficult for users of three-wheel cycles or cycles with trailers.

9.23.2 Rough surfaces increase the effort required to cycle and reduce comfort. Routes for cycling should be machine laid to offer a surface that is as smooth (or smoother) than a carriageway. Routes near vegetation should be constructed with a properly drained surface and designed to prevent root damage. Routine sweeping, vegetation clearance and winter maintenance should be undertaken on all active travel routes, whether on or off-carriageway (see chapter 15).



Chapter 10: Network planning and map preparation

This chapter sets out the value and process of producing the Active Travel Network Map (ATNM). It includes sections on the evidence base required for planning routes and how walking, wheeling and cycling networks should be developed, as well as the audit process, prioritisation and submission of the maps.

Key areas for consideration include:

- how to develop walking, wheeling and cycling network plans.
- use of the audit tools and how to assess existing and future routes.
- preparing and submitting for approval and publishing the ATNM.
- prioritisation of the routes on the ATNM.

10.1 Introduction

10.1.1 Information relating to the legislation and process for producing and submitting the ATNM, as well as generally acceptable distances for each active mode for the purposes of network planning, is described in chapter 4. The Act requires existing and future routes to be mapped and they must be reviewed every 3 years, unless directed otherwise by Ministers.

10.1.2 These routes should connect to destinations and could be on road, shared, separated, or motor traffic free, such as greenways and routes through public spaces. Now that network maps for all settlements have reached a high level of maturity, subsequent reviews are likely to only require a light touch update, unless in exceptional circumstances. Routes can be for walkers, wheelers, cyclists, or all. Maps are also to show crossing points and the facilities that exist to support active travel on these routes, such as parking, shelters & storage and public toilets. Other facilities that could be usefully shown on the map include: seating, cycle hire locations and e–cycle charging points (see chapter 14).

10.1.3 For clarity of presentation, separate methods are given for the initial steps in planning for walking, wheeling and cycling networks, but in practice data gathering and public consultation is common across active modes. Authorities should consider when to carry out the planning tasks separately, and when to deal with all modes together. All modal networks should be ambitious and developed according to evidence based potential demand.

Existing infrastructure

10.1.4 Network planning needs to be adaptable to settlements of different sizes and demographics, which will in turn impact on the range of data required to feed in to the process.

10.1.5 Footways adjacent to roads, as well footpaths away from roads, mean that in many places there is already a comprehensive network to accommodate most walking or wheeling trips. However, the quality can often be improved to make places that are safer and more accessible to all.

10.1.6 Cycling infrastructure is usually based around the development of route networks covering a whole town or city. Design standards have undergone considerable review over the last decade, and as a result some older infrastructure is often not up to the standard that is known to enable higher levels of use.

The update to 20mph speed limits across Wales may deem certain roads now suitable for on-road cycling (subject to appropriate flows and actual speeds, see **table 11.1**).

Engagement

10.1.7 The ATNM development process (related to map development) requires local authorities to engage with those needed to make the networks a reality – politicians, engineers, funding bodies and the public, as well as partners in health, education, commercial and the voluntary sector. Engagement helps to foster a sense of ownership of the plan both within the local authority, with users and the wider community.

10.1.8 The ATNM is critical to the later more detailed design of route sections by providing the designer with an understanding of the context of a link or junction and its function with respect to the overall network.

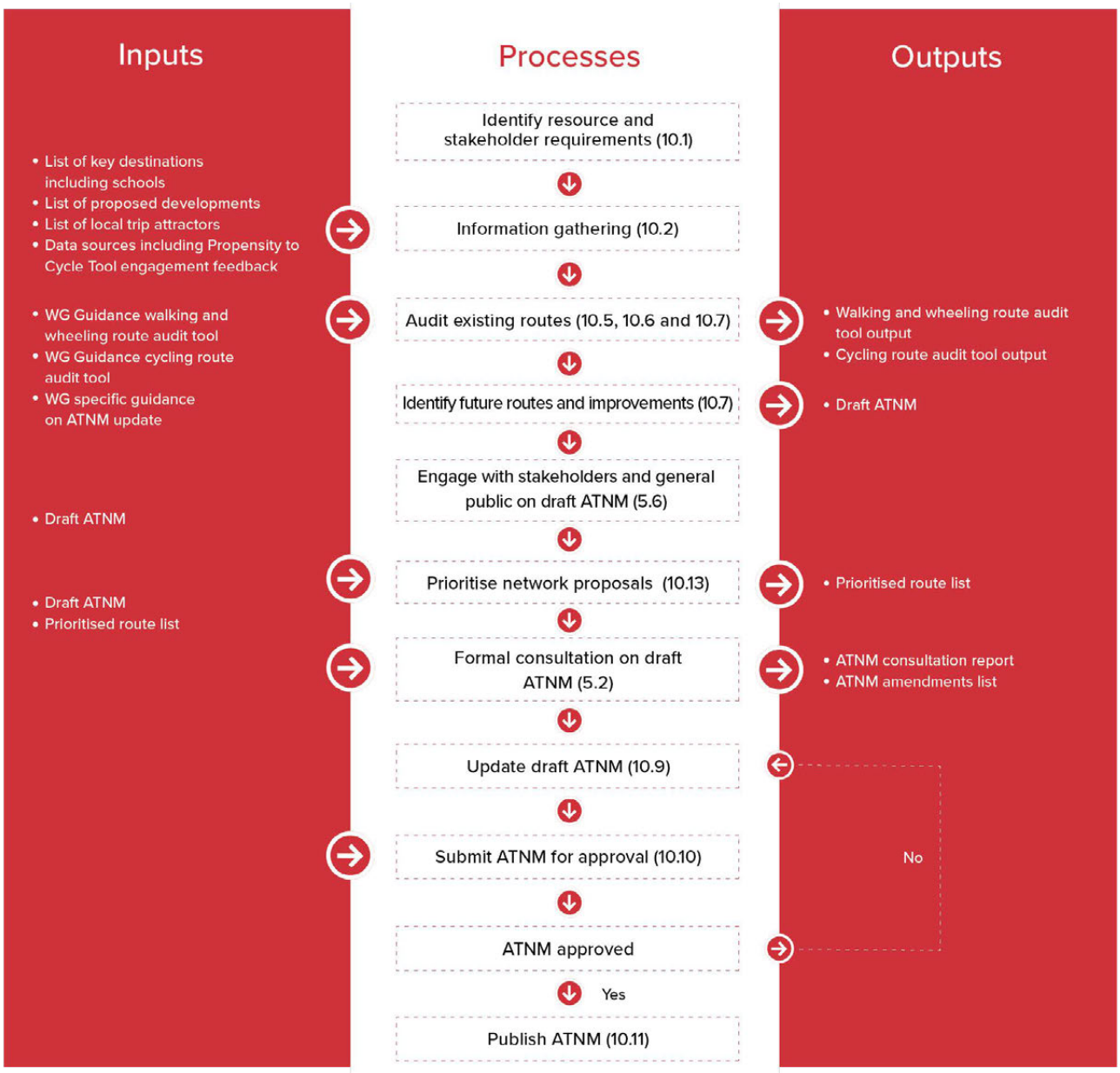
10.1.9 The ATNM enables future improvement programmes to be planned, prioritised and managed. This represents a shift from ad-hoc opportunistic provision for walking, wheeling and cycling, instead working towards the development of a logical and comprehensive network for active travel.

10.1.10 Local user knowledge is a key source of information and inputs from relevant stakeholders should be sought at all stages of the process using the techniques described in chapter 5.

10.1.11 Welsh Government provides a mapping system which local authorities should use to plot and show their ATNMs. The system also facilitates the process of submitting maps for Ministerial approval. The mapping system is hosted on DataMapWales.

10.1.12 Figure 10.1 highlights the key stages and processes that are required to develop an active travel network and the processes involved to get the maps approved.

Figure 10.1: Network planning and map preparation flowchart



10.2 Information gathering and ATNM integration with policies, plans, programmes and infrastructure

10.2.1 Integration is key to the successful delivery of active travel networks. The programme of active travel infrastructure improvements needs to be integrated with existing functions of the urban network, and with other strategic plans and traffic management measures. The ATNMs are intended to form part of strategic local transport and land use plans, and to provide evidence for funding applications and for developing work programmes.

10.2.2 Research has shown that the most successful infrastructure is delivered within a wider programme that includes political commitment, skilled delivery teams, engagement, encouragement, monitoring and promotion[1].

10.2.3 This is an opportunity to consider all relevant local authority plans, and how they will come together to improve rates of walking, wheeling and cycling across the local authority area. Individual projects that were intended for delivery along the same route could be rationalised into a single scheme. The ATNM can then indicate where planned interventions might contradict each other or render schemes obsolete. Particular attention should be paid to plans that will lead to changes in travel patterns, such changes afford significant opportunities for modal shift if appropriate infrastructure is available.

10.2.4 Local authorities should highlight key destination points on their ATNM as this provides a focus for the network mapping with the aim of facilitating journeys to these locations. These also provide reference points for map users, an outline list of destinations to be considered is included within appendix J.

10.2.5 Plans for new schools, new housing developments and/or new workplaces need to be considered when creating and reviewing the ATNM, and evidence of this having been done should be provided when the ATNM is submitted for approval by Ministers.

10.2.6 The documents, plans, audits and other sources of information to consider in this process should as a minimum include:

- strategic development plans.
- local development plans (and supplementary planning guidance).
- local or regional transport plans.
- rights of way improvement plans.
- Wales Transport Strategy and National Transport Delivery Plan.

10.2.7 It could also include other appropriate sources such as:

- local road safety plans and strategies.
- local and adjacent counties well-being plans.
- additional proposals for land-use, including housing/regeneration/commercial/industrial/education/green spaces and other relevant developments.

1 Pucher & Buehler, (2008), Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany (in italic), Transport reviews, volume 28, Issue 4, page 495 (see useful resources).

- for local authorities which border England, neighbouring authorities' Local Cycling and Walking Infrastructure Plans.
- National Cycle Network routes and aspirations.

10.2.8 The list above is not exhaustive, and some of the plans mentioned above will not be relevant for all local authorities. The key point is integration, to draw together existing plans and look for ways to maximise benefits across different policy objectives and to minimise duplication of effort where work has already been undertaken, including:

- **Modal integration:** when measures have been considered for one transport mode, the consequences for other transport modes may become clearer. This integration is of most relevance where the different transport modes interact with one another such as at junctions and interchanges.
- **Land use integration:** the effectiveness of the ATNM can be reinforced through integration with land use policy that creates developments that are conducive to active travel, and through a range of measures to encourage active travel as part of healthy lifestyles.

10.2.9 In the majority of designated localities under the Act, local authorities will be able to use previous iterations of their ATNM as a starting point for the next review process. Any review should still consider relevant processes outlined within this chapter, and should be particularly mindful of:

- emerging transport research and recommendations that have been introduced since the previous iteration of the network review (example: updates to design standards).
- built environment changes that directly influence the design of the route, such as highway infrastructure implemented since the previous iteration along the alignment.
- local context changes that have indirectly influenced route usage, for example, a nearby supermarket or modal filter that has significantly increased or reduced flows.
- updates to planned future developments that may influence uptake of active travel, for example, a new housing development on an updated Local Development Plan.
- updates to any other national, regional or local plans, policies, programmes and infrastructure.
- any issues/suggestions highlighted via the engagement process.

10.2.10 The ATNM enables authorities to consider potential sources of funds and make efficiencies by using overlaps with programmes across departments. For example, new pedestrian and cycle crossings could be installed as part of a road safety junction improvement scheme.

10.2.11 The ATNM may also highlight potential for delivery of active travel schemes through non-highway functions, such as economic development schemes, public realm and environmental management projects and new developments, including developer contributions (S278, S106 agreements and Community Infrastructure Levy funding).

10.2.12 Planning and Development Control officers should take the ATNM into account when considering planning applications, where existing or future routes pass through the site, see Planning sections in chapter 4 and chapter 7 for further details.

10.2.13 Whilst the focus of the ATNM is on designated settlements within a local authority, as required by the Active Travel Act, the principles underpinning active travel route planning are also relevant and applicable in smaller towns and villages. Planning Policy Wales states, "in rural areas most new development should be located in settlements which have relatively good accessibility by non-car modes when compared to the rural area as a whole. Development in these areas should embrace the national sustainable placemaking outcomes, and, where possible, offer good active travel connections to the centres of settlements to reduce the need to travel by car for local journeys".

10.3 Network planning for walking and wheeling

Overview

10.3.1 There is usually already an extensive network of routes to accommodate most walking and wheeling journeys and the process starts by engaging with stakeholders and the public and reviewing existing routes. The role of walking and wheeling network planning for utility trips in built-up areas is to identify and prioritise improvements to make walking and wheeling easier, safer and more attractive. An overview of the process is summarised in figure 10.2.

10.4 Network planning for cycling

Overview

10.4.1 The principles of network planning for cycling are to plan for routes which are continuous and cohesive, linking all key destinations within the locality as a complete journey so that people cycling can travel seamlessly on good quality infrastructure. Figure 10.3 outlines the process for creating the cycle network.

Figure 10.2: Network planning for walking and wheeling



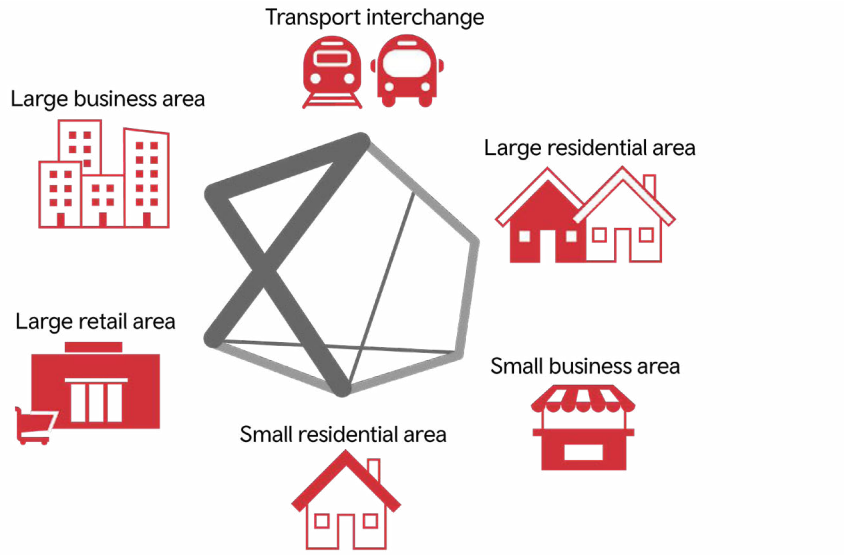
Figure 10.3: Network planning for cycling



Mesh density

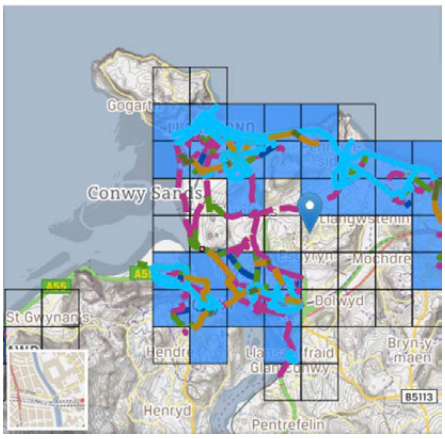
10.4.2 If a cycle network is viewed as a grid or mesh that is laid across an area, and the existing and future routes are the lines of the mesh, then the density can be measured by the distance (typically direct alignment) between those routes. This distance between routes is referred to as the "mesh width" for the basis of network planning.

Figure 10.4: Illustrative demand lines diagram



10.4.3 Mesh density (as shown in figure 10.5) can be used to analyse the coverage of existing (and future) cycle routes in order to help identify where there are gaps. It is a simple analysis of the length of cycle route within each kilometre square.

Figure 10.5: Example of mesh density analysis from DataMapWales



10.4.4 Cycling networks should ultimately be designed to have a mesh width of around 250m in central areas, with a wider mesh width of 500m in outer suburbs where the density of development is lower. Physical barriers such as hills, rivers and railway lines may affect the overall mesh density but the ATNM should include any viable opportunities to address these.

Basic network

10.4.5 These existing and planned routes will also be supported by a basic network made up of the existing roads within a settlement: residential access roads and quieter streets where the speed and volume of motor traffic allows active travellers to share space with motor vehicles (see table 11.2).

The recent update of 20mph classifications in Wales may mean that routes which were unsuitable at the previous iteration of the map submissions are now suitable, subject to other audit factors being within pass thresholds (for example motor traffic flows and actual speeds – see **table 11.1**).

10.4.6 The basic network consists of not only designated cycle routes but also the local road network where conditions meet the standards set out in this guidance as being suitable for cycling. Local authorities should make use of the cycle route audit tool (appendix H) to assess the appropriateness of designating infrastructure as part of the basic network.

10.4.7 Different thicknesses of line can be used to show the relative importance of the connections as in figure 10.4.

10.4.8 All new residential, commercial or other developments should contain provision for walking, wheeling and cycling.

10.5 Adding routes onto ATNM

Route auditing and assessment

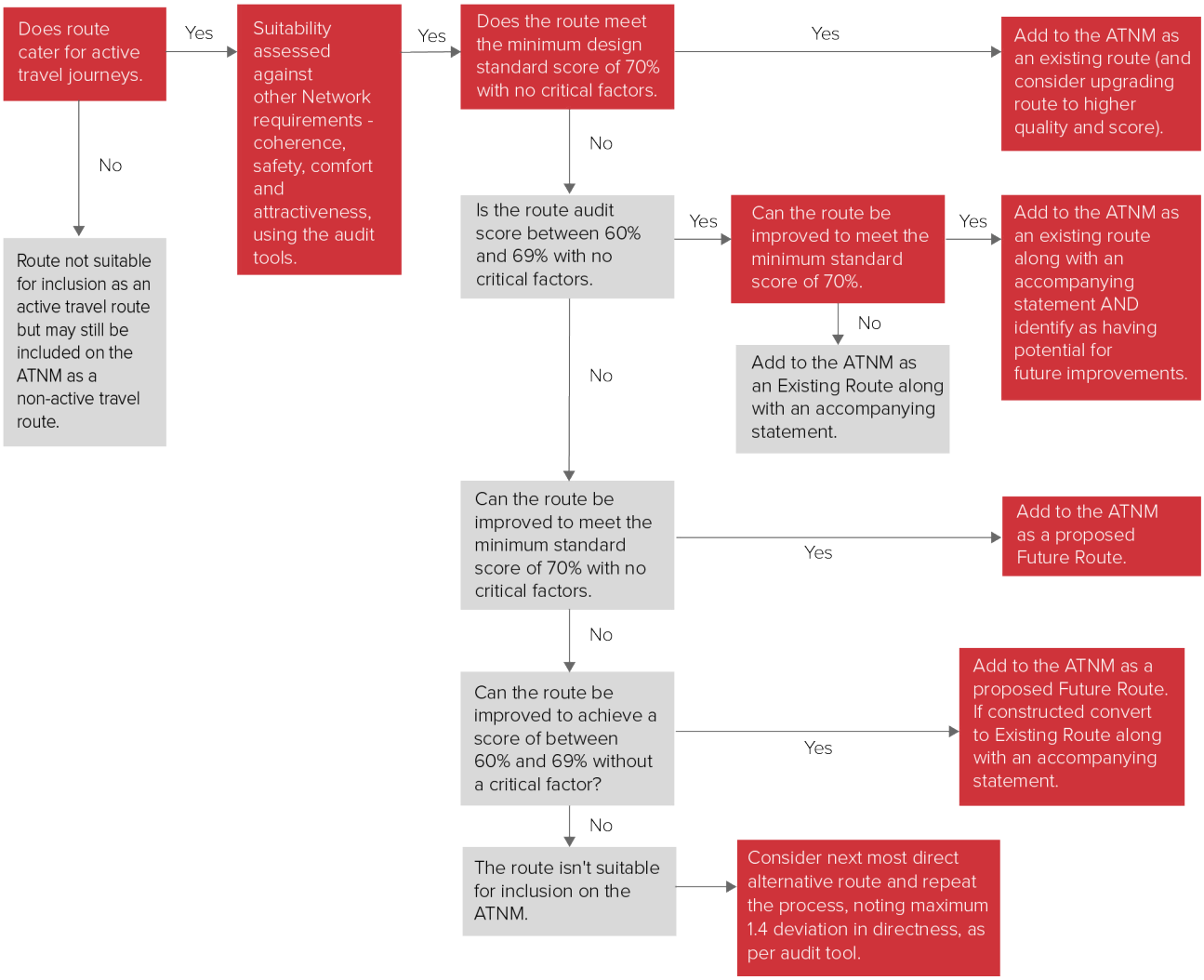
10.5.1 Findings from stages 1 to 4 (walking and wheeling – figure 10.2) and stages 1 to 4 (cycling – figure 10.3) will have provided a network of desire lines or area based treatments for active travel, applicable to either, or all active modes.

10.5.2 Figure 10.6 shows how to convert these desire lines appropriately as an existing route or a future route. Further details regarding the design standard scores are described in the section relating to the audit tools in appendix H.

10.5.3 Determination of a route as ‘existing’ or ‘future’ is assessed using audit tools provided in appendix H of this guidance.

10.5.4 These audit tools help assessors determine suitability of the route against key factors of directness, coherence, safety, comfort and attractiveness. The audit tools are intended to be used in conjunction with a site visit, and provide a means of ensuring that all factors which make up the key requirements are considered.

Figure 10.6: Process flowchart for identifying routes to be added to the ATNM



10.5.5 Even if a route has passed the audit process it could still be improved to raise the standards. If the route is not suitable in its current condition, an assessment should be undertaken to identify the works or measures that would enable it to fulfil the network requirements and the design standards. The audits for future routes are primarily concerned with identifying the nature of the issue and likely feasibility or scale of works required to meet the active travel design standard.

10.5.6 The audit process could then be repeated on the proposed design to see whether the improvements will ensure the route meets the minimum design standard. Feasibility of route options should involve the following considerations:

- there is often more than one solution – options should be considered (and consulted on) to identify the best solution for all road users, including engaging with users or key stakeholders.
- work towards the optimum solution for active travel, in line with the design principles – the aim is to make walking, wheeling and cycling on active travel routes more inviting than using motor vehicles.

- the existing motor traffic situation should be considered – this should be based on actual surveys and observations (of speed, volume, parking and loading demand, turning movements as applicable). It should not be assumed that motor traffic speeds and volumes are low in all residential streets. In congested situations or where there is kerbside activity, separation may be required despite low speeds.
- speeds and volumes of motor traffic on any route are not fixed – can one or both be reduced?

10.5.7 A high proportion of collisions involving people walking, wheeling or cycling occur at junctions. Active travel networks should ensure that there are no gaps in provision along any part of a route. Junctions should be given particular attention, as they often 'unlock' areas of quiet streets and connections to greenways (see chapter 12). The following should be considered at junctions during the assessment stage:

- speed reduction through the junction and legibility of use are crucial factors in improving safety for all users.
- junctions should be designed such that all users are aware of the potential positioning and movements of other users.
- visibility and eye contact can help different road users to communicate and improves safety.
- people walking, wheeling and cycling wherever possible should be given equal status and priority with motor traffic through priority over quieter side roads and other considerations, such as increased green time at traffic signals (particularly on uphill routes).
- conventional roundabouts often pose a high risk to active travel users, for people cycling due to the speed differential and difficulty in road positioning, and for people walking or wheeling as desire-line crossing points are often on entry/exit arms, which, depending on the geometry, may have high traffic speeds.
- multi-disciplinary design input – the best designs, particularly for complex transport problems are often identified through interactive sessions involving user groups, stakeholders and designers.

10.5.8 In some cases, it may not be feasible for a route to be brought up to an acceptable standard, in this case the next most suitable route options should be considered.

Existing routes

10.5.9 The Act requires that existing routes which already meet or exceed criteria must be mapped. These show the current network of routes suitable for making active travel journeys, and highlight gaps to help develop the network of future routes.

10.5.10 If a route is to be included on the ATNM as an existing route, it should be audited and scored using the audit tool (see appendix H), with the audit score and associated description documented for future reference. An initial desktop study of routes identified at the network planning stage can help to establish which routes are likely to meet existing standards and 'pass' the audit.

10.5.11 The desirable audit score is 80% or above, with a minimum score of 70% being required to pass, to confirm the route is suitable for active travel (and justified for inclusion on the map as an existing route).

Critical fail

10.5.12 A route that has any element that is marked as 'Critical' is not deemed suitable for active travel and cannot be included as an existing route. However if the route can be improved to address the 'Critical' element then it can be included as a future route on the ATNM.

10.5.13 Critical elements for walking and wheeling include if the route is missing drop kerbs, thus rendering the route inaccessible for some users. For cycling, critical elements include if more than 50% of the route includes cycle provision with widths which are more than 25% below desirable or if the route is on-carriageway and has higher than acceptable motor traffic flows and speeds.

10.5.14 A critical element is also included if there is an access control that restricts legitimate users (see section 15.3 for principles for access controls, if they are required).

Audit review

10.5.15 When reviewing the map, routes that have already passed are not necessarily required to be re-audited, though the previous audits should be reviewed against any changes to the design guidance or the route itself, to ensure the classification is still applicable.

10.5.16 Routes that have failed but are eligible to be passed with an accompanying statement (see section 10.6) should be reaudited to ensure the statement is still applicable. Where this is the case, the statement will need to be re-accepted by Welsh Government.

10.6 Existing routes – pass with statement

10.6.1 Where a route falls short of acceptable design standards, or where a route loses percentage points during the audit, because of a factor that cannot reasonably be modified, it may eligible to be included as an existing route with an accompanying statement – a 'Pass with Statement' route should have a score between 60% and 69%. This statement must be included on the mapping system when the ERM/INM (now known as ATNM) is submitted for approval by the Welsh Ministers.

10.6.2 Statements must contain sufficient detail about the shortfall of the route for an assessment to be made of its impact on the route's usability. For example, where a path is below the width recommended within this guidance, the statement must indicate the actual width and the length of the route affected by this. Where a shortfall is likely to be permanent in nature, for example a route passing through a narrow bridge opening, an explanation should be given why an alternative route is not being used. Mitigating factors may also be included in the statement, for example where an unlit path is only likely to be used during daylight hours, or where a narrow path will have only light usage. The information used in the statement will normally be derived from the audit process. Some examples are included below:

- this important primary route to the high school from the town centre is constrained by the narrow footways (1.0m wide for approx. 90m) and the speed of motor traffic in this area.
- this route is a key link between the retail park, residential areas, schools and the industrial estate area. The route can have relatively high motor traffic flows and lacks a suitable connection to the retail park at the southern end.
- this route is a key link between the rail and bus stations as well as a central connection between the town centre and the riverside path. There is no dedicated cycle crossing at New Road, limited signage and a lack of priority crossings for people cycling.

10.7 Future routes

10.7.1 Future routes to improve conditions for active travel can include both existing route upgrades and new-build alignments as well as modifications to the existing highway network and Public Rights of Way.

10.7.2 Future routes on the ATNM are intended to show plans for the development of the network over the next fifteen years. The routes shown on the map should be based on an analysis of where people are likely (or could be expected) to make active travel journeys.

10.7.3 Desktop studies may identify future route alignments that will not yet be able to be reasonably audited (for example, a proposed new river crossing), though where possible, it is a useful exercise to audit future route alignments to identify where improvements need to be made.

10.7.4 Where funding is being sought from Welsh Government for a new route or improvements, a current and potential audit score should be provided to accompany a funding application.

10.7.5 At this stage, the audits for future routes are primarily concerned with identifying the nature of the issue and likely feasibility or scale of works required to meet the active travel standards. Detailed design solutions do not need to be proposed.

10.7.6 Additional auditing tools could be used where appropriate to provide context and to take account of stakeholder views during scheme specific designs. There are several other methods for auditing infrastructure, ranging from detailed street audits, to surveys that only consider specific aspects of the infrastructure (such as footway condition surveys).

Presentation of routes

10.7.7 Routes agreed as part of the network development process to be included on the ATNM include the alignments of both existing and future routes, as outlined within the steps taken above. For future routes where exact alignments are yet to be decided, these can be illustrated as point to point desire lines. The map markings should illustrate the type of route in place or proposed (for example, whether a route is on a footpath away from a highway, or adjacent to a highway on a footway), and this will be achieved by selecting the appropriate attribute when inputting the route on the Welsh Government provided mapping system.

10.7.8 Related facilities (see chapter 14), both existing and planned future facilities (where known) should also be shown on the ATNM. Depending on the local context, this may include:

- cycle parking/storage/maintenance facilities.
- e-cycle or electric mobility aid charging facilities.
- public cycle: hire docking or hire facilities.
- public mobility: aid docking or hire facilities (such as shopmobility).
- public toilets and/or washing facilities.

10.7.9 Potential barriers or considerations that people walking, wheeling and cycling may need to be aware of, should be shown on the ATNM and could include:

- access barriers which prevent infrastructure being fully accessible (including steps without adjacent ramped provision).
- level crossings.
- one–way streets.
- places that are not accessible at all times (for example, gated at night).
- routes or sections that have no streetlights.
- routes or sections where widths are less than the minimum specified in the design guidance.
- roads where walking, wheeling or cycling is not permitted.
- steps and/or steep gradients (for example more than 1 in 12).

10.7.10 Other walking, wheeling and cycling routes, including Public Rights of Way, that do not meet the design standard (and cannot be modified) or whose purpose is primarily for leisure, may be shown on the ATNM for completeness but cannot be classed as active travel routes and should be differentiated in terms of how they are represented. On DataMapWales they are shown as 'Other' routes and can be useful for identifying additional walking, wheeling and cycling provision such as the Wales Coast Path or sections of the National Cycle Network.

10.7.11 Each route shown on the Map should have a route ID number and it is recommended that a simple identification system is used across the authority area for consistency. An example could include: Local Authority – Settlement – User Type – Number:

- Wrex-Llay-W (or C or SUP)-001.
- NPT-Neath-SUP-004.

10.7.12 Routes should connect key destinations or connect a key destination to a junction with another route on the active travel network and a title can be included alongside the Route ID. If a longer route is required it may need to be split along infrastructure or delivery options and a sufficient section reference should be included at the end:

- Wrex-Llay-W (or C or SUP)-001-A.
- Wrex-Llay-W (or C or SUP)-001-B.
- Wrex-Llay-W (or C or SUP)-001-C.

10.7.13 Each route section should start/end at a logical origin or destination point to ensure users are not left stranded with no safe onward route.

10.7.14 Short sections of route should be avoided where possible. For example using separate route numbers for different sections of infrastructure between key destinations is not recommended. It is preferable to use the same route ID to be used for the entire route as this demonstrates coherence and continuity, two key features of route planning.

10.8 Routes on land not owned by a local authority

10.8.1 The agreement of landowners to showing active travel routes on the ATNM is not required where the route is an existing right of way, and of the appropriate classification for the use specified in the map (accessible to walkers if shown as a footpath). However, efforts should be made to bring the ATNM to the landowner's attention.

10.8.2 If the route is a permissive route, then the landowner's agreement must be sought. In many cases a note to confirm agreement will be sufficient. This should be undertaken during the compilation of the map, before the public consultation on the Map begins. If there are time restrictions on when a permissive route can be used this should be noted on the map.

10.8.3 Consent is not required to show possible future routes on the ATNMs, but reasonable effort should be made to notify and consult with landowners wherever possible. Depicting a route on a map does not negate the need to follow due process for route enhancements and creation (such as traffic regulation orders or path creation orders) and landowners who are unwilling to have these plans enacted on their land will have opportunities to object at the appropriate stages.

10.9 Validation of Active Travel Network Maps

10.9.1 Once the draft ATNMs have been produced, before submission to Welsh Ministers, they must be validated through a statutory consultation process that must last at least 12 weeks and should be as extensive as possible to help ensure all those who may be affected by the proposals have a chance to input. General advice on consultation techniques and parameters is included in chapter 5.

10.9.2 Prior to this statutory consultation period a local authority may want to carry out interim engagement with internal and external stakeholders to shape the proposals.

10.9.3 It is important to be clear in any statutory public consultation that the ATNMs show longer term aims and outline ideas. Engagement on the maps does not replace the need for formal consultation and negotiation on individual schemes as and when specific proposals for delivery/implementation are taken forward.

10.10 Submitting the Active Travel Network Map

10.10.1 Following the statutory consultation, any required amendments should be made to the ATNMs (for both walking and wheeling, and cycling improvements) prior to submission to the Welsh Ministers for approval. Chapter 4 provides details of the factors Welsh Ministers will be considering for approval of the map(s).

10.10.2 Welsh Government's active travel mapping system on DataMapWales provides the functionality for maps to be submitted automatically. Detailed instructions will be provided to Authorities at the time when ATNMs are due for submission.

10.11 Publishing the map

10.11.1 The Act requires that local authorities publish the map, and any statement and explanation of routes that do not meet the design standard. Key requirements for publishing the map are provided within chapter 4. Local authorities are encouraged to bring the map to the attention of the local population in an appropriate way for their area.

10.11.2 DataMapWales includes functionality for public viewing of the ATNM. Consideration should be given to whether the technical nature of this resource is the most appropriate method for publishing active travel route information for all public audiences. Holding the map digitally allows local authorities to share information which is up to date and to provide features such as layered maps for different kinds of uses.

10.11.3 However, even in areas with high rates of internet use, there are still many people who cannot or choose not to use the internet. Local authorities are encouraged to publish maps of local walking, wheeling and cycling routes in their communities to help encourage more people to use these modes, both online and as hard copies and so they should therefore be available on request as a minimum. An example of a published map is provided in appendix C.

10.11.4 The map may also be used to inform other projects such as personalised travel planning and the development of applications and websites. The map and underpinning data, where possible, should be made freely available to bodies undertaking this work to enable them to improve their provision of information. Consideration should be given to the technical complexity of the ATNM in its original format on Welsh Government's mapping system, and that local authorities may wish to simplify when making the maps available for specific public facing purposes.

10.11.5 Local authorities could also consider specific formats for specific purposes, for example, to aid a large employer's work-based travel planning, or to promote a new section of route. Local authorities might want to use the information in the ATNM to create maps for people walking, wheeling or cycling separately.

10.11.6 Local authorities may wish to explore advertising opportunities, such as sponsorship, when publishing their maps. This may help further promote active travel and could help offset some of the publication costs.

10.12 Partial review of the map

10.12.1 Chapter 4 describes the option for local authorities to review their map within the review period, this section outlines the process required for this to take place.

10.12.2 Local authorities should ensure that all the organisations involved in the last full consultation process and all the individuals who have requested that they be consulted about the map are informed of the intention to conduct a partial review, and that they are provided with an opportunity to comment. Local authorities should also ensure that any ongoing engagement mechanisms they have in place are made aware of the intention (see chapter 5) to conduct a partial review, so that all stakeholders have the opportunity to be involved.

10.12.3 At least one accessible public consultation event must be held in each of the settlements affected by the revision.

10.12.4 The consultation process should run for a minimum of 12 weeks.

10.12.5 Submitting a partial review will not affect the timetable for submitting the authority's full review of the map.

10.13 Prioritising the active travel routes

10.13.1 Local authorities should have a clear plan for the delivery of their active travel upgrades over a fifteen year period. The parts of the network that potentially offer the greatest impact on increasing rates of active travel should be prioritised, but other local priorities may also be considered such as targeting areas of deprivation or poor public health and these priorities should be established by setting network aims. Local authorities should also be mindful of their duty to contribute to the achievement of the goals of the Well-being of Future Generations Act as well as their relevant regional transport delivery plan.

10.13.2 A data led approach should be used for prioritisation analysis and decision making about which routes are most important to achieving the network aims or offer the best value for money. The validation stage may also prove a useful source for assistance in deciding priorities.

10.13.3 Where several small schemes have been identified within the same area, or on the same route, it may be appropriate to merge the schemes into a package of works, to help ensure that individual measures are implemented together and achieve complementary benefits and synergies.

10.13.4 The advantage of using a prioritisation framework is that it brings some consistency to the assessment of schemes across a local authority area. A methodical scoring system also ensures that consideration is given to important aspects such as the impact of schemes for increasing active travel so that deliverability does not take precedence as the main factor determining prioritisation. Local authorities should consider how they make the public aware of the prioritisation to raise awareness on why certain routes are being developed before others.

10.13.5 Some local authorities may have existing prioritisation tools in place for aiding the decision making process regarding infrastructure projects, including specific active travel tools. A scoring matrix to assist prioritisation of schemes identified in the ATNM, together with the associated scoring criteria, is included at appendix K.

10.13.6 Transport for Wales have developed a GIS-based prioritisation tool based upon the principles outlined in appendix K which is also available for use by local authorities.

10.13.7 Factors such as the level of available funding and the opportunities for ‘quick wins’ that demonstrate progress are also important in considering which schemes to take forward. Whilst larger and more complex routes may have a long lead in due to the complexity of planning and design required, where they are prioritised these proposals should be designed and developed in parallel with the delivery of less complex routes.

10.13.8 One of the advantages of the prioritised ATNM is the ability to deliver the network through a broader range of funding sources and not just through budgets specific to active travel. This includes opportunities to gain new routes and improvements through planning gain, developer contributions or associated conditions, but this will introduce dependencies on the timeline of the development to deliver network elements. It may also allow ways for more ambitious long-term schemes to be planned and delivered as part of major highway or redevelopment schemes.

10.13.9 There are a number of modelling tools that use transport and demographic data to help to indicate potential impact. For future ATNMs, this data could be used to inform the network planning stages outlined above. With better monitoring of actual scheme costs and usage, these tools will become more refined in the future. This information, along with the additional factors that are set out in table 10.1 below, can also be used to inform the decision making process.

Table 10.1: Additional factors that could be considered during scheme prioritisation

Criterion	Method	Source of data
Access to jobs	Higher priority for routes that serve areas of high employment density.	Census – Workplace population.
Air quality	Higher priority for routes that offer mode choice in areas of poor air quality.	Air quality management area or local air quality monitoring stations.
Congestion	Higher priority for routes that offer mode choice in areas of high congestion.	Traffic flow data or local transport model.
Deliverability	Higher priority for routes that are most deliverable, for example availability of funding or complementary schemes.	Local authority knowledge.
Deprivation	Higher priority for routes that serve areas of multiple or specific indices of deprivation (note: local authority should be mindful that multiple indices potentially double-count other criteria in this table).	Indices of multiple deprivation or specific sub-domains.
Growth	Higher priority for routes that connect to sites earmarked for development.	Local plan, etc.
Local safety	Higher priority for routes in areas with a high rate of cycle collisions per person cycling or per km – cycled. Cycle collision needs to also consider pedestrian collision data.	Stats 19 collision data; Department for Transport or local traffic counts.
Pinchpoint/ severance	Higher priority for routes that overcome significant barriers in the network, such as waterways, railways or major highways.	Local authority knowledge.
Propensity to cycle	Higher priority for routes in areas where propensity for short trips is highest (number of short, cycleable trips as a ratio of all trips).	Propensity to cycle tool, Census – Journey to Work or local transport model.
Public health	Higher priority for routes that serve areas with high rates of inactivity-related health complications, such as obesity, diabetes.	Locally available public health data, such as obesity rates.
Transport inequality	Higher priority for routes that serve communities with low car ownership and/ or low accessibility to public transport.	Census – household car ownership; public transport accessibility.



Chapter 11: Designing for active travel routes and links

This chapter provides guidance on the design of active travel routes for walking, wheeling and cycling. Section 2(6) of the **Active Travel Act** requires local authorities to have regard to this guidance when determining whether a route is suitable to be designated as an active travel route.

Key areas for consideration include:

- status of the design elements.
- design considerations, such as separating surfaces for people cycling and people walking and wheeling.
- suitability of provision depending on motor traffic speeds and flows (**table 11.1**).

11.1 Introduction

11.1.1 This chapter provides advice on design of active travel routes and links, which meet the needs of people walking, wheeling and cycling, in urban and rural situations. A link can be the section of route between junctions and crossings, or a dedicated link onto an active travel route.

11.1.2 It builds on guidance on the user needs (chapter 9) and network planning for walking and cycling (chapter 10). It should be read in conjunction with guidance on placemaking in chapter 8 and chapter 14, which covers direction signing, cycle parking and features of value to people walking and wheeling, such as benches; as well as chapter 15 on construction, maintenance and management, which includes details on drainage, fencing, tactile paving, lighting and access controls.

11.1.3 Appendix G provides more detailed design guidance on specific measures combining advice on key design features with other considerations, alongside a drawing example for each of a series of Design Elements. Where the text refers to a Design Element in appendix G it is noted with a reference, for example DE205.

11.1.4 The Design Elements should be regarded as “standards” for the purposes of section 3(6)(a) of the Active Travel Act. When modifying existing local highways and other Public Rights of Way it may not always be possible to meet the desirable dimensions set out in this guidance, and the constraints that lead to this difference should be logged in a Design Decision Log (see appendix L). As stated in chapter 7, authorities should provide justification to Welsh Government where a scheme included in an ATNM cannot meet the desired standard due to localised constraints. Any design decision or departures on ERM/INM (now known as ATNM) schemes should also be logged in the Design Decision Log in appendix L which should accompany the ATNM (see chapter 10), but departures in Strategic Road Network (SRN) environment should follow appropriate departure process (see section 7.5).

Local authorities should contact the Active Travel team at Welsh Government if they need further advice on an individual scheme.

11.1.5 The terms 'absolute minimum' (or "maximum") and 'desirable minimum' (or "maximum") are used throughout the details. Desirable values are the minimum level for best practice provision which should be provided whenever possible. Absolute values should only be used if there are no viable alternatives and only for short sections (for example a small section being narrowed at a bridge, tree or building). However, designers should keep in mind the importance of continuity; meaning it may be acceptable in exceptional circumstances to provide a small portion of route that is sub-standard in order to provide a continuous route. In all cases, the designer should keep an audit trail of decisions made to justify why the best practice level of provision cannot be provided, please refer to appendix L. Any project team considering infrastructure outside absolute values should seek a discussion with Welsh Government and TfW Active Travel Hub before it is proposed.

11.2 General design considerations

11.2.1 Important design factors for routes and link sections include:

- design context and relative importance of movement and place functions (see chapter 8).
- physical dimensions of the highway, including available widths and gradients.
- connections with adjacent routes.
- be inclusive to meet the needs of all users (see chapter 9).
- forming a coherent and continuous network (see chapter 10).
- expected future growth of pedestrian and cycle traffic.
- the type of route: primary, secondary or local (see glossary).
- motor traffic speeds, volumes and proportion of HGVs.
- kerbside activity, such as parking, loading and bus stops.
- utilities, location and requirements.
- construction, maintenance and enforcement requirements (see chapter 15);
- scheme cost and available budget.

11.2.2 Active travel routes may be delivered by:

- providing separated infrastructure along busy roads.
- following low speed and traffic volume roads or motor traffic-free paths (whilst still being as direct as possible).
- using measures to reduce motor traffic speeds and volumes and the maximum size of vehicles where routes are also open to motor traffic.
- reallocating space from motor traffic lanes or car parking to use for people walking, wheeling and cycling.

11.2.3 Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

11.2.4 When planning an active travel route all efforts should be made so it can be used by everyone. The route should not exclude users either by lack of accessibility (for visually impaired users, wheelchairs and mobility scooters, prams, cargo cycles users, for example) or by lack of inclusion (neurodivergence, dementia, perceived safety and fear of harassment, which is especially problematic for women and girls and other users that might feel vulnerable). It is important to note that users will experience places differently and spaces should cater for all users equally at all times of the day (see user needs in chapter 9). When planning a route that might exclude some potential users (for example a route that has low passive surveillance and for that reason might not be used by women, girls and other people that might feel vulnerable), there should be an alternative route already in place that these users can use instead.

11.2.5 Road Safety Audits (RSAs) provide an effective, independent review of the road safety implications of engineering interventions for all road users. It is recommended that Stage 1 – 4 RSAs are undertaken on all active travel schemes by professionals with experience in active travel. RSAs shall be undertaken in line with GG 119 on all schemes that make changes to the layout on trunk roads and motorways.

11.3 Link design considerations

11.3.1 A link is defined as a section of route between junctions or a stand alone section of route connecting to another active travel route. Link design should be considered alongside junction design, which is covered in chapter 12, and the five design principles should be followed.

Direct

11.3.2 People walking, wheeling and cycling prefer to follow natural desire lines which avoid deviations. Where walking and wheeling routes are indirect many users will take the shortest available desire line, away from the formal footway or footpath. Routes for people cycling should be as least as direct as those for motor traffic.

11.3.3 Directness in terms of time is important. Having to slow down or stop imposes a substantial time penalty and wasted effort. Cycling routes should be of adequate width for the expected flows to enable overtaking amongst people cycling.

Safe

11.3.4 Entry and exit points to active travel links should be carefully considered. Access should be provided at the start and end of the route as well as to side roads and trip attractors such as stations, cycle parking and retail that the route passes. Appropriate access for all users should be provided, including for adapted bikes, wheelchairs and mobility scooters. Hazards and potential conflicts present at the entry and exit points should also be appropriately highlighted.

11.3.5 To minimise risk of collisions and injury to people walking, wheeling and cycling attention should be given to:

- providing sufficient width so that people walking and wheeling are not required to move into the paths of motor vehicles or people cycling due to crowding, taking account of street furniture position or clutter that might reduce the effective width, such as signage, benches and bins.
- providing adequate geometry, visibility and space for people cycling, allowing for user errors and evasive manoeuvres.
- separating surfaces for people cycling and people walking and wheeling.
- reducing the volumes and/or speeds of motor traffic to a level which allows people of all ages and abilities to cycle in comfort and safety – or, where this cannot be achieved physically separating people cycling from motorised traffic.
- ensuring that the design of any infrastructure for people cycling reflects how people cycling are trained through National Standards Cycle Training.

Comfortable

11.3.6 In addition to the principles above, comfortable walking, wheeling and cycling routes will help to attract new users and this can be achieved by:

- minimising gradients and keeping slopes as short as possible.
- providing good lighting, smooth and well-maintained surfaces (including regular clearance of vegetation and debris).
- avoiding placing obstructions in a route; removing existing ones.
- providing adequate width for the volume of people walking, wheeling and cycling.

- minimising effort by avoiding people cycling having to slow down or stop on links.
- minimising nuisance from motor traffic, through reduced speeds and greater separation.
- minimising conflict between people walking and wheeling and people cycling.

Attractive

11.3.7 People walking, wheeling and cycling are much more exposed to their environment than people in motor vehicles, so are more sensitive to the quality of experience when using a route (see chapter 8). Routes should:

- look attractive and be interesting.
- integrate with and complement their surroundings.
- contribute to good urban design.
- feel secure, be well overlooked and lit.
- be well maintained.

Coherent

11.3.8 To build coherent networks, people walking, wheeling and cycling should be provided with:

- routes that seamlessly connect to all the places people walking, wheeling and cycling want to start and finish their journeys.
- high quality and appropriately placed signage, that is consistent and easy to navigate for all.
- connections that overcome or reduce severance wherever possible, for example routes across busy roads, railway lines or watercourses.

11.4 Cycling routes and links

11.4.1 Table 11.1 shows what conditions most people will find acceptable for cycling and what conditions can exclude people. The existing amount of motor traffic and 85th percentile speed offer a starting point to consider whether to separate people cycling from motor traffic, or to reduce motor traffic speed and volume, to a level that is acceptable to most people. Streets that already have low motor traffic speeds and volumes help to make up the basic network. The basic network, also referred to as local network, refers to all local quiet streets where low speeds and volumes of motor traffic make them suitable for walking, wheeling and cycling, without need for designated cycling infrastructure.

The table categorises provisions in colours red, amber, green or grey:

- Green = Provision suitable for most people.
- Amber = Provision not suitable for all people and will exclude some potential users and/or have safety concerns.
- Red = Provision suitable for few people and will exclude most potential users and have safety concerns.
- Grey = Provision only suitable for a few. Critical fail in cycling route audit – see chapter 10 and appendix H.

Table 11.1: Cycle provision on links

85th percentile speed[2 3]	Total motor traffic (AADT)[1]	Fully kerbed separated cycle track	Stepped separated cycle track	Light separation	Cycle lane (mandatory/ advisory)	Cycling mixed with motorised traffic
Up to 22mph	Less than 2500	Suitable for most	Suitable for most	Suitable for most	Suitable for most	Suitable for most
Up to 22mph	2500 to 4000	Suitable for most	Suitable for most	Suitable for most	Suitable for most	Not suitable for all
Up to 22mph	4000 to 5000	Suitable for most	Suitable for most	Suitable for most	Suitable for most	Only suitable for a few
Up to 22mph	5000+	Suitable for most	Suitable for most	Suitable for most	Only suitable for a few	Only suitable for a few
Between 22mph and 33mph	Less than 500	Suitable for most	Suitable for most	Suitable for most	Not suitable for all	Not suitable for all
Between 22mph and 33mph	500 to 4500	Suitable for most	Suitable for most	Suitable for most	Not suitable for all	Only suitable for a few
Between 22mph and 33mph	4500+	Suitable for most	Suitable for most	Suitable for most	Only suitable for a few	Only suitable for a few
Between 33mph and 44mph	Any	Suitable for most	Not suitable for all	Not suitable for all	Only suitable for a few	Only suitable for a few
Over 44mph	Any	Suitable for most	Only suitable for a few	Only suitable for a few	Critical fail	Critical fail

Notes:

1. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow.

2. In rural areas, when walking and wheeling routes are shared with motorised vehicles, 85th percentile speeds of 22mph and motor vehicle totals of up to 1000 AADT (annual Average Daily Traffic) are desirable. This corresponds to circa 100 vehicles an hour. Shared routes with speeds of up to 33mph may be acceptable in exceptional circumstances (where motor vehicle totals are much lower).

3. For new developments where 85th percentile speed data is unavailable, the design speed limit should be used, and traffic calming measures may need to be implemented to ensure compliance.

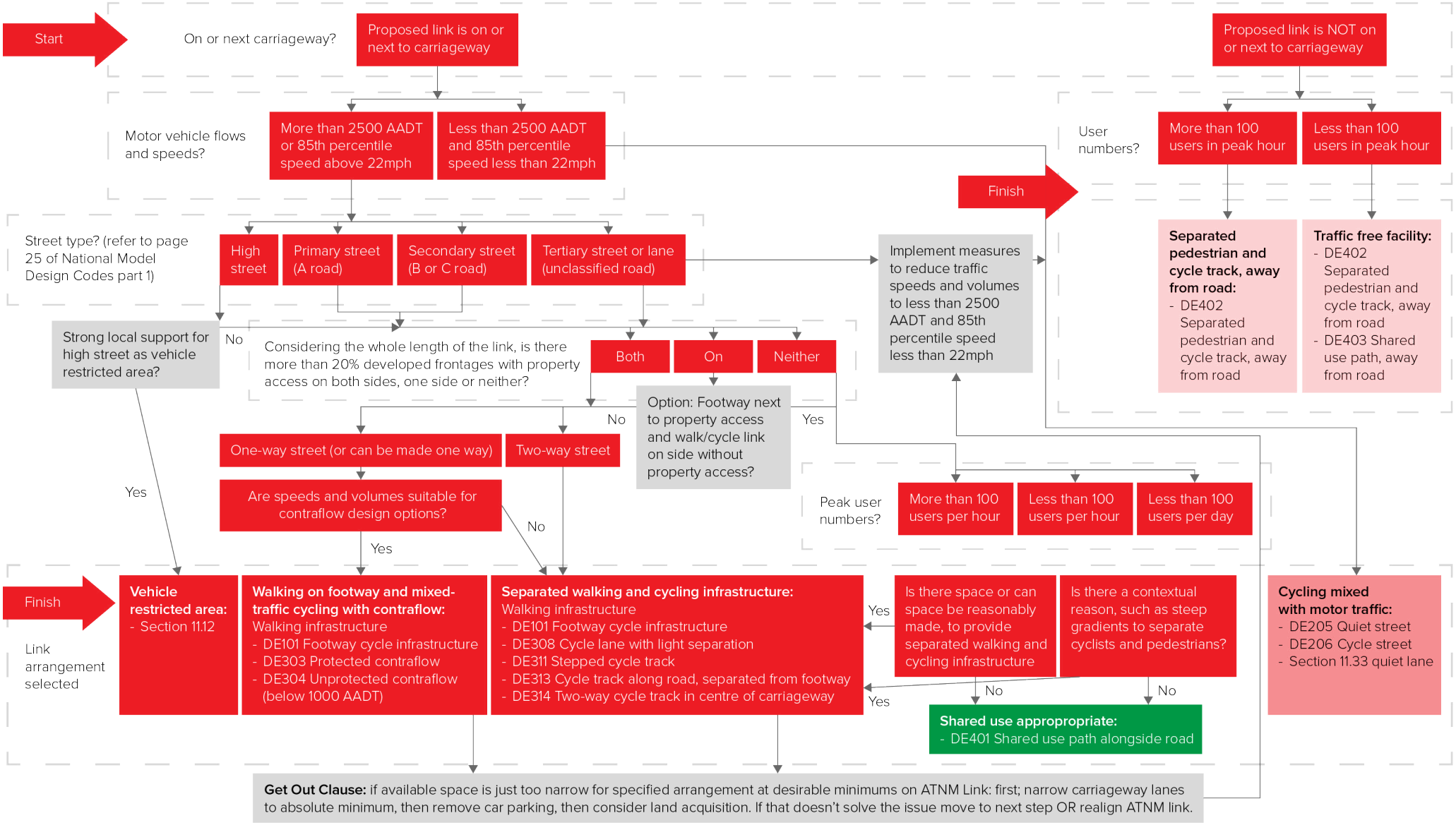
11.4.2 Separation from motor traffic may be done by:

- light separation – intermittent physical separation from motor vehicles (such as use of refuges, planters, bollards, or other features).
- continuous physical separation that can be crossed by people cycling (such as a stepped track).
- continuous physical separation that can only be crossed at designated locations (such as full height kerb, verge).

11.4.3 Based on the table above, the present guidance and additional guidance documents mentioned, the ATNM link design selector in figure 11.1 was created, to support the decision making, planning and design of cycling routes. Its function is to support local authorities and other professionals, when deciding on the best type of infrastructure for their local routes. It is intended to provide a guide to selecting the most appropriate route design or link type with reference to the Design Elements, at the kilometre scale, to provide the most continuous and coherent route achievable. This helps support coherence. It is recognised that this may require some variety of design arrangements to accommodate real-world features; for example crossings, junctions and pinch-points. Using this table requires knowledge of existing and forecast user numbers and traffic conditions, but also shows what conditions are suitable for each type of design, with section 11.6 supporting on how to achieve these conditions. The ATNM Link Design Selector is a guide, and needs to be applied along with professional judgement and the Design Decision Log.

11.4.4 Appendix M, offers support on how to use the ATNM Link Selector, explaining all possible routes (more accessible for screen readers) and also shows how to estimate the percentage of the route with developed frontages.

Figure 11.1: ATNM Link Design Selector



11.4.5 In practice, a cycle route from one place to another will often involve sections of different types of provision: shared roads, cycle lanes, cycle tracks alongside the carriageway and cycle tracks away from the road. This may be due to being unable to meet the minimum standards within the guidance over a particular short section of the route. However, this should not compromise the overall standard of the whole route. A safe and convenient transition between different forms of provision is critical to ensure route coherence.

Coloured surfaces

11.4.6 Coloured surfaces are not prescribed by TSRGD and have no legal meaning. There is no obligation to use them and they should be used sparingly to minimise maintenance costs.

11.4.7 Locations where properly maintained coloured surfacing may be appropriate for safety reasons are:

- advanced stop line reservoirs and their feeder lanes (DE614).
- cycle lanes across the mouth of junctions (DE306).
- routes through complex junctions (DE616-620).
- cycle lanes alongside on-street car parking (in addition to the buffer strip – DE305).
- cycle continuation at bus stops (DE501-505)
- any other areas of potential conflict.

11.4.8 Colour choice is a matter for the local highway authority, but a single colour should be used within a highway authority for consistency and to simplify maintenance. Green, red or blue surfaces are most commonly used.

Tactile paving

11.4.9 Tactile paving is provided on both links and at junctions and crossings to assist visually impaired people in moving around an area. The use of tactile paving should be considered at the design stage to ensure it is fully integrated. For guidance on applying tactile paving, see "Guidance on the Use of Tactile Paving Surfaces".

11.4.10 Common types of tactile paving and their uses are described in chapter 15, as well as being shown in context on the design element diagrams.

11.5 Co-creation

11.5.1 Stakeholder participation through consultation and engagement in planning and design is fundamental to the process of developing an active travel strategy and network plan (see chapter 5). In many cases, a deeper level of engagement, which is guided by the local community, can improve scheme design and acceptability. This is often referred to as 'co-production' or 'co-creation'.

11.5.2 In a community-led initiative resident groups contribute detailed knowledge of local issues (often assisted by engagement specialists) to work with the highway authority and other partners to create local infrastructure improvements for active travel.

11.5.3 Co-creation can be applied to any street to help residents, businesses and other stakeholders directly to address the local issues and opportunities to improve their street or neighbourhood. The aim is to create streets that can become spaces for a wider variety of community activity, using pedestrian crossings, benches, planting and other features to restore the balance between movement and place. This can help make streets into safer and more attractive places to live, work or visit.

11.5.4 Chapter 5 recommends that co-creation should mainly be applied to the development of significant schemes. For example, for bigger developments or across an existing neighbourhood, engagement is best carried out at several stages throughout the project. For minor works, for example provision of a drop kerb crossing, statutory processes will be sufficient, but stakeholders may be approached for their local knowledge.

Figure 11.2: Co-creation process being undertaken as part of a scheme



11.5.5 Home Zones are residential streets in which the design speed is set very low, at less than 20mph and maximum motor traffic flows of 100 vehicles per hour are the norm. Often, the whole highway is shared between all road users, although it can include pedestrian only spaces for vulnerable users. Co-creation of the space is key to making a scheme of this nature to work and to change the behaviour of residents and other street users. See section 11.8 for other area wide schemes where engagement and co-creation are also key.

11.5.6 Home Zones are legally designated under the Transport Act 2000. Designers should follow the principles set out in the Manual for Streets and Manual for Streets 2.

11.5.7 DIY streets (from Do It Yourself) is a concept developed by Walk Wheel Cycle Trust which encourages communities to generate ideas for improvement of their street. They use a similar approach to home zones, but involve smaller interventions at a lower cost (for example artworks in the carriageway, plants or trees, acting as traffic calming).

11.6 Reducing the speed and volume of motor vehicles DE201, DE202, DE203 and DE204

11.6.1 Where motor traffic volumes and speeds exceed the values for a mixed traffic link (table 11.1), consideration should be given to reducing motor traffic flows and speeds so that cycling can be accommodated on the carriageway. Table 11.2 provides a list of techniques that can be used to create suitable mixed traffic routes and links and assist in creating a basic network, mainly for people cycling but which also enhance the environment for people walking and wheeling.

11.6.2 People walking, wheeling and cycling will usually benefit in terms of safety, comfort and attractiveness from a reduction in the speed and volume of motor traffic along links and at junctions. The range of measures used to achieve this to help create the basic network described previously in section 10.4.

11.6.3 On road cycling benefits from the default 20mph speed limit which brings wider opportunity for network design. Further information on 20mph can be found in Introducing default 20mph Speed Limits.

Table 11.2: Creating the basic cycle network by managing motor traffic speed and volume

Measure	Description
On-carriageway	Advisory cycle lanes and removal of centre lines as an aid to speed reduction. Signed routes on quieter roads and streets. Modifications to junctions such as advanced stop lines, or altered priority for the cycle route.
Filtered permeability	This technique involves the 'filtering out' of motor vehicles (sometimes of only private traffic, with bus access retained) from parts of a network. Walking, wheeling and cycling permeability, through providing a choice of routes through a network, is retained. If access for motor vehicles in one direction only is removed, cycling should be permitted in both directions (contraflow cycling) (DE303 and DE304).
Physical traffic calming	A range of options exist for reducing traffic speeds through physical measures, such as road humps and carriageway narrowing. Any traffic calming devices should be designed to be safe and comfortable for people cycling.
Changes and road geometry and layout	Manual for Streets provides guidance on how road geometry and layout can be used to reduce motor traffic speeds such as reducing carriageway width, reducing forward visibility and using sharp changes in direction. Reallocating carriageway width to widen footways and/or to enable dedicated space for people cycling will tend to reduce speeds and provide additional safety and comfort for active travel. Quiet Streets (DE205) and Cycle Streets (DE206) involve the introduction of features to the carriageway layout which show that the route is intended to be used as an important cycle route.

Measure	Description
Healthy neighbourhoods (LTNs)	Healthy neighbourhoods are an area wide approach to reduce speed and volume of motor traffic, which act as a catalyst for designing an alternative use of street space. The Healthy Streets Tool assists in assessments that prioritise user experience.
Home zones and DIY streets	Home zones comprise residential streets in which the whole of the road space is shared between all road users, although it will often include a pedestrian-only space for vulnerable users. Design speed is set very low, at less than 20mph. Home zones enhance streets so that they are not just traffic routes but spaces for community activity. DIY streets use a similar approach but in a low-cost way, with the design and implementation of the scheme being led by the local community.
Quiet lanes	Quiet lanes are the rural equivalent of home zones. These are aimed at making country lanes more attractive for walking, wheeling, cycling and horse riding.

11.6.4 People cycling may be exempted from access restrictions applied to motor traffic on links or at junctions where safe to do so, or through the creation of short connections which are only available to people walking, wheeling and cycling, to give them time and distance advantages. DE204 shows how a cycle-only access can be provided which includes a central lane to assist people cycling as they turn right, while an advisory contraflow is illustrated in figure 11.3.

Figure 11.3: Contraflow cycle lane, Penarth



11.7 Speed reduction – traffic calming DE201, DE202 and DE203

11.7.1 Traffic calming measures reduce motor vehicle speeds, thereby improving safety for people walking, wheeling and cycling, and residents living along traffic calmed routes. Designs should take particular account of feedback from the emergency services and bus operators.

Figure 11.4: Example of a raised table with tactile crossing point in Cardigan, Ceredigion



11.7.2 Poorly designed vertical features, such as speed humps and tables, can be uncomfortable for people cycling or using the bus and horizontal deflections, such as build-outs, chicanes and pinch points can feel hazardous if vehicles attempt to overtake.

11.7.3 Sinusoidal humps are more comfortable for people cycling (see DE202) for details and cycle bypasses should ideally be provided at pinch points (see DE203).

11.7.4 Changes in basic road geometry and appearance, such as using narrower carriageways, removing centre line markings, reducing forward visibility, sharp changes in direction or changes in priority at junctions can all contribute to speed reduction.

11.7.5 Footways can become very constrained on waste collection days, which can make navigating very difficult especially for wheelchair or people with visual impairments. Small improvements such as a marked space for bins can sometimes help containing the bins so they are not left scattered on the footway.

Figure 11.5: Marked area for bins, Cardiff



Figure 11.6: Marked area for bins, Cardiff



11.8 Filtered permeability

11.8.1 Filtered permeability uses traffic management techniques to reduce the volume of motor traffic and can give active travel modes an advantage through exemptions to the restrictions applied to motor traffic. This simple technique can significantly reduce through-traffic to make areas safer and more pleasant for walking, wheeling and cycling without major infrastructure investments.

On routes where 85th percentile speeds are less than 22mph, but motor traffic volumes are above 2500AADT, filtered permeability can be a cost effective way of reducing traffic volumes to make the route suitable for on road cycling. This can be a lower cost way of expanding the cycle network, especially considering the default 20mph speed limit now in place.

11.8.2 Area wide engagement is key for the success of these measures and extensive filtering schemes such as in Waltham Forest have seen significant changes in travel behaviour and improvements in air quality.

11.8.3 Filtered permeability uses Traffic Regulation Orders (TROs), typically:

- road closures for motor traffic.
- point closures at one end of a street.
- banned turns.
- one-way streets.

11.8.4 There should be a presumption to exempt people cycling from any such TROs, unless there are overriding safety reasons for not doing so, which could include an unacceptable impact on people walking and wheeling. Residents and businesses are usually concerned about the impacts of restricted access or displaced traffic and should be consulted at all stages of the development. Experimental or temporary TROs and removable features can be used so that schemes can be trialled and monitored prior to construction, thereby helping to address local concerns while allowing sufficient time for people to adjust to the new infrastructure, and for schemes to be modified.

11.8.5 Figure 11.7 shows how access to a side street has been provided for cycles only, similar to that shown on DE204 and this type of facility is often known as a modal filter.

Figure 11.7: Modal filter allowing walking, wheeling and cycling access through an area restricted to motor vehicles, Swansea



11.8.6 It is important when designing modal filters that access for people walking, wheeling and cycling is maintained and improved. Gaps for clear spacing between features of at least 1500mm should be provided to enable all types of cycle and mobility aids to use them. Pedestrian routes and footways should also provide clear, easy to navigate routes and where possible the opportunity should be taken to provide an at grade crossing point. The transition from any adjoining cycle networks should be seamless with no sharp corners and free of any kerb upstands.

11.8.7 Further information on applying these principles at a neighbourhood scale is available from Living Streets.

11.9 Quiet streets DE205

11.9.1 Urban cycling routes on streets with 85th percentile speeds less than 22pmh and motor traffic volumes less than 2500AADT are generally suitable for new and less confident cyclists (see table 11.1). Routes should maintain continuity for cycling and tackle barriers such as junctions and crossings at main roads that provide access to otherwise quiet streets.

11.9.2 With the introduction of the default 20mph speed limit, many streets with low motor traffic volumes are likely to be suitable for on road cycling and therefore may be suitable for inclusion on the approved Active Travel Network Map. Note that vehicles may not keep to the speed limit, so if measured 85th percentile speeds are above 22mph, speed reduction measures should be introduced to make the route sufficiently safe and inclusive for on road cycling.

11.9.3 TSRGD cycle symbols to diagram 1057 can be used to sign cycle routes and recommend the positioning for cycling within the carriageway.

Figure 11.8: Cycling on a quiet street



11.10 Cycle streets DE206

11.10.1 A cycle street is a quiet street which also serves as a primary cycle route. To succeed it should carry low volumes of motor traffic (under 2,500 AADT), have 85th percentile speeds below 22mph (see table 11.1), and high volumes of cycling that significantly exceed motor traffic levels, to provide people cycling with a level of comfort comparable to that provided by a motor traffic free route.

With the introduction of the default 20mph speed limit many streets with low motor traffic volumes are likely to now be suitable for on road cycling and could be used as cycle streets. Note that vehicles may not keep to the speed limit, so if measured 85thpercentile speeds are above 22mph, speed reduction measures should be introduced to make the route safe for on road cycling.

11.10.2 The objectives of a cycle street are to:

- Present a legible design recognisable to all types of user as a main cycle route.
- influence behaviour so that people cycling assume priority with drivers of motor vehicles behaving as ‘guests’, travelling at low speeds.
- maintain priority for people cycling, so that people driving do not overtake them until they leave the cycle street.
- be attractive to both experienced and less confident people cycling.

11.10.3 Cycle streets are not recognised within TSRGD but the Department for Transport previously indicated that cycle streets could be subject to:

- a ban on motor vehicles overtaking people cycling.
- an advisory speed limit of 15mph.

11.10.4 Signs and orders to support these restrictions would therefore require special authorisation from Welsh Ministers and authorities should seek advice from Welsh Government.

Figure 11.9: Cycle street, Cardiff



11.11 Pedestrian prioritised and informal streets

11.11.1 These streets reduce the dominance of motor vehicles with design features that enhance the status of people walking, wheeling and cycling. The designs usually involve significant improvements to the public realm such as high-quality surface materials, street trees, planting and seating.

Figure 11.10: Informal street with heavy pedestrian footfall



11.11.2 Pedestrian Prioritised Streets are areas with very low volumes of motor traffic where the whole street surface is for people walking and wheeling. Informal streets have higher volumes, and have designated spaces for walking, wheeling and cycling as well as defined pedestrian crossing points.

11.11.3 A level surface is a form of shared space, where the street is not physically divided by kerbs or a level difference indicating areas for particular modes. These streets need careful design if they are to work for all users.

11.11.4 Blind and partially sighted people may find shared space difficult to use and may avoid such areas due to fear of road danger and difficulty in navigating through the space. Such issues apply mainly within town centres and high streets that blind people visit rather than within lightly trafficked residential access streets.

11.11.5 Guidance paving (see Guidance on the Use of Tactile Paving Surfaces) can help to provide a distinct, detectable route for blind and partially sighted people to follow along the sides of a shared space and does not prevent other people from sharing the central part of the space (see section 15.2). Currently the only confirmed demarcation fully detectable to most blind people and recognised by guide dogs is a footway raised above the carriageway with at least 60mm kerb upstand. Colour, texture and tonal contrast between the carriageway and the footway areas will also help.

11.12 Vehicle restricted areas

11.12.1 Commonly used in the centre of towns and cities, Vehicle Restricted Areas (VRAs) are places where motor vehicles are restricted for some or all of the time, often referred to as 'pedestrianised' streets. The main purpose of VRAs is to provide an environment where pedestrians can move around freely without fear and intimidation from vehicles. They are marked by entrance signs which denote either 'Pedestrian Zone' or 'Pedestrian and Cycle Zone' as appropriate as shown in figure 11.11. VRAs are not be confused with Home Zones. Home Zones are where existing residential streets are made safer for people walking, wheeling and cycling by reallocating road space for children's play, larger gardens and cycle parking.

11.12.2 VRAs will usually be included in active travel route networks, either only for walking and wheeling, or for walking, wheeling and cycling. Because most VRAs are in town centres, they usually serve important destinations and provide one or more direct routes between different parts of the town or city.

11.12.3 VRAs may have a level surface to enable people walking and wheeling to use the whole of the street, which is particularly beneficial to people using wheelchairs and mobility scooters. Some vehicular access is usually necessary at certain times, typically for servicing and sometimes for access to car parking spaces for disabled people, or for taxis and/or private vehicles in the evening to support the night-time economy. Where the surface may not be level, a dropped kerb crossing is required at regular intervals (every 100m) with tactile instruction for an uncontrolled crossing (see Guidance on the Use of Tactile Paving Surfaces).

11.12.4 Larger VRAs can present access problems for older and disabled people if they have to walk or wheel long distances from public transport stops, or car and cycle parking. Allowing access to disabled car parking spaces or offering mobility scooter hire within the VRA can improve accessibility.

In larger VRAs, guidance tactile paving may also be beneficial to support visually impaired people in navigating routes. This is especially important where traditional orientation cues – such as building lines or kerb edges – are absent, or where obstacles create additional barriers (see Guidance on the Use of Tactile Paving Surfaces).

Figure 11.11: Pedestrian zone signage, Cardiff City Centre



11.12.5 Depending on the type and volume of vehicle movements, it may be necessary to denote a vehicle track through the street using a different surface material or planters/bollards. Using kerbs to define the route may restrict pedestrian movements and will suggest that vehicles have priority at the times they do have access. If kerbs are used, regular dropped kerb crossing points should be provided with tactile paving to guide visually impaired people (see Guidance on the Use of Tactile Paving Surfaces).

11.12.6 Seating, lighting and litter bins will normally be required. Convenient cycle parking is important, particularly for disabled people cycling, who need to park close to shops and other facilities (see chapter 14). All street furniture should be located so that it does not interfere with walking and wheeling desire lines and is able to accommodate servicing and maintenance vehicles where applicable. Street furniture should contrast with background materials to increase its visibility.

11.12.7 Central streets are often prime destinations where shops and services are located. Alternative routes often include heavily trafficked gyratory systems or roads used by HGVs servicing shopping areas, and may pose a greater risk to people cycling. Where people cycling are required to travel longer distances via more heavily trafficked routes around the VRA this will suppress cycle trips and reduce cycle safety. Consideration should therefore always be given to allowing cycling within VRAs (including options for time-restricted access) unless suitable conditions cannot be achieved. Cycling in VRAs can cause concerns to people walking and wheeling, particularly to people with physical, sensory and cognitive disabilities who may not expect people cycling to be present, and this issue can therefore be contentious. For this reason, it is very important that meaningful engagement and consultation is carried out, so a design that is inclusive and accessible can be achieved, to create a space where people feel safe (see chapter 5).

11.12.8 Those walking or wheeling may express a preference for clearly-defined cycle routes. However, this can lead to higher cycle speed and greater potential for conflict with those walking or wheeling. Careful urban design can help to create an attractive and functional environment in which cycle speed is low and people walking and wheeling clearly have priority. The positioning of features such as trees and benches and the use of surfacing materials can suggest a preferred route for people cycling. This approach can help keep people cycling away from areas where people walking and wheeling are likely to be moving across their path, such as near shop doorways, seating areas and children's play areas. Street furniture within VRAs should not compromise visibility to the extent that it becomes hazardous for walking, wheeling or cycling.

11.12.9 Research on cycling in pedestrian areas into the level of conflict between people walking, wheeling and cycling found that people alter their behaviour according to the density of pedestrian traffic and extent of the conflicting movements – as pedestrian cycling flows rise, and where the direction of movement is most varied, the incidence of people cycling choosing to dismount also rises and those who continue to ride do so at a lower speed.

11.12.10 If cycling is prohibited within a VRA for all or part of the day the alternative routes for people cycling should offer equivalent coherence, directness, safety, comfort and attractiveness and meet the minimum design requirements for an active travel route.

11.12.11 Restrictions on cycling may only be required at certain times of day. Permitting cycling before 10am and after 4pm allows commuter cycling while avoiding the busiest periods of walking and wheeling activity. A period when no cycling is permitted is also beneficial to people who wish to be certain of a vehicle-free space for their personal safety. Cycling should not be restricted during times when motor vehicles are permitted even if only for deliveries.

11.13 Reallocation of road space

11.13.1 The reallocation of road space from motor vehicles to active travel modes not only creates better conditions for walking, wheeling and cycling but also makes a statement that active travel is considered to be at least as important as motorised travel. Typically this will involve one or more of the following:

- removal of one or more general traffic lanes.
- reduced width of general traffic lanes.
- removal of centre line.
- removal or relocation of car parking.
- pedestrian-friendly streets with wider footways or informal footway areas protected by features such as planters and bollards within a level surface.

Figure 11.12: Reallocation of road space using light separation features, Ystrad Mynach



11.13.2 Significant kerb line changes may require costly alterations to drainage arrangements, but will sometimes be necessary to properly reallocate road space so that the needs of people walking, wheeling and cycling are met. Early engagement with statutory undertakers can help reveal potential issues or opportunities.

11.14 Separation of people walking, wheeling and cycling

11.14.1 People cycling using off-carriageway tracks, in green spaces and alongside highways, will usually need to interact with people walking and wheeling. The two possible approaches to the design of links where people walking, wheeling and cycling are using the same route are:

- people cycling and people walking and wheeling each have their own segregated space.
- people cycling and people walking and wheeling share the same surface.

11.14.2 Separation between people walking and wheeling and people cycling presents some advantages compared to shared use, such as:

- More comfortable for people walking and wheeling who may not expect the presence of people cycling.
- Less intimidation for vulnerable people walking and wheeling, particularly for visually impaired.
- Reduced perception of conflict by people walking and wheeling, and people cycling.
- Keeps people cycling away from driveways where vehicles can suddenly appear, as the cycle track is usually located next to the carriageway.
- People cycling less likely to encounter pedestrians engaged on ‘exchange’ activities, such as playing, shopping.
- People cycling can maintain a consistent and comfortable speed.

11.14.3 Most women, girls and those identifying as such, prefer cycling on a protected infrastructure or low motor traffic routes. This is due to fear of harassment (high numbers been reported in London see What stops women cycling in London? Report) and also because women often cycle with children (see also Wales National Travel Survey). It is important that meaningful consultation is carried out also aiming at this demography so that the proposed route is not exclusionary (see chapter 5).

11.14.4 Early consultation with relevant interested parties, such as those representing disabled people, people who walk and people who cycle should form part of the development process to inform design decisions. Schemes should also be monitored post-installation, including contact with user groups who may have opposed the scheme to see whether their concerns have been addressed, or whether some additional mitigation is required.

11.14.5 Separation between people walking and wheeling and people cycling presents many advantages compared to shared use, such as:

- More comfortable for people walking and wheeling who may not expect the presence of people cycling.
- Less intimidation for vulnerable people walking and wheeling, particularly for visually impaired.
- Reduced perception of conflict by people walking and wheeling, and people cycling.
- Keeps people cycling away from driveways where vehicles can suddenly appear, as the cycle track is usually located next to the carriageway.
- People cycling less likely to encounter pedestrians engaged on ‘exchange’ activities, such as playing, shopping.
- People cycling can maintain a consistent and comfortable speed.

11.14.6 For segregated paths to operate effectively, there should be adequate width for each user group, and the means of segregation should be effective. If levels of non-compliance are anticipated to be high due to inadequate space for effective separation, options include:

- increasing the path width.
- providing a shared track.
- providing an alternative route for people cycling.

11.14.7 The following should be considered with regard to the need for segregation:

- flow of people walking and wheeling and people cycling (both the volume and any conflicting directions of movement).
- cycle speed.
- cycle journey purpose.
- visibility.
- whether significant numbers of vulnerable users are expected (such people who are disabled, younger or/and elderly).
- available width and any pinch points (such as bridges).
- adjacent activity (such as shopping, playing etc.).

11.15 Type of separation

11.15.1 Design features such as contrasting materials, a grass verge (see figure 11.13), or a change in level can be used but consideration of how people walking and wheeling may need to cross the cycle track should be taken into account. Materials that provide good tonal and texture contrast will help users to differentiate the cycle and pedestrian surfaces and are valuable for visually impaired pedestrians. This could, for example, be using asphalt for people cycling and light coloured paviours for pedestrians.

Figure 11.13: Separated pedestrian and cycle provision



11.15.2 Using a raised white line marking to TSRGD diagram 1049B to separate people walking and wheeling and people cycling is not well observed, and therefore not recommended. However, if widths allow, a mountable, cane-detectable kerb or bolt down unit (such as a trapezoidal delineator) could provide separation between pedestrians and cyclists although consideration should be given to the risk of resulting trips and falls.

11.15.3 Where cycle tracks are provided at the same level as a pedestrian route, they should be clearly designed and marked as cycle tracks.

11.16 Shared use DE401 and DE403

11.16.1 For the purpose of this document shared use is defined as a route or surface which is available for use by people walking, wheeling and cycling, without any physical separating features or markings. Within the highway, it is normally created by converting the footway using the power in section 65 of the Highways Act 1980.

11.16.2 A shared-use path should only be considered when the route involves few points of conflict (with less than 20% of the route directly adjacent to developed frontages with property access) and where motor traffic speeds and volumes are unsuitable for on-road cycling (more than 2500AADT or over 22mph 85th percentile speed) – see figure 11.1 ATNM link design selector. The predicted peak number of users per hour should be less than 100 for shared use to be appropriate. In locations where these conditions are not met, converting footways into shared-use paths should be avoided and considered only as a last resort (for example, for short sections to join up routes, when the space is insufficient for separation provision). Shared-use facilities should adhere to the design guidance outlined in table 11.3.

11.16.3 Shared used paths are not recommended in locations where there is a high proportion of vulnerable users, such as outside hospitals and care homes.

11.16.4 Converting a footway into a shared-use path should be considered only as a last resort and should adhere to the design guidance outlined in table 11.3 and figure 11.1. Shared-use facilities are generally unpopular among all users, especially in areas with high motor traffic volumes. They pose particular challenges for visually impaired people (who often fear this type of infrastructure), users of mobility scooters, and those riding non-standard cycles. Although direct conflict may be rare, the mix of users moving at different speeds can feel unsafe and inaccessible, especially to vulnerable groups.

11.16.5 Where a shared use facility is being considered, early engagement with relevant interested parties should be undertaken, particularly those representing disabled people, and people walking, wheeling and cycling generally. Engaging with such groups is an important step towards the scheme meeting the authority's Public Sector Equality Duty.

11.16.6 In shared use paths the Highway code should still apply, and priority should always be given to the most vulnerable user, which means people cycling should always lookout and give priority to people walking and wheeling. As shared use paths tend to be unmarked without direction lanes, people tend to travel along both sides which can cause conflict. Strategies such as "left is best" presented in the case study in figure 14.9 may be helpful in some cases or signs such as "Share with Care".

11.16.7 Shared use may be appropriate in some situations, if well-designed and implemented and some examples include:

- Alongside inter-urban and arterial roads where there are few people walking/wheeling. This will generally be in locations where there are large distances between accesses, meaning few pedestrians would choose to use the route.
- In situations where a limited length of shared use may be acceptable to achieve continuity of a cycle route.
- On off road routes away from development and property frontages.

11.16.8 Recommended minimum widths of shared use routes are given in table 11.3. Where peak number of users is above 300 per hour, full separation should be used. Where this is not possible, the Design Decision Log in appendix L should be completed with an explanation for the decision. Note that when a shared use route passes a bus stop an absolute minimum width of 2.5m between the boundary and the shelter and/or flag should be maintained, as per DE506.

Table 11.3: Recommended minimum widths for shared use routes

Peak number of forecasted all users (people walking, wheeling and cycling)	Minimum width (m)
Up to 100 users per day.	3.0m recommended, 2.5m acceptable.
Up to 50 users per hour.	3.0m recommended, 2.5m acceptable for less than 100m in constrained locations or for permeability links. Width between 2.5m and 3.0m should not be present for more than 25% of route length.
50-100 users per hour.	3.0m recommended.
100-300 users per hour.	Separation recommended. Shared use facility with a min 4.0m width may be acceptable.
Over 300 users per hour.	Separation recommended. Where not achievable width should be a minimum of 4.5m with a corresponding note in the Design Decision Log.

Notes

1. The minimum widths referred are subject to the additional requirements set out in section 9.8 and section 9.9 when the facility is adjacent to vertical features or a carriageway.

2. Where the minimum width is not achievable, a corresponding note should be recorded in the **Design Decision Log**.

11.16.9 Designers should be realistic about people cycling wanting to make adequate progress. The preferred approach for shared use routes is therefore to provide sufficient space so that people cycling can comfortably overtake groups of people walking and wheeling and people cycling slower.

11.17 Routes and links for people walking and wheeling DE101 and DE102

11.17.1 Pedestrian routes include footways adjacent to carriageways (DE101), footpaths away from roads, such as paths through housing estates, parks and alongside waterways (DE102) and other elements of Public Rights of Way. Where footways or footpaths are being designed as a shared use path for people walking, wheeling and cycling (separated or unseparated) refer to DE401, DE402 and DE403.

11.17.2 Walking and wheeling routes should follow direct desire lines as closely as possible, be of sufficient width for the level of use (see section 9.6), and gradients should be accessible to all users (see section 9.7).

Widths

11.17.3 The required width of a footway or footpath will depend on the flows of people walking and wheeling and whether a separating margin is needed due to high motor traffic speed or large vehicles on the adjacent carriageway.

11.17.4 Minimum widths are given in section 9.6 and summarised in DE101 and DE102. Where pedestrian flows are very high, a detailed assessment of pedestrian capacity and comfort should be made (see TfL Pedestrian Comfort Guidelines, summarised in figure 9.12). If there are high levels of static pedestrian activity such as near tourist attractions, or waiting for public transport or to cross, additional space will be needed.

11.17.5 Footway widths may be increased by reallocating carriageway space and/or removing or rationalising street clutter. Removing unnecessary street furniture and locating remaining furniture in an area out of the main flow of people walking and wheeling helps remove hazards for visually impaired people and can improve the street appearance. Examples of clutter on streets that cause barriers for visually impaired people are:

- Bins and bin bags.
- Overgrown vegetation.
- Pavement parking.
- Signs and A-boards.
- Seating.
- Lamp posts.

11.17.6 Litter bins and other potential obstructions should have a minimum height of 1.0m and be continuous to the ground rather than sited on posts. DE101 provides guidance on the need for hazard protection to isolated objects.

11.17.7 Footway parking can be prohibited with a TRO to enable enforcement if necessary. Physical measures, such as bollards, raised planters or other street furniture along the edge of the footway can prevent unlawful access, while positive provision of marked parking bays can encourage compliance. Additional width of the footway may be required to take into account the lost space used by the physical measures.

Figure 11.14: Cycle track and footway with grass verges



Build-outs

11.17.8 Build-outs can provide additional footway width at particular busy features such as bus stops, and may also provide a traffic calming effect. Build-outs at pedestrian crossings reduce the crossing width and enable pedestrians to wait in a more visible position.

11.17.9 Build-outs should not create the critical carriageway width for cyclists as defined in section 9.21. Consideration should be given to the provision of cycle bypasses, as shown on DE203. If no bypass is provided, the angle taper for a build-out will gradually force a person cycling out into the primary position in the path of other vehicles and should be no greater than 1 in 10.

11.17.10 A build-out should be conspicuous in both daylight and darkness, using a reflective or illuminated bollard when needed.

11.18 Gradients, ramps and steps DE103 and DE104

11.18.1 The longitudinal profile of a footway adjacent to a carriageway should generally follow its vertical alignment, although there may be situations where a footway can usefully be maintained on a steady vertical profile while the carriageway goes through a sharp dip or crest. In these situations, a retaining wall or slope between the carriageway and the footway will be necessary.

11.18.2 The gradients of footways, footpaths and shared use routes should accord with the guidance given in chapter 9, summarised on DE101 and DE102.

11.18.3 Ramps and steps to facilitate a sharp change in level or grade should not be used on a walking route unless it cannot be avoided. The design of ramps and steps is shown in DE103 and DE104.

11.18.4 Steps should normally be provided in conjunction with a ramp to provide accessibility for people wheeling and also people with children on a pram or pushchair. Steps can offer a useful shortcut to maintain desire lines to accommodate a change in level or grade.

Steps should have clearly visible nosings/edges, handrails to both sides, and corduroy warning paving to the top and bottom. Visual contrast between elements will help highlight features such as edges and handrails.

11.18.5 Existing steps on active travel routes should be assessed against DE104, with improvements made if necessary.

11.19 Wheeling ramps DE105

11.19.1 Flights of steps are sometimes unavoidable where a cycle route has been introduced on a historic path, or where cycle access is needed over a bridge, for example at a train station. Wheeling ramps should be added to one or both sides of the flights using steel sections or by forming them in concrete. These facilities will be inaccessible to some cycle users and an alternative route avoiding the steps should be signed where available.

11.19.2 Care should be taken in positioning the wheeling ramp. The ramp should be far enough away from the side-wall to allow people cycling to use it without the side-wall snagging their handlebars (including cycles with wide handlebars), but not so far out as to impede people walking from using the handrail. In practice, the wheeling ramp should normally be directly below the handrail, with enough height difference between them for a bicycle, angled slightly outwards, to fit beneath the handrail.

11.20 Traffic lane widths and car parking

11.20.1 Designers will need to consider the widths of general traffic lanes and parking spaces when designing active travel routes and reallocating space. Designers will need to assess the minimum width requirements of moving and stationary vehicles, and when people cycling are sharing the carriageway, how the lane widths relate to the recommended riding positions (see section 9.16).

Lane Widths

11.20.2 General traffic lane widths of 3.65m (12 feet) have often been provided as standard in the United Kingdom, but lane widths of 3.0 metres have been used in many parts of the country on urban roads for some time, and can accommodate most typical vehicles (including HGVs) at speeds up to 40mph (see section 9.21).

11.20.3 Widths for trunk roads are given in DMRB CD127, although it should be noted that CD224 permits lane widths as narrow as 2.25m in certain circumstances on the approaches to traffic signal stop lines. Further guidance on general traffic lane widths is given in Manual for Streets 2. Care should be taken where a high proportion of HGV traffic is expected to allow sufficient space for cornering and for oncoming HGVs to pass one another. It should also be noted that the mirrors on modern HGVs now extend further out from the vehicle so the minimum lane widths should not be used on roads where oncoming HGVs will meet frequently.

11.20.4 Streets where large vehicles are uncommon and speeds are modest (less than 33mph 85th percentile speed) can accommodate car traffic comfortably within a 2.75m lane. Larger vehicles can pass each other at this width at lower speed with care, but drivers may need to encroach slightly outside of lanes to pass.

11.20.5 Where lane widths are in the critical range of 3.2m to 3.9m given in section 9.21, conditions will be unsuitable for people cycling on the carriageway unless motor traffic speeds and volumes are low enough that drivers can usually cross easily into the opposing lane to pass a person cycling comfortably.

Car Parking Width

11.20.6 Parked vehicles ideally require a standard width of 2.4m for a parking space but in practice this is often difficult to accommodate in existing streets. 2.0m is the preferred minimum, which still provides a margin of error for poorly parked vehicles. Widths between 1.8m and 2.0m are recommended if space constraints require such narrow widths, but these may not be able to accommodate some modern vehicles.

11.20.7 People cycling are taught to ride well clear of parked cars to avoid collisions with opening car doors, and cycle lanes should be separated from car parking by a buffer zone (a desirable minimum of 1.0m and an absolute minimum of 500mm) for that reason (see DE305).

11.21 Cycle lanes DE301 and DE302

11.21.1 Cycle lanes on the carriageway are reserved either exclusively or primarily for the passage of people cycling. Many people feel uncomfortable sharing the road with motor traffic and table 11.1 provides guidance on when cycle lanes may be suitable.

11.21.2 Research on cycling injury risk suggests that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure, and advisory cycle lanes increase the risk of injury. For this reason they should only be used when motorised traffic speeds and volumes are low (see table 11.1).

11.21.3 The design of cycle lanes requires attention to the turning movements of cycle traffic and other traffic:

- people cycling are not physically protected, and it is important that motor traffic speed and volume is appropriate for people cycling to use the carriageway.
- cycle lanes may conflict with other kerbside activities such as parking bays, loading bays, taxi ranks and bus stops. Attention to these design issues (such as inset parking and loading bays, and bus stop bypasses) will help minimise conflicts and hazards.

11.21.4 Mandatory lanes are marked with a continuous white line which must be supported by a TRO to enforce restrictions on parking in the lane. There can be exceptions, such as for emergency service vehicles and access to private driveways, and time limits.

11.21.5 Advisory lanes are marked with a broken white line that indicates motor vehicles should not enter unless it is safe to do so. Mandatory lanes should be used instead of advisory lanes except where the narrowness of the road makes it impossible to install a cycle lane without

allowing vehicles to encroach into it when no one cycling is present. Parking restrictions should apply at all times unless there are clearly justified reasons not to do so.

11.21.6 Raised thermoplastic markings can be used to help deter incursion by motor vehicles.

11.21.7 Cycle lanes are an integral part of active travel networks, but due to the limited protection which they offer, highway authorities are encouraged to consider separation features in the design of new schemes to offer greater physical protection to people cycling, in line with the core design principles.

11.22 Contraflow cycling DE303 and DE304

11.22.1 The permeability for people cycling can be greatly enhanced by exempting them from one-way restrictions, and encourages active travel with connections unavailable to motorised traffic. Retaining two-way cycling should be considered if it is proposed to introduce one-way working for general traffic. The operation of existing one-way streets should be reviewed with a view to permitting two-way cycling wherever safe and practicable. The design should consider the possible impact on people walking and wheeling and whether they can anticipate that people cycling will be travelling in both directions or whether additional signs are needed at crossing locations.

11.22.2 One-way streets and gyratory systems for traffic management are commonplace. One-way streets can significantly reduce the density of the cycling network and some people cycling may then elect to travel illegally against the flow of motor traffic, or do this on the footway.

11.22.3 Contraflow cycling should be signed in accordance with the advice in the Traffic Signs Manual.

Figure 11.15: Light separated cycle contraflow, Abergavenny



11.23 Car parking/loading and cycle lanes DE305

11.23.1 Kerbside vehicle parking or loading can often be dangerous for people cycling especially in a street with high vehicle turnover rates as there is a high risk of vehicle doors being opened into the path of people cycling within the cycle lane. It is therefore necessary that any cycle

lane should pass parking areas with a sufficient dividing strip (buffer zone) or else be of sufficient width to enable people cycling to travel in the cycle lane away from the parking. Inset bays or build-outs may help protect space for people cycling.

11.24 Cycle lanes at side roads DE306

11.24.1 Cycle lanes across side road junctions ensure continuity and help improve cycle safety. Continuous mandatory cycle lanes across side road junctions are not permitted. A road marking to diagram 1010 can be used to mark the lane at the junction mouth (1m line, 1m gap) as in TSRGD. A cycle symbol to diagram 1057 may also be placed within the lane at the junction mouth.

11.24.2 Increasing the cycle lane width at side roads can help encourage people cycling to position themselves further from the kerb to avoid vehicles nosing into the main road, or turning left across the them. Side road entry treatments help reduce the speeds of vehicles turning in and out of the junction (see DE605).

11.25 Cycle lanes with removal of centre lines DE307

11.25.1 The removal of centre lines is useful where carriageway widths would not otherwise permit the introduction of cycle lanes, and as a speed reduction measure.

11.25.2 Where on-coming motor vehicles have to pass each other, both vehicles momentarily pulling over into their respective near-side advisory cycle lanes, having first checked to see they are clear of people cycling. For this reason, a maximum two-way flow of around 4500 motor vehicles a day, or 500 per hour at peak times is recommended. With more motor traffic there is higher risk of conflict between people driving and cycling.

Figure 11.16: Centre line removal to allow advisory cycle lanes, Penarth



11.26 Cycle lanes with light separation DE308, DE309 and DE310

11.26.1 A mandatory cycle lane along the side of a road may be reinforced by light separation from the main carriageway, using a variety of intermittent low-level physical features such as planters, wands (retro reflective collapsible bollards), and other features usually constructed from PVC or recycled rubber. The intermittent obstacles enable people cycling to pass between the cycle track and the carriageway as necessary, to turn right for example. Existing drainage can still be used so the installation cost is minimal compared to conventional kerbed facilities. The creation of any potential trip hazards for people walking and wheeling should be avoided and sufficient space should be allowed for around formal crossing points and at junctions.

11.26.2 These features are not road markings and therefore no authorisation is needed from Welsh Ministers. They are bounded by the solid white line of a mandatory cycle lane, and should be marked with a broken white line at junctions. A vertical feature such as a bollard or wand should be used at the beginning and end of each run to ensure they are visible to road users and to help avoid damage to the separators.

Figure 11.17: Two-way cycle lane using light separation, Ystrad Mynach



11.27 Stepped cycle lanes or tracks DE311 and DE312

11.27.1 Stepped cycle tracks have a cycle facility raised slightly above the carriageway surface but sitting below the level of the footway. This type of solution is common in Copenhagen, and it has been used in Brighton, Cambridge, Cardiff, London, Newcastle and Salford in England.

Figure 11.18: Stepped cycle track, Cardiff



11.27.2 The position of the track immediately next to the main carriageway means that transitions between a cycle lane and a stepped cycle track (and vice versa) are simple and comfortable for the user.

11.28 Cycle tracks alongside the carriageway DE313

11.28.1 Table 11.1 illustrates where protection from motor traffic is necessary to provide people cycling with safe and comfortable conditions.

11.28.2 Cycle tracks by the carriageway should be of adequate width, comfortable, continuous and link into surrounding cycling infrastructure. In most urban locations the conversion of footways to shared use should be the last resort, but this may be appropriate in suburban and rural areas with few people walking or wheeling or adjacent building entrances.

Figure 11.19: Cycle track adjacent to the carriageway, separated from pedestrians, Cardiff



11.28.3 Cycle tracks alongside the carriageway can be either be two-way or one-way. Two-way tracks are usually provided only on one side of the road, unless it is difficult for people cycling to cross major highways. One-way tracks are usually provided on both sides of the road in the same direction as adjacent traffic lanes. Most cycle tracks in the UK have been built as two-way, but in busier locations this can create some difficulties for users:

- retaining priority over side roads/busy accesses is more difficult and it is hard for people driving and people cycling to see one another.
- greater conflict with vehicles at private accesses.
- complexity of design of crossings at traffic signal junctions and roundabouts.
- difficulty of linking with adjoining cycle network at each end of the scheme.
- poor accessibility to development along the route on the opposite side.
- conflict with people walking and wheeling that are crossing the carriageway.

11.28.4 One-way cycle tracks on each side of the road address many of the above issues.

11.28.5 The recommended widths for two-way cycle tracks are the same as for cycle tracks away from the road, including the extra width where there are kerb edges, sign poles, lamp columns, walls, fences and upstands. A 500mm clear space should be provided on either side of the track to allow the whole width of the route to be used (see section 9.6).

11.29 Cycle tracks in centre of carriageway DE314

11.29.1 An option which has been little used in the UK yet is to place two-way cycle tracks in the centre of single carriageway streets, or one way tracks alongside central reservations. This can provide a good facility for cycling along busy highways without encountering obstructions such as bus stops and driveways. Access to and from the central track is critical, and is typically achieved via controlled crossings and at signalised junctions. It will be necessary to ban turns across the central track at side roads, if it is not possible to create a suitable junction. Regular pedestrian crossing facilities will also be necessary.

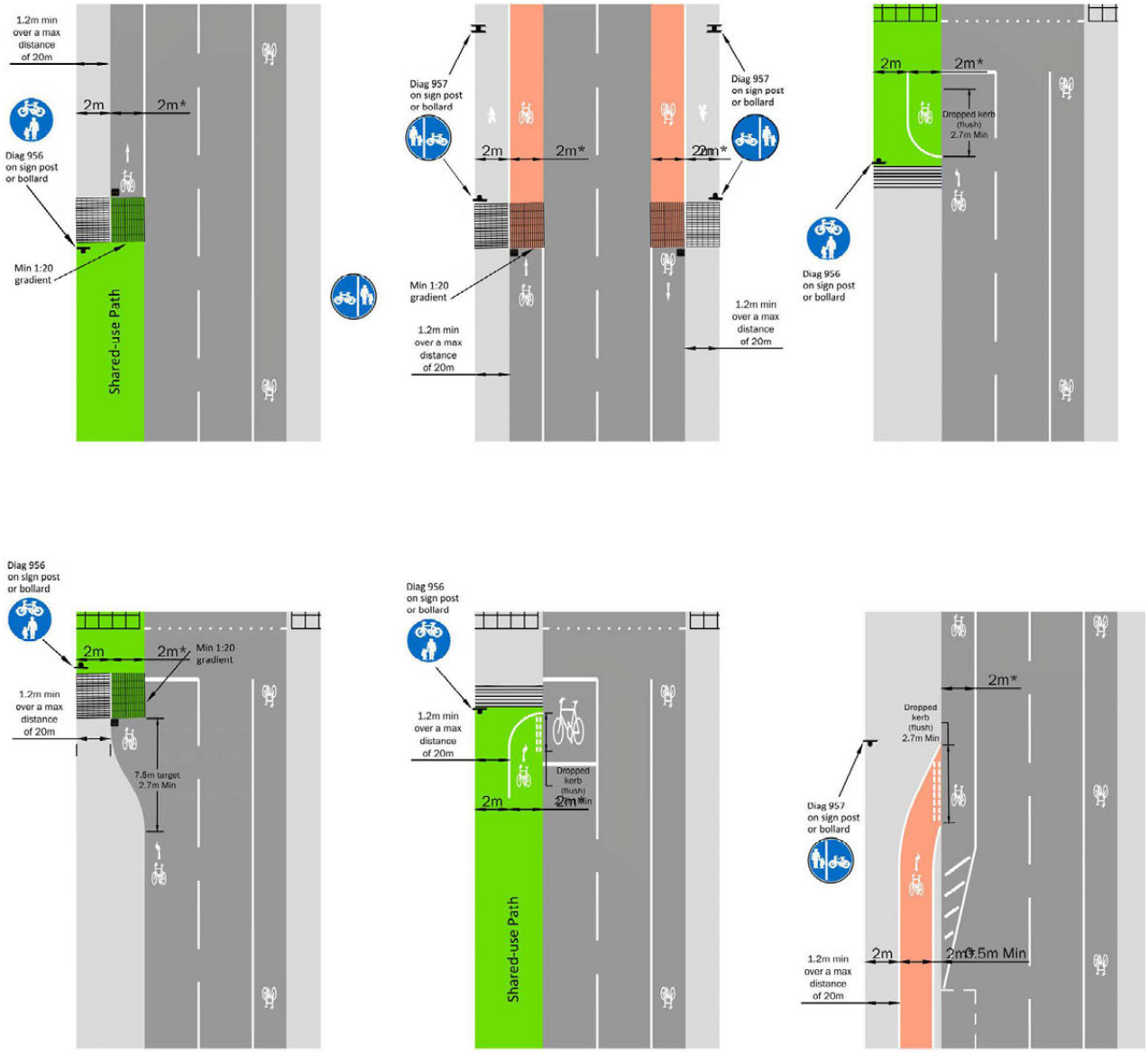
Figure 11.20: Cycle track in centre of carriageway, Birmingham



11.30 Transitions between cycle tracks and the carriageway DE315

11.30.1 The transition for people cycling between a cycle track (including a shared use path) and the carriageway should be safe and comfortable. Where the transition is on a link, people cycling should be able to continue along their direction of travel without bumping up and down kerbs, without having to turn sideways to look behind them and without giving way to vehicles on the carriageway. The design of the transition point should make sure that people cycling are clearly visible so that people driving are aware that they are likely to be re-joining the carriageway ahead. Some example layouts are illustrated below in figure 11.21. More examples of transitions can be found in chapter 9 of the ATE Rural Design Guidance.

Figure 11.21: Example layouts of cycle lane transitions



11.30.2 It is preferable to continue the cycle lane with light separation, even if only for a short section, not least because this prevents the exit-point from the cycle track from being blocked by parked vehicles.

11.30.3 Transitions from a carriageway to a cycle track usually present fewer safety problems for people cycling but should still enable them to continue in a direct line, crossing any (flush) kerbs at right angles.

Figure 11.22: Transition from cycle track to cycle lane, Liverpool



Figure 11.23: Transition from cycle lane to shared use, Deganwy



11.30.4 The type and quality of construction of the kerbs is particularly important if the kerb is to be crossed at a shallow angle, although designs should aim to modify kerb lines so that cyclists cross them at 90 degrees. Figure 11.22 shows an example of a flush kerb. Alternatively, a smooth tarmacadam ramp may be used to create a seamless transition without kerbs.

11.31 Routes away from road DE402 and DE403

11.31.1 Routes away from motorised traffic are referred to as traffic-free routes or greenways. They are usually shared surface but may be separated where the space and budget are available. Routes can be developed in urban, urban fringe and rural areas in a wide range of linear corridors but should offer good connectivity to other parts of the network to achieve high usage.

11.31.2 Common types of motor traffic free routes include:

- urban parks.
- disused railway alignments.
- seaside promenades.
- canal and riverside tracks.
- river and coastal flood banks.
- footpaths and bridleways.
- amenity spaces such as golf course, racecourses, stately homes.
- abandoned road alignments.
- public open spaces within existing and new developments.

11.31.3 Key elements of successful motorised traffic-free routes include:

- routes should be direct and follow desire lines wherever possible, avoiding steep gradients.
- route capacity and widths should be adequate for peak forecast demand conditions.
- minimum visibility and corner radii should be provided, based on the appropriate design speed.
- good quality surface materials should be used.
- routes should have good lighting, drainage and be maintained well, including vegetation clearance.

11.31.4 Restrictive access controls, vegetation growth that encroaches on the track surface, poor or inadequate lighting, poor sightlines or poorly maintained track surfaces will deter users.

11.31.5 Whilst forms of equestrian travel are not considered forms of active travel under the Act, equestrians should not be denied access to routes that they currently have the right to use by changing the classification of the rights of way. There needs to be clear signing of which routes are intended for use by equestrians. If widths permit, a separate unsealed surface may be preferable for equestrians. Where changes are proposed to routes currently used by equestrians, engagement should be undertaken with equestrian groups, as per chapter 5.

Design and construction of routes away from the highway

11.31.6 Traffic-free routes and greenways are popular active travel and leisure routes and the design and construction process should consider:

- Design
  - the connections between the corridor and the wider network.
  - the types, journey purpose and future volumes of users.
  - the available track width and any constraints.
  - the horizontal track alignment and any visibility constraints.
  - gradients and accessibility.

- Construction
  - formation and sub-base.
  - surface dressings suitable for utility cycling.
  - edges and verge treatments.
  - drainage.
  - lighting.
  - ancillary works.
  - surrounding vegetation and tree root protection zones.

Widths

11.31.7 The track width should be able to comfortably accommodate the current forecast and any target increase in users, including from planned land-use development. A width greater than the minimum will increase the level of service, permit sociable (side by side) walking, wheeling and cycling, and accommodate future growth in active travel (see table 9.10 and table 11.3).

11.31.8 Cycle tracks should include additional width where they are bounded by vertical features because it is only practical to use the whole track width to cycle where there is open space alongside.

Junctions between motor traffic free routes

11.31.9 Cycles cannot turn at right angles, and people walking and wheeling will usually cut a corner, so providing a radius that enables cycling speed to be maintained and accommodates the track of larger cycles or cycles with trailers will also help prevent erosion of 'desire lines' in adjacent grassed areas. Blind and partially sighted people use the path edges and turns to aid navigation so additional guidance may be needed to help them at junctions. Junctions between cycle tracks should normally have a minimum 2.0m curve radius or 45° chamfer.

Speed control measures

11.31.10 Speed control measures should be avoided where possible through careful design as they can be a disincentive to users.

11.31.11 Excessive speed by people cycling can be an issue on downhill gradients and on bends where constraints prevent minimum stopping sight distances being provided. Warning signs may have some effect but may need to be complemented by physical measures.

11.31.12 Away from the carriageway, speed control may be integrated into public art using sculptures or landforms to create horizontal and vertical features. Speed control options include:

- speed humps.
- street furniture, including staggered layouts (for example bollards, seating, planting).
- chicane-type deviations.
- rumble strips.
- signs/markings.

11.31.13 The design considerations for speed control measures on cycle tracks also affect people walking and wheeling and section 15.3 should be considered, specific issues include:

- Accessibility.
    - accessibility must be maintained for all legitimate users, including all types of cycle, and navigation and mobility aids.
    - a restriction in track width will slow down users as they negotiate it but also introduces a different type of potential conflict point where users have to give way to one another.

- barriers often cause access problems for people with disabilities and should generally be introduced as a last resort.

- Siting of speed control measures.
  - careful consideration should be given to the location and distance between speed control measures so that they do not impede progress or create additional conflicts between users.

- Visibility.
  - the feature may present a hazard to users and should be clearly visible in daylight and darkness.

- Maintenance vehicle access.
  - the track might require vehicular access for maintenance.
  - any locking mechanisms suitably managed and maintained.

- Prevention of bypassing.
  - bypassing should be prevented or at least not be easier than passing through the speed control measure.

- Speed humps.
  - speed humps profiles must be constructed to acceptable tolerance. DE202 provides details of the preferred sinusoidal hump profile.
  - precast concrete products are available but may be prohibitively expensive, and without a flat base they can also rock and create a trip hazard.
  - speed humps on slopes should not increase the gradient of the hump beyond the absolute maximum 1 in 12.

11.31.14 Further information on traffic-free routes is available from Walk Wheel Cycle Trust: Traffic-Free Routes and Greenways Design Guide.

11.32 Walking, wheeling and cycling on rural roads

11.32.1 Most active travel takes place in urban areas, but roads outside built-up areas provide key links for people who live in rural settlements to make walking, wheeling and cycling journeys to local destinations or nearby urban centres, as well as leisure trips. The use of suitable rural roads offers an economical option to connect destinations and the design of any active travel routes should be sympathetic to the local environment with limited use of intrusive signing and road markings.

11.32.2 On-carriageway routes for walking, wheeling and cycling in rural areas should generally follow roads with low traffic flows, below 1,000 vehicles a day (AADT) or 100 vehicles an hour and with 85th percentile traffic speeds no greater than 22mph (see table 11.1). Speeds this low in rural roads might be difficult to achieve and for this reason, 85th percentile speeds of 33mph may be acceptable in exceptional circumstances (where motor vehicle totals are lower).

11.32.3 A separated footway is always preferred and when possible, in some contexts and conditions, a virtual or implied footway, using road markings and/or marker posts may be appropriate.

11.32.4 In rural routes with a separated footway but where cycling is mixed with traffic, 85th percentile speeds of up to 33mph may be suitable as long as the traffic flows are low (less than 1000 AADT or 100 vehicles an hour).

11.32.5 These levels of traffic should be regarded as upper limits for walking, wheeling and cycling routes and designers should aim for a much lower frequency of around 12 vehicles per hour (an interaction of one vehicle every 5 minutes).

11.32.6 Walking, wheeling and cycling on rural roads can feel hazardous due to higher traffic speeds, restricted visibility and narrow carriageways. Measures to reduce motor traffic speeds and volumes should be implemented to help reduce the risks to people sharing the carriageway.

11.32.7 In rural areas particular consideration should be given to the public rights of way present in the area. Opportunities to tie into this and improve connectivity and accessibility on these routes should be considered, particularly where it caters for active travel journeys.

11.32.8 When planning and designing active travel routes in rural areas, this Active Travel Act Guidance should be followed. Active Travel England's Rural Design Guide can be useful to support professionals as it offers more rural specific options, best practice and examples.

Quiet lanes

11.32.9 Quiet Lanes can be defined as the rural equivalent of home zones and are aimed at making country lanes more attractive for walking, wheeling, cycling and horse riding. Quiet Lanes will have an AADT below 1,000 vehicles or 100 vehicles an hour, ideally much lower, and 85th percentile speeds should be no greater than 22mph (see table 11.1). 85th percentile speeds of 33mph may be acceptable in exceptional circumstances (where vehicle flows are much lower).

11.32.10 Quiet Lane signs should be placed at the commencement and end of designated section. Signs shall be specified and sized as per the Welsh Government standard details drawing No. WAG/P 884 and WAG/P 885.

Figure 11.24: Quiet lane signage



Figure 11.25: Speed control measure at quiet lane



11.32.11 Quiet lanes are designated through a simple resolution of the traffic authority – no Traffic Regulation Order (TRO) is required for the relevant sign to be erected.

11.32.12 In addition to low motorised traffic flows, traffic speeds should be low enough on a potential quiet lane for it to be deemed attractive and safe to people walking, wheeling, cycling and horse-riding, without the presence of physical separation or any designated active travel infrastructure such as footways and protected cycle infrastructure. Where possible a 20mph speed limit would assist in achieving low traffic speeds.

11.32.13 The rural active travel experience can be improved with design features that aim to make rural roads safer and more pleasant places to travel by walking, wheeling and cycling. If a road which has been identified as a potential quiet lane, has motor traffic volumes and speeds above the recommended threshold, additional measures and interventions should be considered to create the conditions which are safe for shared use by non-motorised and motorised users.

Implied footways

11.32.14 A protected implied footway (sometimes known as virtual footways) can be used to narrow the space for people driving and cycling to a single lane. The footway space should be defined by a continuous line marking to diagram 1012.1 (edge of carriageway – see TSRGD), reinforced by occasional bollards, desirably constructed of sympathetic materials such as timber. Bollards should be spaced at up to around 40m apart, with road users always being able to see a bollard ahead. When motor vehicles meet on the single traffic lane, one can pull into the virtual footway to enable them to pass. Larger occasional agricultural vehicles will need to encroach onto an overrunnable verge. To make an implied footway more conspicuous, it may be beneficial to apply a surface dressing in a colour that provides good contrast against the adjacent area of carriageway.

Figure 11.26: Implied footway, Pembrokeshire



Gated closures/restrictions

11.32.15 Closing or restricting access to motor traffic on minor roads is an effective way of improving conditions for people walking, wheeling and cycling. Simple measures can be introduced, such as a modal-filters, or direction signs leading through traffic away from minor roads, so they can be used as active travel routes. Gated closures are to be considered with caution to avoid ambiguity. Local engagement and consultation on TROs will be required, and the maintenance of these routes should also be considered (see chapter 15). Any elements that project to the routes will impact effective widths and allowances are to be made around access, to maintain inclusive mobility.

Changed priorities – junction redesign

11.32.16 Where two minor roads intersect (with two-way traffic flows less than 1,000 AADT on each arm), the road with the major cycle flow should be given priority. This can often be achieved simply by relocating give-way markings and signs, but it may be necessary to undertake works to improve or maintain the visibility splays.

Reduced speed limits

11.32.17 Most of the rural road network is subject to the national speed limit of 60mph. The geometry of many rural roads is inadequate for this speed, and where an active travel route is being promoted, speed limits should be reduced.

11.32.18 Speed limit reductions alone are unlikely to substantially reduce average speeds without additional physical measures, especially at approaches to isolated hazards, junctions and bends (see section 11.7).

Centre line removal

11.32.19 Centre lines can increase traffic speeds since they help guide motorists and give them greater confidence to negotiate oncoming traffic. Removing centrelines on lightly trafficked roads can typically help reduce average speeds by up to 3mph, and may form part of an overall strategy to improve safety.

11.32.20 The introduction of motor traffic restrictions (such as signed HGV alternative routes, and/or weight & width restrictions) can help reduce traffic volume to create suitable conditions for centre line removal.

Gateway treatment

11.32.21 Gateways (usually a vertical sign or gate on each side of the road) are used at a village boundary to raise driver awareness of an approaching settlement where people driving are expected to reduce speed. Lower speed limits and physical traffic calming are often used to help enforce this measure.

11.32.22 Gateways can sometimes form pinch points for people cycling, especially hazardous if 85th percentile traffic speeds are still above 22mph. Where pinch points are intentionally created, cycle bypasses should be provided (see DE203). In rural contexts, narrowings can be used coincidently with gateway or entry treatments to support the reduction of vehicle speeds entering or exiting a quiet lane.

Gateways do not have to take the form of a pinch point as they can be subtly created by using planting, different road colours/materials and other visual changes that mark the contrast between high-speed roads and low speed settlements.

11.33 Temporary infrastructure

11.33.1 During 2020 the Covid-19 pandemic highlighted how quickly the transport environment can change and how using temporary infrastructure allows local authorities to introduce measures to improve the safety and conditions for sustainable and active travel modes in their area to achieve sustained changes in travel behaviour in the future.

11.33.2 Introducing temporary measures to protect public health and safety and to enable people to choose the healthiest and most sustainable transport modes for shorter everyday journeys now and in the future, can be a useful tool to test new infrastructure prior to re-designing whole streetscapes. Engagement (see chapter 5) and monitoring (see chapter 6 and chapter 16) should be included from the concept stage of any project and be a key part of any development opportunity, temporary schemes should follow the same principles of permanent schemes.

11.33.3 Engagement is also needed to ensure that effective consideration is undertaken and provision for protected groups maintained (and improved). Early engagement should be a priority to assist with any TROs that may be required as part of the scheme and will allow local communities to get involved in the early stage designs.

11.33.4 Street design plays a key role in enabling people with some protected characteristics to get around with confidence and local groups and representatives should be involved from the early design stage.

11.33.5 General design approaches to consider when designing for temporary infrastructure are the same as more permanent approaches.

Figure 11.27: Examples of temporary infrastructure



Reducing speed and volume of motor vehicles



Filtered permeability



Reallocation of road space



Vehicle restricted areas



Temporary pedestrian priority

11.34 Cycling and bus

11.34.1 Chapter 13 focuses on the opportunities and benefits of integrating active travel modes with public transport operations. The design considerations to address where cycle routes interface with bus routes are discussed below.

11.34.2 Bus routes are often located on important highway corridors, connecting points of interest that represent people's destinations or/and stops. This also makes those corridors valuable as active travel routes and for this reason, bus routes often coincide with cycling routes. This can create conflict points, due to the number of different users in a small space: people walking or wheeling passing by, people using the bus, people cycling, private motorised vehicles and buses.

Mixed cycle traffic on bus routes DE501

11.34.3 Table 11.1 illustrates where motor traffic speeds and volumes are sufficiently low to permit people cycling to share the carriageway with general traffic. Sharing space with buses will not normally be a problem for people who are confident cycling, subject to appropriate lane widths. Where bus flows are high and form a large proportion of the traffic volume, it is preferable to separate cyclists from buses. Suggested design for when a cycle lane passes a bus stop on route with low bus frequency can be found in DE501.

11.34.4 This section provides guidance on the design of bus stops located on routes used by buses and people cycling, but it is fundamental that each location is assessed individually due to local constraints or characteristics. At every step of planning and design, the aim should be to achieve the best possible outcome in line with the needs of all users. For more information on user needs at bus stops, refer to User needs chapter in ATE guidance: Floating bus stops provision and design (with link to useful resources).

Separated cycle track at bus routes and bus stops DE502, DE503, DE504 and DE505

11.34.5 When speeds and volumes are too high for cycling mixed with motorised traffic, separated cycling infrastructure is usually recommended – see ATNM link design selector in figure 11.1. In these cases, and when there are safety concerns over conflict between people cycling and buses at bus stops, a separated cycle track with a bus bypass is always recommended – see DE502 for one-way cycle track and DE503 for two-way cycle track. The bus stop bypass should be the preferred design for all bus stop intersection with a cycle track and is the only design recommended when the use of the bus stop is high – see table 11.4.

Table 11.4: Classification of bus stop use based on peak flows (people walking and wheeling on the footway behind the bus stop, people using the cycle track by the bus stop and people boarding at the bus stop)

Classification	Low Flow	Medium Flow	High Flow
Walking and wheeling (pedestrians per hour)	Up to 180	180 to 300	More than 300
Cycling (people cycling an hour)	Up to 50	50 to 250	More than 250
Bus users (boardings a day)	Up to 50	50 to 250	More than 250

Figure 11.28: Bus stop bypass, Cardiff

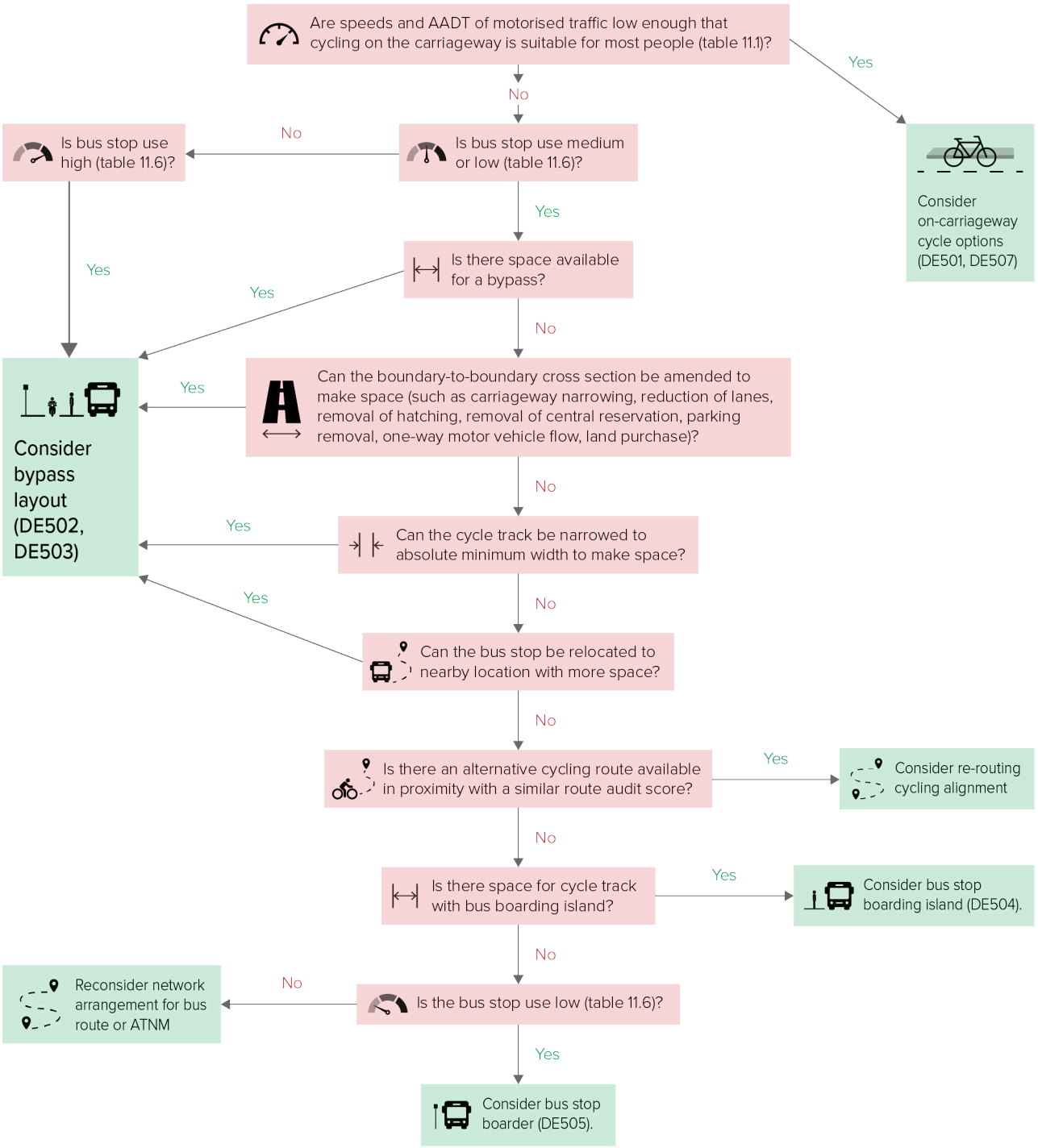


11.34.6 In locations where the boundary to boundary cross section of the carriageway is not wide enough to fit a bus stop bypass, efforts should be made to create the space, such as: removal of bus lay-bys, reducing width or number of lanes, removal of hatchings or central reservations, removal of parking, introducing a one way system or land purchase. Where these actions still do not secure enough space for a bus stop bypass, consideration should be given to: narrowing the cycle track to a minimum at the bus stop, followed by relocating the bus stop to a nearby location with more available space. Where the bus stop bypass still does not fit, and where there is an alternative route nearby that maintains a similar level of provision (direct, safe, coherent, attractive, comfortable) re-routing the cycling link should be considered. This will not always be possible, especially near trip attractors such as urban centres, high streets, schools and transport interchanges.

11.34.7 In the situations where the above measures still do not create enough space for a bus bypass and re-routing is not possible, a cycle track with a bus boarding island (DE504) should be considered. A bus boarder may be considered only in locations where there is no option of creating space for a bus boarding island, and in low flows (table 11.4) but only after thorough engagement with the local community, bus users, bus operators and user groups in the area, especially the ones representing disabled groups.

11.34.8 Where the user numbers at the bus stop are not low (according to table 11.4), or there are other reasons that make a bus boarder inappropriate for the location, if it is still not possible to reallocate space to enable use of another type of arrangement at the bus stop, then the network (active travel or bus) should be reconsidered – see bus stop design selector in figure 11.29.

Figure 11.29: Bus stop design selector



Note: Bus stops that intersect with cycle tracks, can represent challenges for some users, especially disabled, and for this reason early engagement with user groups representing disabled people is highly recommended. Engagement with local users, local cycling groups, bus providers and drivers is also recommended.

Text alternative for figure 11.29: Bus stop design selector

Use the following decision process to determine the appropriate bus stop design.

1. **Are speeds and AADT of motorised traffic low enough that cycling on the carriageway is suitable for most people (table 11.1)?**

- **Yes:** Consider on-carriageway cycle options (DE501, DE507).
- **No:** Continue to question 2.

2. **Is bus stop use medium or low (table 11.4)?**

- **Yes:** Continue to question 4.
- **No:** Continue to question 3.

3. **Is bus stop use high (table 11.4)?**

- **Yes:** Consider bypass layout (DE502, DE503).

4. **Is there space available for a bypass?**

- **Yes:** Consider bypass layout (DE502, DE503).
- **No:** Continue to question 5.

5. **Can the boundary-to-boundary cross section be amended to make space, such as through carriageway narrowing, reduction of lanes, removal of hatching, removal of central reservation, parking removal, one-way motor vehicle flow or land purchase?**

- **Yes:** Consider bypass layout (DE502, DE503).
- **No:** Continue to question 6.

6. **Can the cycle track be narrowed to absolute minimum width to make space?**

- **Yes:** Consider bypass layout (DE502, DE503).
- **No:** Continue to question 7.

7. **Can the bus stop be relocated to a nearby location with more space?**

- **Yes:** Consider bypass layout (DE502, DE503).
- **No:** Continue to question 8.

8. **Is there an alternative cycling route available in proximity with a similar route audit score?**

- **Yes:** Consider re-routing the cycling alignment.
- **No:** Continue to question 9.

9. **Is there space for cycle track with bus boarding island?**

- **Yes:** Consider bus stop boarding island (DE504).
- **No:** Continue to question 10.

10. **Is the bus stop use low (table 11.4)?**

- **Yes:** Consider bus stop boarder (DE505).
- **No:** Reconsider network arrangement for bus route or ATNM.

Additional note

Bus stops that intersect with cycle tracks can represent challenges for some users, especially disabled people. For this reason, early engagement with user groups representing disabled people is highly recommended. Engagement with local users, local cycling groups, bus providers and drivers is also recommended.

11.34.9 The shared use bus stop (DE506) is designed for a shared use route, where the number of users walking, wheeling and cycling throughout align with table 11.3. This arrangement may only be considered in conjunction with a separated walking and wheeling/cycling infrastructure in exceptional circumstances, having demonstrated that all other options were explored and not achievable, and where numbers of users are still low enough for shared use to be acceptable.

11.34.10 The features in series 500 of appendix G respond to the potential for hazardous interactions at bus stops between people walking or wheeling, passengers of buses, motorised vehicles, buses and people riding cycles. People cycling will have varying levels of skills or experience and are likely to include children, inexperienced cycle users, adults cycling with children and disabled people using cycles. Pedal cycle user casualties involving buses and coaches are more likely to result in fatalities than most other single vehicle collisions (see pedal cycle casualties fact sheet).

11.34.11 Concerns have been raised by some disabled groups regarding these design features, especially where people have to cross a cycle track or share a space with people cycling to board or alight the bus due to the fear of collision with a cycle. It is fundamental that special care is taken to make sure the design is appropriate for the environment where it is being used, and respond to accessibility guidance. When cycling is present in the vicinity of bus stops, local authorities should engage throughout the whole planning and design process with relevant stakeholder groups, including user groups representing people with disabilities, groups representing people cycling, local community and bus operators.

11.34.12 These features remain an area of active and emerging research. Significant recent research and guidance includes:

- Guide Dogs UK and University College London Designing for Inclusion.
- Living streets study of inclusive design at bus stops with cycle tracks.
- Active Travel England – Guidance on floating bus stops provision and design.

11.34.13 The advice in this guidance on these features represents current accepted approaches and best practice at the publication date. However, the document will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.

11.34.14 Introduction of these features should always be supported by well selected, impactful behaviour change interventions (see section 7.1), to teach, encourage and enforce good behaviours by all users. These approaches may also be useful if there are significant complaints or reports of issues with existing features, alongside adjustments to layouts and physical features.

11.34.15 No standard layout for cycle lanes/tracks at bus stops can address all considerations but there is a wide range of possible layouts. Each site will need considering on its own merits taking the following points into consideration, along with the bus stop design selector in figure 11.29:

- ensuring there is available space for people cycling to pass a stationary bus (either in the carriageway or to the footway side of the bus stop) in a way that it is safe to do so (maintaining good visibility between users) and that does not exclude potential users for fear of collisions.
- making it clear by design (and signage if necessary) to people cycling that they need to adjust their behaviour and speed to avoid conflict with people around bus stops.
- adequate space for people to wait for the bus that is not in the path of someone cycling.
- sufficient safe space for a bus to deploy a ramp and for a wheelchair and helper to alight and turn.
- good intervisibility between those waiting for a bus as well as those passing by and people cycling, to minimise potential for conflict.
- clear routes to cross the cycle track especially for visually impaired people (such as use of colour, tactiles, push button crossings).
- the number of passengers waiting/alighting, frequency of bus service and flows of people cycling, traffic conditions and available space will determine the best design solution – see table 11.4 and figure 11.29.

11.34.16 The five possible options covered in the appendix G for minimising conflict with people walking and wheeling and buses are:

- cycle lane terminates at bus cage (on road bus stop markings), with alternative route past stop highlighted.
- one-way cycle track bypass to rear of bus stop.
- two-way cycle track bypass to rear of bus stop.
- cycle track with bus boarding island.
- cycle lane/track runs across bus boarder.

Bus lanes and bus-only streets DE507

11.34.17 People cycling are permitted to use with flow bus lanes unless there is a TRO to restrict them. Whilst not specifically a cycle facility, bus lanes can at least provide separation from vehicles other than buses. Taxis and other vehicles (such as motorcycles, or goods vehicles) are sometimes permitted in bus lanes which can increase traffic flows and risks to people cycling because other vehicles accelerate and travel more quickly.

11.34.18 In order to be considered a suitable active travel route, the bus lane should still meet the criteria given in table 11.1 – a separate cycle lane (and potentially a light separated track) will be needed in some circumstances for the route to be considered suitable for inclusion on the ATNM Existing Routes map.

11.34.19 Where bus lanes are provided, care should be taken to ensure that provision for people cycling in the opposite direction is not compromised.

11.34.20 Contraflow bus lanes should be of sufficient width to accommodate people cycling. The widths referred to in DE505 for with-flow bus lanes apply. However, for short stretches, or where flows are low, narrower lanes may be acceptable, which will mean that buses will not be able to pass people cycling.

11.34.21 Where bus-only links are provided, for example between two residential neighbourhoods, the design should normally include provision for people cycling as well (either within the bus lane or adjacent to it).

11.35 Cycling and trams

11.35.1 Only one mile of operational tramway currently operates in Wales. It is important to ensure that any potential future light rail schemes do not compromise the needs of people cycling. There are also a few situations where narrow-gauge railway lines cross or travel along the carriageway.

Figure 11.30: Cycle route crossing heritage railway tracks which run along the carriageway, Porthmadog



11.35.2 People cycling and trams can share the same carriageway but this requires extra care during the design phase, principally to make sure people cycling do not cross the rails at too shallow an angle (on links and at junctions); typically the approach angle should be at least 45 degrees, preferably 60 degrees. Rails embedded in the carriageway contribute indirectly to hazards including:

- people cycling may be concentrating on avoiding the rails and fail to notice other hazards.
- people cycling are not always able to choose a safe path.
- rails restrict the scope for evasive manoeuvres to avoid other traffic danger.

11.35.3 A mix of tram, car and cycle in the carriageway is not appropriate for active travel routes unless there are no alternative route alignments.



Chapter 12: Designing for active travel junctions and crossings

This chapter provides guidance on the design of junctions and crossings. Section 9 (1) of the Act means that highway authorities need to consider how they can improve the conditions for people walking, wheeling and cycling when they construct or change junctions. Section 2(6) of the Act requires local authorities to have regard to this guidance when determining whether a junction or crossing is suitable to be designated as part of an active travel route.

Key areas for consideration include:

- on active travel routes, junctions and crossing design should favour priority for people walking, wheeling and cycling over vehicles.
- the key principles of directness, safety and comfort should guide the design of new junctions.
- reducing vehicle speed and capacity (for example by reducing the number of lanes) at junctions should be considered as well as the provision of well designed active travel crossings and facilities.
- early engagement with groups representing people with sight loss and other disabilities is essential, particularly where unusual or uncontrolled crossings are proposed.
- junction and crossing design should reinforce **highway code** rule H2, which states "at a junction you should give way to pedestrians crossing or waiting to cross a road into which or from which you are turning", and rule H3, which states "Do not turn at a junction if to do so would cause the cyclist, horse rider or horse drawn vehicle going straight ahead to stop or swerve".

12.1 Introduction

12.1.1 This chapter provides advice on the design of junctions and crossings which meet the needs of people walking, wheeling and cycling, in urban and in rural situations. As with route and link design (chapter 11), it should be considered in conjunction with the information in chapter 13, chapter 14 and chapter 15. References to the relevant design elements in appendix G are included.

12.1.2 A junction is where two or more roads or active travel routes meet, with a crossing provided to give people walking, wheeling or cycling safe passage across the carriageway. The type of junction or crossing provided will need to be appropriate to the circumstances of the site and the behaviour and needs of the users.

12.2 Crossing and junction design – general principles

12.2.1 The design of junctions and crossings should be comprehensible to people walking, wheeling, cycling, riding and driving. Directness, safety and comfort are significant for active travel at junctions and crossings. For many potential users, their willingness to use the entire route will be determined by a self assessment of whether they feel safe using the junction or crossing. Designers should therefore give considerable thought to aim for the best layout to be achieved or the entire route risks failing to convert new users.

Directness

12.2.2 Directness at junctions involves both distance and time delay. There is a trade-off in separating pedestrian and cycle movements from other traffic for safety reasons which may introduce additional delay for everybody.

12.2.3 Where possible, design of routes for people walking, wheeling and cycling should avoid arrangements that require frequent stopping and starting.

12.2.4 Delay at a junction or crossing increases journey time for people walking, wheeling and cycling, by both real and perceived inconvenience of stopping. Setting the timings of signal controlled junctions and crossings to reduce delay for pedestrian and cycle traffic may be criticised as reducing capacity for motor traffic but this can be justified with the aim of providing advantage to active travel modes.

12.2.5 Routes through junctions that follow natural desire lines will minimise the effort required for people walking, wheeling and cycling. Where the provided route is indirect, many users may choose a shorter route rather than the intended formal crossing points, potentially putting themselves at risk and also devaluing the new facility. Understanding desire lines from the outset is therefore very important for achieving a successful design.

12.2.6 At side road junctions, deviations from the desire line should be minimised with the use of small corner radii. This also has the benefit of helping reduce vehicle speeds and shorten the length of carriageway to be crossed, increasing safety for people crossing the side road. With small corner radii, larger vehicles might need the full carriageway width to turn (overrunning the centreline), which is suitable in areas where large vehicles are occasional (but not where queues are frequent) (see figure 12.1 and 12.2).

Figure 12.1: The effect of corner radii on people walking and wheeling (from Manual for Streets)

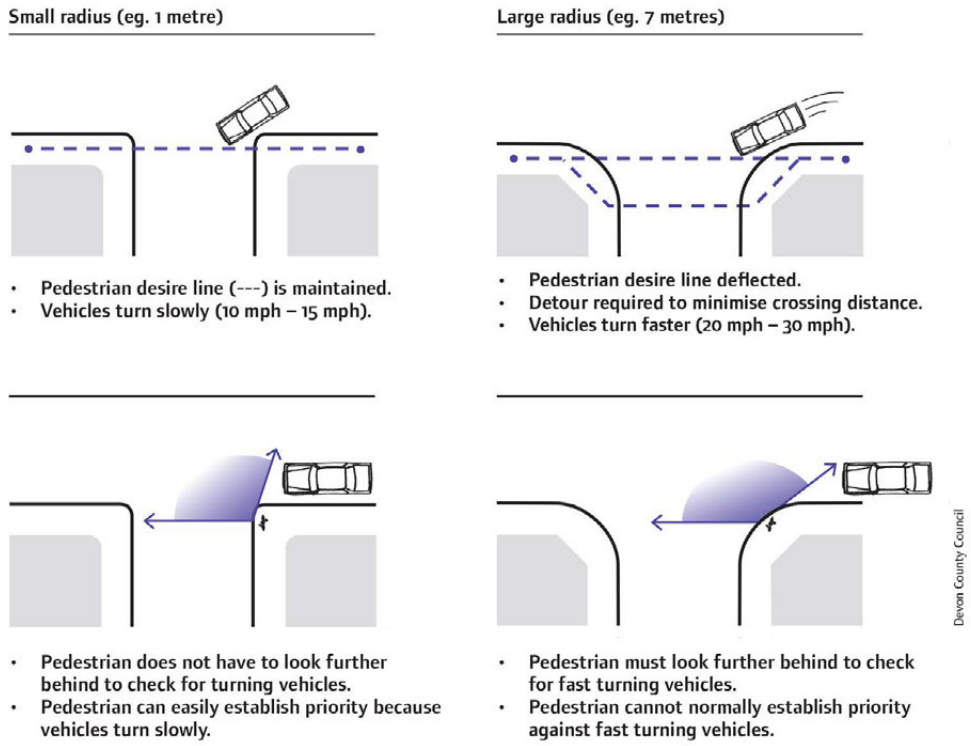
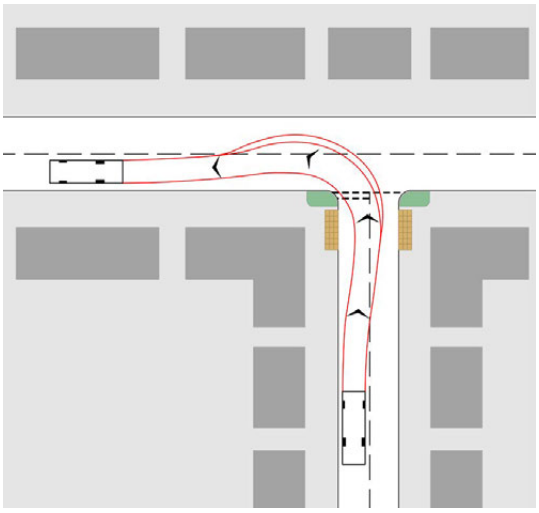


Figure 12.2: Effect of large vehicles turning out of a tight radii junction



Safety

12.2.7 Safe, well designed crossings can help reduce the community severance created by busy roads. Safety is a key consideration because junctions and crossings are a frequent location for collisions.

12.2.8 Perception of safety needs to be considered as well as actual safety. It is fundamental that designers aim to create spaces that feel safe for all users at all times of day and that users that are likely to feel vulnerable (because of their gender identity, age, race, sexual orientation, disability, religion, for example) are considered in the design (see chapter 9).

12.2.9 People cycling and going ahead on a major arm are at risk from vehicles turning in and out of side roads, and some of these risks should be reduced through good junction design.

12.2.10 Good design reduces the risk of injury to people walking, wheeling and cycling by:

- minimising the number of conflicting movements.
- minimising the number of traffic lanes through the junction.
- minimising the distance to be crossed by reducing the width of the motor traffic lanes.
- reducing motor vehicle speeds at potential conflict points – to reduce the number and severity of casualties.
- ensuring good visibility between all road users.
- allowing sufficient signal time for people walking, wheeling or cycling to complete their movements when they are separated from opposing traffic.

12.2.11 Reducing the radii of the junction is of major significance to the safety of the design as it will reduce the speeds of the vehicles, reduce the length of the crossing, and subsequently, the amount of time users will be on the carriageway, and it will improve the visibility for all users.

12.2.12 Signal-controlled crossings and junctions provide safety benefits for people walking, wheeling and cycling by separating opposing movements in time, further details of which are explained within this chapter (section 12.8 and section 12.9).

12.2.13 Road Safety Audits (RSAs) provide an effective, independent review of the road safety implications of engineering interventions for all road users. It is recommended that Stage 1 – 4 RSAs are undertaken on all active travel schemes by professionals with experience in active travel. RSAs shall be undertaken in line with GG 119 on all schemes that make changes to the layout on trunk roads and motorways.

Comfort

12.2.14 Junction and crossing layouts should provide:

- a smooth surface with flush dropped kerbs and appropriate tactile paving.
- careful location of street furniture away from desire lines.
- sufficient space for people walking, wheeling and cycling waiting to cross (including non-standard cycles).
- minimal need to stop and start at side roads and crossings.
- adequate visibility splays and intervisibility between users.

12.3 Considerations for crossings for people walking, wheeling and cycling

12.3.1 The ability to cross the road safely has a major impact on people's ability to undertake active travel. Pedestrian and cycle crossings should always be provided where a route crosses a major road, and be located as close to the desire line as possible. Crossings may be placed at junctions or mid-way between other junction arrangements. Crossings should be incorporated into the traffic signals at signal controlled junctions (see section 12.9).

12.3.2 People walking and wheeling may want to cross the road at any point along a shopping street due to the way they interact with the retail services. Consideration should be given to providing informal crossings at additional regular intervals to supplement the provision of signal controlled crossings. Inclusive mobility suggests crossing points at every 100 metres, where possible, to avoid the need for people wheeling to make lengthy detours to cross the road.

12.3.3 Delays to people walking, wheeling and cycling should be minimised using measures to give them priority, such as direct routes to keep cycle phases as short as possible, providing maximum signal green times for active travel users, and setting signals to respond quickly either when users pass over detection systems or when the control push button is pressed.

12.3.4 Table 12.1 suggests appropriate treatments for a stand-alone crossing of a two-way carriageway. It is a guide only, and individual locations should be assessed on a case by case basis. Reducing the speed or volume of traffic using the carriageway will enable a wider range of options for the crossing design to be considered.

12.3.5 Where there was no previous provision, suppressed demand may mean that crossing flows are higher than anticipated, especially in residential areas.

12.3.6 Crossings should be wide enough to cater for current demand, and projected increases in use. Catering for higher numbers at the design stage will avoid a route becoming compromised because dimensions were set at the minimum required. Once installed, it can be difficult to justify further expense if a crossing needs widening.

12.3.7 All crossings should be at least the width of the approach paths. Therefore, if the approach path is a cycle track, or shared use path 3.5m wide then the crossing should also provide a facility that is 3.5m wide. Controlled crossings must never be less than 2.4m wide as a minimum (see Traffic Signs Manual, Chapter 6).

12.3.8 The highway authority should consult with the police and give public notice of a proposal to implement a new controlled crossing.

12.3.9 Crossing safety is enhanced by using kerb build-outs to reduce the length of the crossing, and by placing the crossing on a raised table to reduce vehicle speeds. Care should be taken to ensure that build-outs do not result in a pinch point for cyclists using the road. Critical widths should be avoided (see section 9.21). Reducing the width of the carriageway, and consequently the length of the crossing, should be prioritised over building a refuge island.

12.3.10 The length of high friction (anti-skid) surfacing on the approaches to a controlled crossing should be determined based on the vehicle approach speeds. The surfacing should continue past the stop or give-way line for at least one metre.

12.4 Crossing types

12.4.1 The options for crossing roads shown in table 12.1 are relevant for:

- uncontrolled at-grade crossings (informal, buff tactile, refuges).
- priority junctions, pedestrian entry treatment and cycle priority (see section 12.5).
- unsignalised controlled crossings (Zebra or Parallel crossings) (see section 12.7).
- traffic signals (Puffin or Ped X crossings, Toucan crossings, Pegasus crossings, signal controlled junctions) (see section 12.8 and section 12.9).
- grade-separation (bridges and subways) (see section 12.11).

12.4.2 At-grade crossings are relatively low cost and can usually be placed on or near to the desire line. Grade separated crossings provide a high-quality route over or under a road or other physical barrier, and are the safest solution for crossing busy roads with 85th percentile speed of 66mph and above.

12.4.3 The assessment of the type of pedestrian or cycle crossing should be in agreement with table 12.1 and Traffic Signs Manual, Chapter 6, which suggest the conditions suitable for different types of crossings. This should also be complemented by engagement with local businesses, residents and user groups, which can highlight local issues that the designers might be unaware and help determine desire lines.

12.4.4 The table categorises crossing provisions in colours red, amber or green:

- Green = Provision suitable for most people.
- Amber = Provision not suitable for all people and will exclude some potential users and/or have safety concerns.
- Red = Provision suitable for few people and will exclude most potential users and have safety concerns.

Table 12.1: Suitable crossings for speed/vehicle flows

85th percentile speed	Total traffic to be crossed (AADT)	Maximum number of lanes to be crossed in one movement	Uncontrolled	Blended side road entry treatment	Cycle priority	Zebra or parallel	Signal control	Grade separated
Up to 22mph	0-2000	2	Suitable for most	Suitable for most	Suitable for most	Suitable for most	Suitable for most	Suitable for most
Up to 33mph	0-2000	2	Suitable for most	Not suitable for all	Suitable for most	Suitable for most	Suitable for most	Suitable for most
Up to 33mph	2000-4000	2	Not suitable for all	Not suitable for all	Suitable for most	Suitable for most	Suitable for most	Suitable for most
Up to 33mph	4000-6000	2	Not suitable for all	Only suitable for a few	Not suitable for all	Suitable for most	Suitable for most	Suitable for most
Up to 33mph	6000-8000	2	Only suitable for a few	Only suitable for a few	Not suitable for all	Suitable for most	Suitable for most	Suitable for most
Up to 33mph	More than 8000	2	Only suitable for a few	Only suitable for a few	Only suitable for a few	Not suitable for all	Suitable for most	Suitable for most
Up to 33mph	More than 8000	More than 2	Only suitable for a few	Only suitable for a few	Only suitable for a few	Only suitable for a few	Suitable for most	Suitable for most
Between 33mph and 55mph	0-10000	1	Not suitable for all	Only suitable for a few	Only suitable for a few	Only suitable for a few	Suitable for most	Suitable for most
Between 33mph and 55mph	0-10000	2 or more	Only suitable for a few	Only suitable for a few	Only suitable for a few	Only suitable for a few	Suitable for most	Suitable for most
Between 33mph and 55mph	More than 10000	Any	Only suitable for a few	Only suitable for a few	Only suitable for a few	Only suitable for a few	Suitable for most	Suitable for most
Over 55mph	Any	Any	Only suitable for a few	Only suitable for a few	Only suitable for a few	Only suitable for a few	Only suitable for a few	Suitable for most

Notes:

1. Table suggests appropriate treatments for a stand-alone crossing of a two-way carriageway. It is a guide only, and individual locations should be assessed on a case by case basis.

2. Reducing the speed and the capacity of the carriageway will enable a wider range of options for crossings to be considered.

3. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow.

4. For new developments where 85th percentile speed data is unavailable, the design speed limit should be used, and traffic calming measures may need to be implemented to ensure compliance.

5. **Side road zebra crossings** are only suitable where both the side and the main road have a speed limit of 20mph and are positioned no more than 5m from the junction markings.

12.5 Priority junctions

12.5.1 The number of active journeys people will make will depend on how comprehensive the network of safe routes is, and how well the routes connect with each other at junctions and crossings. If people walking, wheeling or cycling are required to stop and start their journey at every junction, unlike motor vehicles, then we may not see the change in behaviour that the Act aims for. Providing priority junctions and crossings is key to that aim and highlights to other road users that walking, wheeling and cycling are the priority form of transport in that area. Figure 12.3 shows an informal junction where the uncertainty from the lack of defined priority has been found to be effective in requiring road users to slow down and engage with each other.

Figure 12.3: Informal junction with no road markings, Cheshire



12.5.2 The rules for priority at major/minor arm junctions are indicated by the use of traffic signs and road markings. Priority is normally given to the dominant traffic flow. The dominant flow for people walking, wheeling and cycling may be different from that of motor traffic.

12.5.3 Four overriding principles underpin the design of priority junctions that are safe and suitable for people cycling using the carriageway:

- low speeds – on approaches and through the junction.
- good intervisibility.
- single lane approaches.
- designs that facilitate correct positioning and offer protection for right turns from the major arm.

12.5.4 In several of the following design examples, reference is made to people cycling adopting the primary position. See glossary, chapter 9 and section 9.20 for an explanation of the primary position for people cycling.

12.5.5 When considering these options and any other significant changes to the layout of junctions, it is important to engage early on in the process with user groups in the area, including the ones representing blind and partially sighted people, to ensure that everyone can navigate the junction confidently and safely (see chapter 5).

Unmarked informal junctions DE601

12.5.6 Junctions in urban areas, even on relatively busy routes, can be designed without defined priority as this feature is an effective method of requiring road users to slow down and engage with each other. The application of these principles is becoming increasingly common and has been demonstrated in a range of scenarios, without negatively impacting on traffic capacity or safety. Even complex four-arm junctions with peak period flows in excess of 2500 vehicles/hour can be suitable for this arrangement.

Examples in DE601 include junctions in Cardiff, in Poynton in Cheshire (figure 12.3), in Wrexham and in Pontypridd.

12.5.7 Informal junctions can also use circular paving patterns to indicate roundabout-type priority without the use of road markings and signs. These informal roundabouts are discussed in section 12.10.

12.5.8 This type of junction can work for people cycling on streets with 22mph 85th percentile speed, as long as care is taken to ensure that the paths of motor vehicles through the junction are limited to one lane, so that people cycling can adopt a primary position.

12.5.9 Where kerbs are proposed to be less than 50mm high, tactile paving should be used, to demarcate areas where people walking or wheeling might come into conflict with motorised vehicles or cycles (see Guidance on the Use of Tactile Paving Surfaces).

Shared or segregated pedestrian and cycle crossing of side roads DE602 and DE603

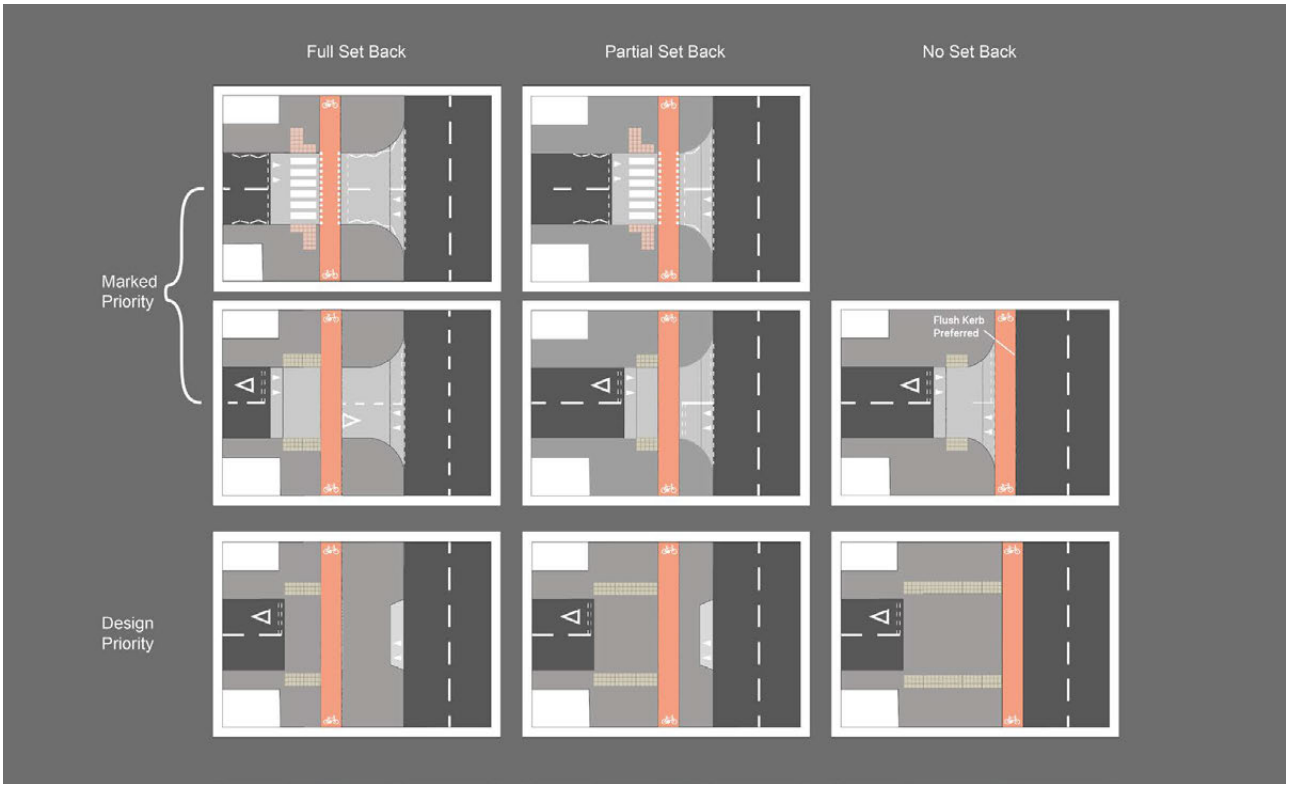
12.5.10 Footways and cycle tracks should give priority to users crossing the side road on the major arm unless this is unsafe. Giving users priority over the side road reinforces the highway code and enables them to continue without loss of momentum contributing to the directness of a route.

12.5.11 Figure 12.4 shows a number of options for providing priority for people walking, wheeling and cycling at side roads in urban areas. These have been classified by position of the cycle facility relative to the major road kerbline. Options also show how priority markings and the use of surfacing materials can combine to help achieve the desired behaviour:

- full set back – at least a car length (5m) from the kerbline.
- partial set back – less than a car length from the kerbline.
- no set back – at the kerbline.

12.5.12 Factors to be considered when determining priority include: location, vehicle speed limit and actual speeds, visibility, number of movements of people walking, wheeling and cycling, number of vehicle turning movements, collision statistics and the feasibility of providing similar priority at nearby side road crossings (to provide greater consistency along a route).

Figure 12.4: Priority cycle track and side road crossing arrangement options



12.5.13 Figure 12.4 also shows how priority road markings can be combined with layout and materials. In the top line, priority is very prominently marked. The bottom arrangement shows continuation of the footway and cycle track surfacing across the junction mouth, and this reinforces the idea that turning traffic at the minor arm is crossing the active travel traffic along the major arm. Please note these sketches are only illustrative and the standard details in appendix G should be consulted when designing.

12.5.14 Side roads and accesses where 85th percentile of vehicle speeds are less than 33mph and volume is less than 2000 vehicles per day will normally be suitable for priority crossings (see table 12.1).

12.5.15 Where the person cycling is expected to give way, TSRGD half-size give way markings on the cycle track will be necessary at road junctions (but not at low use vehicle crossovers where tactile paving would not be used).

Side road entry treatments and blended junctions DE604 and DE605

12.5.16 In this arrangement the mouth of the side road junction is narrowed, the radii is reduced and the level is raised on a flat plateau. This makes it easier and safer for people to cross – particularly those with restricted mobility – by eliminating the height difference to the carriageway and slowing down traffic.

12.5.17 The speed reduction effect of side road entry treatments contributes heavily to the safety of people walking, wheeling and cycling.

Figure 12.5: Blended side road entry treatment, Caldicot



12.5.18 At a 'blended' junction there is no kerb boundary, only tactiles, and the footway material is continued across the junction. Vehicles in this arrangement are crossing a widened footway. This arrangement should be used preferably when the side street is one way but may also be used in two way streets, as long as speeds and flows are low (see table 12.1). They should be used where the flows of people walking and wheeling are high, reinforcing their priority, as per Highway Code: Rule H2. The mouth of the junction should be narrowed to maximise visibility, and raised, preferably with the use of entry kerbs. It is fundamental that the design promotes the vehicle speed to be reduced, preferably forcing the vehicle to cross this type of junction at a similar speed of a person walking.

12.5.19 A blended side road entry treatment is recommended where vehicle speeds and flows are low (see table 12.1), but the number of people walking, wheeling and cycling is high. This arrangement is not suitable where bus routes use the side road or on side roads with high number of HGVs as it requires a small radii to enforce low speeds by design.

12.6 Uncontrolled crossings

12.6.1 An uncontrolled or informal crossing involves the provision of dropped or flush kerbs and tactile paving to enable people to cross to and from the carriageway. People with disabilities and especially people that are blind or partially sighted, generally prefer signal-controlled crossings as they cannot easily tell whether traffic is approaching or how quickly.

12.6.2 Types of uncontrolled crossing include:

- mid link crossing.
- crossing side road junctions.
- informal crossing with a central median.

12.6.3 Care should be taken over the siting of informal pedestrian crossing points in relation to vehicle crossovers so as not to cause confusion for people who are blind or partially sighted. Buildouts, parking and loading restrictions may be needed to ensure visibility is adequate at the crossing.

Simple uncontrolled crossings DE606

12.6.4 People walking, wheeling and cycling will generally be able to cross with traffic volumes up to 2000 vehicles per day, with 85th percentile speeds under 33mph (see table 12.1).

12.6.5 Uncontrolled crossings can be highlighted with a different coloured surface or textured material such as imprint paving, and with changes in carriageway width, such as build-outs. Parked vehicles can obscure people waiting to cross, so buildouts at least of the width of the parking bays and parking restrictions are fundamental for a safe crossing.

12.6.6 Uncontrolled crossings are usually provided across the minor arm at side road junctions for footways or shared use paths. Flush kerbs, perpendicular to the carriageway, should be inset into the side road approximately one metre beyond the end of the radii to ensure that people who are blind or partially sighted are not led into the main carriageway (see Guidance on the Use of Tactile Paving Surfaces). Tighter radii will enable the set-back to be reduced so that people on the footway or shared use path are not diverted from their desire line, will reduce the length of the crossing and will help reduce the speed of vehicles turning into the junction. Alternatively, a side road entry treatment may be appropriate to enable the crossing to be located closer to the desire line – section 12.5.

Figure 12.6: Simple uncontrolled crossing, Caldicot



Simple cycle priority crossing DE607

12.6.7 Where a cycle route crosses a relatively lightly trafficked slow speed urban street, it should normally be given priority over the road. It should be clear to people driving that they must give way, and there must be sufficient visibility between the cycle track and carriageway.

12.6.8 A raised crossing is recommended to reduce traffic speeds locally and encourage people driving to give way, and a coloured surface may be useful to highlight the presence of the crossing to motor traffic.

Figure 12.7: Priority shared pedestrian and cycle crossing over side road, Colwyn Bay



Uncontrolled crossing with central refuge DE608

12.6.9 A refuge in the centre of the carriageway enables users to negotiate one flow of traffic at a time, which can be helpful on wider roads. Refuges are usually kerbed and fitted with signs or reflective bollards facing approaching traffic to provide protection. Flush kerbs and tactile paving should be provided on the footways and refuge in line with the crossing area (see Guidance on the Use of Tactile Paving Surfaces).

12.6.10 A central refuge allows crossing to be undertaken in two easier movements, but the arrangement needs to avoid creating pinch points that can disadvantage people cycling on the carriageway, and the refuge should be wide enough to ensure that wheelchairs, mobility scooters, pushchair and cycles (including non-standard and cycles with a trailer) do not overhang into the carriageway.

12.6.11 Narrowing the width of the carriageway should be prioritised over building a refuge.

Priority junction on opposite side of the road to the cycle track DE609

12.6.12 Where a two way cycle track is on the opposite side of the road to a priority junction a simple arrangement can be used where the cycle track access forms a fourth arm at the junction to create a cross roads arrangement.

Figure 12.8: Cycle track on opposite side to junction, Cardiff



Central median strips DE207

12.6.13 Central median strips provide space for people walking and wheeling to wait while crossing a road in two stages using an area of different coloured or textured surfacing in the centre of a road. Central medians can encourage people driving to give priority to people walking and wheeling at informal crossings.

12.6.14 This type of facility should be in addition to controlled crossings. Central medians can be kerbed, raised or flush with the carriageway surface – see figure 12.9 and because of these features can be more suitable than uncontrolled crossings for people with disabilities, particularly those with sight loss. As with other facilities it is important to engage with user groups as early in the design process (see chapter 5 for guidance on engagement and consultation).

Figure 12.9: Informal median strip, Poynton, Cheshire



12.7 Unsignalised controlled crossings

12.7.1 Unsignalised controlled crossings give people walking, wheeling and cycling priority over other traffic. They provide a more demand responsive and lower cost solution compared to signalised facilities.

Zebra crossings DE610

12.7.2 Zebra crossings are unsignalised crossings with transverse white bars painted onto the road surface, and yellow flashing globes (belisha beacons) on black and white striped poles at each side of the crossing.

12.7.3 A person driving or cycling is required to stop at a zebra crossing when someone walking or wheeling starts to cross. A blind or partially sighted person may not be able to detect whether a vehicle is going to stop to give way to them and therefore may be hesitant about using the crossing. People with learning disabilities and older people may also feel safer and more comfortable using signalised crossings.

12.7.4 Longer length zebra crossings may be divided into two parts by a central refuge or median, which will improve the quality of provision for people who walk or wheel at a slower speed, who will still have the priority to cross. If a refuge is proposed, it should be wide enough to accommodate wheelchairs, mobility scooters, pushchairs and cycles (including non standard cycles) without overhanging into the carriageway. Narrowing the width of the carriageway should be prioritised over building a refuge.

12.7.5 The signing and marking arrangements for controlled and uncontrolled crossings is prescribed in and Traffic Signs Manual, Chapter 6. For zebra crossings the regulations require the installation of a minimum of two zig-zag markings (when is not practical to lay 8 marks) on the approach to and exit from the crossing, to prohibit vehicles waiting or overtaking on the immediate approach.

12.7.6 The zig-zag markings may be placed up to 2.0m from the kerbline, where a cycle lane or a light separated cycle track goes through a crossing, in order to highlight the continuation of the cycle space.

12.7.7 TSRGD allows the zig-zag markings and yellow globes to be omitted at zebra crossings placed across cycle tracks – see figure 12.10. Humps may be placed in the cycle track to slow cyclists at or on the approach to the crossing.

Figure 12.10: Zebra crossing of cycle track, Cardiff



12.7.8 In March 2026, a new TSRGD amendment (see 2026 No 35) states that where a zebra crossing is proposed less than 5 meters from a junction and on a 20mph road (with the main road also being 20mph) illuminated beacons and a controlled area (zig-zags) are not required. These are known as side road zebra crossings and have a specific guidance to support planning and design (see side road zebra crossing guidance). This arrangement gives even more priority to pedestrians crossing the side road and the design and by not having a controlled zone, they can be installed at the mouth of junction, within the desire line.

Figure 12.11: Side road zebra crossing, Cardiff



Parallel crossing for people walking, wheeling and cycling DE611

12.7.9 This type of crossing provides a more demand responsive and lower cost solution to accommodate cycle and pedestrian crossing movements next to each other, compared to signalised facilities (see figure 12.12).

12.7.10 The crossing is similar to a zebra crossing, but with a separate cycle crossing indicated by TSRGD diagram 1055.3 'Elephants Footprint' markings and TSRGD diagram 1057 cycle symbols located between the zebra stripes and the give way line.

12.7.11 The parallel crossing is visually stronger than a cycle priority crossing (DE607) and drivers are more likely to respect the legal requirement to give way. It is therefore suitable for sites with higher motor traffic flows and speeds (table 12.1). It can also be used close to junctions, for example on the entries/exits to roundabouts.

12.7.12 As with zebra crossings, parallel pedestrian and cycle crossings may be divided into two parts by a central refuge or median, which will improve the quality of the crossing for people walking, wheeling and cycling. Reducing the width of the carriageway, and consequently the length of the crossing, should be prioritised over building a refuge island. When building a refuge, they should be wide enough to accommodate wheelchairs, prams and cycles (including unconventional cycles and cycles with a trailer).

Figure 12.12: Parallel crossing for people walking, wheeling and cycling, Swansea



12.8 Signalised crossings away from junctions

Puffin crossings DE612

12.8.1 Puffin crossings have nearside pedestrian red and green symbols located as part of or above the push button unit so that they can be seen at the same time as approaching traffic. Puffin crossings replace pelican crossings which are no longer authorised for new installations. Puffin crossings incorporate detection technology which allows cancellation of the pedestrian demand if someone crosses after pressing the button, but before the green man has activated. Additionally, the detectors are used to measure the speed at which people are crossing and can automatically adjust the time allowed to cross the road.

A puffin crossing has the same light sequence as traffic signal junctions (meaning no flashing amber road traffic signal/flashing green man, as was the case with pelican crossings).

12.8.2 Touchless crossing control buttons are being trialled. Instead of pressing a button, users can wave their hand in front of the button with an additional benefit being to reduce exposure to viruses commonly found on push buttons.

Figure 12.13: Puffin crossing, Brecon



Ped-X crossings DE612

12.8.3 A Ped-X crossing is similar to a puffin crossing in terms of signal sequence and detection, but uses farside pedestrian signal aspects. 'Countdown' displays which show the time in seconds to the end of the crossing period, can be used with Ped-X crossings. Ped-X crossings are more suited to busy locations where people waiting to cross may have difficulty seeing the nearside indicators due to crowding.

Toucan crossings DE613

12.8.4 Toucan crossings are shared crossings, for walking, wheeling and cycling and operate in a similar way to Puffin crossings, but with additional red and green cycle symbols. Toucan crossings may have either nearside or farside aspects and may also include countdown displays.

12.8.5 Preferably, additional push buttons should be installed back from the crossing position to aid those with mobility issues who need additional space or may not be able to dismount. Access to the buttons for people using non standard cycles such as recumbent should be considered. Detection systems should also be considered to identify people walking, wheeling or cycling that are approaching the crossing to speed up the countdown timer and reduce waiting times.

Parallel signalised controlled crossing DE621

12.8.6 When a two way cycle track swaps from one side of the road to the other then this signal controlled crossing arrangement enables people walking, wheeling and cycling to cross in the same stage, but with physical separation from each other.

Figure 12.14: Parallel signal controlled crossing, Stockport



12.9 Crossings at signal-controlled junctions DE615 and DE622

12.9.1 Crossing facilities for people walking, wheeling and cycling can be incorporated into signal controlled junctions. Crossings within signalised junctions may have nearside or far side aspects, countdown timers, and combined pedestrian and cycle signals.

Figure 12.15: Toucan crossing at signal controlled junction, Swansea



12.9.2 Crossing facilities should normally be provided on all arms of a junction, unless there is a strong reason against, which should be highlighted in the project Design Decision Log (refer to template in appendix L). The number of separate crossing stages that a person walking, wheeling or cycling has to use to cross should be kept to a minimum. Consideration should be given to diagonal crossings (see section 12.9.21 and section 12.9.22).

12.9.3 The crossing times should enable all people walking and wheeling (particularly people that travel slower) to cross the road in an unhurried manner. Research by University College London has revealed that the walking speed of 1.2m/s, which is often used to set the length of pedestrian stages, is too fast for 85% of women and 76% of men aged 65 and over. The use of detectors and timing extensions can be used to accommodate people walking or wheeling slower. Where signal stage timings are fixed, slower walking speeds should be considered to accommodate people who may require longer to cross in the locality.

12.9.4 Straight ahead crossings are more convenient for people walking, wheeling and cycling and should be used wherever possible. Signalised crossings may be divided into sections using refuges, with each part of the crossing operating on different stages of the signals for traffic capacity reasons. In the past, such crossings have often been staggered, with people walking and wheeling having to cross each carriageway separately. There is an increasing number of examples of straight-ahead signalised crossings with wide central refuges that operate under separate stages. Staggered crossings involve additional delay and deviation from the desire line, particularly where the stagger is large. Single stage crossings should be preferred, as they are more beneficial for walking, wheeling and cycling, by reducing waiting times which improves directness. The distance to be crossed should be minimised in all types of crossing, but when not possible, and the distance to be crossed is long, consideration should be given to allowing a safe place to rest (even in single stage crossings) as some users might need to stop half way.

12.9.5 Audible and tactile signals must be provided as these are essential for deaf, blind and partially sighted users. The volume of an audible signal can be manually adjusted to suit the environment. Where there are several crossings in proximity, standard audible signals may cause confusion. ‘Bleep’ and ‘sweep’ audible signals can be provided. These use a directional speaker and an adjustable volume to assist people walking and wheeling in the vicinity of the crossing.

12.9.6 Tactile signals are rotating cones located on the underside of the push button unit. Rotating cones are always placed on the right-hand side of a crossing and must not be obscured by guard rail.

Cycle facilities at signal-controlled junctions

12.9.7 Signal-controlled junctions help people walking, wheeling and cycling during peak traffic periods by enabling them to make turning or crossing movements which would be difficult where the priority is left uncontrolled. When designing signalised junctions, all movements and potential conflicts by all modes should be analysed. This will help reduce journey times and improve safety for people walking, wheeling and cycling. Separation of movement for each mode may be deemed necessary on safety grounds but can add significant delays for all and so should be assessed following active travel principles and the sustainable transport hierarchy (see figure 3.3).

12.9.8 Minor timing changes to existing signal junction operation and lane markings can provide advantages to people cycling at some junctions without complex re-signalling works. Traffic modelling and simulation help determine how signal timing changes might operate and should be used during the design process. However, consideration needs to be given to the Active Travel Act which recommends priority for people walking, wheeling and cycling. Also, very often when the capacity of the road is reduced, vehicle volumes can also decrease in similar proportion, by an effect called 'Traffic Evaporation'.[1]

Intergreen times

12.9.9 People cycling through a signal-controlled junction (or shuttle, or roadworks) at the end of the green phase may be travelling significantly slower than motor traffic, due to an uphill gradient for example. Intergreen times should be adjusted to ensure that people cycling can clear the junction before opposing traffic movement is started. Alternately an all-red phase can be triggered when someone cycling is detected.

Advanced Stop Lines (ASLs) DE614

12.9.10 An Advanced Stop Line (ASL) enables people cycling to take up the appropriate position in the 'reservoir', or waiting area between the two stop lines, ahead of general traffic, before the signals change to green. A cycle feeder lane is normally provided which will enable people cycling to pass queuing motor traffic on the approach to the stop line. ASLs are widely used and some local highway authorities have a presumption to install ASLs at all signalled junctions.

12.9.11 ASLs will not resolve all problems for people cycling at traffic signals. ASLs provide benefit to people cycling on an approach when the traffic signals are on red. They have little value on approaches that are free-flowing, and/or approaches with multiple lanes, as people cycling will find it difficult to manoeuvre themselves into an offside lane to make a right turn. In these situations, alternative solutions should be considered.

12.9.12 Feeder lanes are usually provided on the nearside, but where there are high numbers of left turning vehicles crossing people cycling going ahead or right, central or offside feeder lanes between general traffic lanes may be considered.

12.9.13 'Gate' entries to ASLs are an option which allows legal entry to the reservoir where a lead-in lane cannot be achieved. However, a lead-in lane is preferable and gates represent a lower level of service for people cycling.

12.9.14 ASLs are not permitted at non-signalised junctions, or toucan/puffin crossings.

1 S. Cairns, S. Atkins, and P. Goodwin, (2001) Disappearing traffic? The story so far, Municipal Engineer 151: 13–22 (see useful resources). Cairns, S. Goodwin, P. Hass-Klau, C. 1998. Evidence on the Effects of Road Capacity Reduction on Traffic Levels (see useful resources).

Cycle signals

12.9.15 An 'early start' signal phase for people cycling (also known as a 'cycle filter') in conjunction with an ASL enables people cycling to start ahead of other traffic (at the start of the green stage) to avoid potential conflict with traffic on the same arm (for example overtaking and turning left) or opposing traffic streams. Under this arrangement a green light for people cycling is illuminated for a few seconds at the start of the stage and is followed by the green signal for all traffic. These timings should cater for people cycling slower that might take longer to get speed.

12.9.16 Including early start cycle signals in a junction design does not require any form of authorisation.

12.9.17 Low level cycle signals may be used instead of, or as a repeater, to high level cycle advance signals. Low-level signals are easier for people cycling to see when at a stop line, though if there are several people cycling waiting at the lights, those to the right of the group cannot always see the low-level signal on the left hand side of the road. It is therefore important to also provide a far-side repeater at any junction with significant cycle flows.

12.9.18 A dedicated signal stage for people cycling can be used where a cycle-only arm joins a signalised junction. Cycle signals enable cycle and motor traffic movements to be separated in time which promotes safety. The signals can operate on demand, using detector loops or push buttons, or included within fixed staging.

12.9.19 Cycle-only signals are illustrated in figures 12.16 and 12.17 and can be useful, for example:

- hold the left turn (DE618) where people cycling using a nearside cycle track are given a dedicated green signal while the left turn across the track for general traffic is held on red.
- where people cycling undertake a manoeuvre not permitted for other traffic, including people walking and wheeling, such as travelling between the carriageway and a cycle track, or making a turn that is banned to other traffic.

Figure 12.16: Early start low level cycle specific light, Cardiff



Figure 12.17: Separate cycle stage with high and low level cycle signals, Cardiff



Permanent green cycle signal on bus gate

12.9.20 Traffic signals can be used at bus gates to provide queue relocation on the approach to a signalled junction. Several cities, including Cambridge, have incorporated a permanent green cycle aspect on the bus gate signal as there is no need to stop people cycling when other traffic has a green signal.

Diagonal pedestrian and cycle crossing stage during all red

12.9.21 A direct diagonal crossing at a signalised cross-roads may be preferable to directing people walking, wheeling or cycling across one arm at a time. Diagonal crossings will increase the overall crossing distance that a person walking, wheeling or cycling is required to make in one movement – therefore increasing the length of the red stage for other traffic – but it allows users to replace a "two-stage" crossing movement with a "single-stage", reducing their journey times and therefore providing a desirable advantage to active travel modes. An example from Cardiff is shown in figure 12.18.

12.9.22 At junctions where people walking and wheeling cross on an all red stage, it may also be feasible to install a diagonal crossing for people cycling without increasing the duration of the vehicle all-red stage, because people cycling are travelling more quickly and take less time to cross.

Figure 12.18: Signalised junction with toucan diagonal crossings, Cardiff



Cycle bypass at traffic signals DE615

12.9.23 Where there is space and relatively low levels of use by people walking and wheeling, a slip off in advance of a signalised junction, leading to a short section of cycle track, will enable people cycling to bypass a red signal (see figure 12.19).

12.9.24 This is commonly used:

- to turn left.
- to continue straight ahead across the head of a T junction.

Figure 12.19: Ahead-only cycle bypass



Uncontrolled cycle crossing at signalled junction

12.9.25 Operational considerations may make it difficult to justify a separately controlled crossing for people cycling. In such cases it may be appropriate to consider an uncontrolled cycle crossing on an arm of the junction, with give way markings on the cycle track, as it approaches the junction. This also has the advantage that people cycling are not faced with a full red signal at a time when it is safe for them to proceed at caution (see table 12.1).

Guiding people cycling through signalised junctions DE616

12.9.26 A cycle lane marked through a signalised junction provides a visible indication of route continuity and can increase people driving awareness of key cycle movements. They are commonly used in two situations:

- to indicate route continuity and protect space for cycling desire lines on important cycle routes.
- to mark out cycling turning manoeuvres where these are different to the path of other vehicles.

12.9.27 In terms of road markings, diagram 1010 (TSRGD) should be used for the cycle crossing within the junction over diagram 1004 as it is more prominent (see figure 12.20 and figure 12.21).

12.9.28 Route markings through junctions will be subject to high levels of wear and will require maintenance.

12.9.29 Where it is necessary to indicate a less obvious cycle-only route for people cycling through the carriageway at a signalised junction it may be marked using “Elephants Footprints” markings.

Figure 12.20: Cycle crossing throughout junction, Cardiff



Figure 12.21: Cycle crossing throughout junction, Cardiff



Two-stage right turn at traffic signals DE617

12.9.30 When people cycling approach a junction on a nearside cycle track, advanced stop lines are impractical for turning right. A two-stage turn arrangement provides a right turn facility for people cycling at a signalised crossroads as an alternative to an ASL. It can be of particular benefit on a multi-lane approach where speed and volume of motor traffic makes the execution of a conventional right turn manoeuvre hazardous and unpleasant for people cycling, even with an ASL.

12.9.31 Someone cycling wishing to turn right at a crossroads is able to pull-in to a waiting area in the exit mouth of the road on their left and wait there until that road has a green signal, at which point people cycling can complete their right turn (see figure 12.22).

12.9.32 People cycling waiting to complete the right turn in advance of the stop line should be able to see a secondary signal on the far side of the junction in order to know when it is safe to proceed.

12.9.33 An 'early start' signal phase for people cycling using low level signals can be used to reduce conflict with left turning traffic.

Figure 12.22: Two-stage right turn signalised junction



Hold the left turn DE618

12.9.34 A short section of cycle track can be introduced on the approach to a signalised junction so that people cycling can be held while the traffic is turning left, and vice-versa, the left turning traffic can be held while the people cycling are going ahead.

Protected junctions and cyclops junctions DE619

12.9.35 Where further protection above a hold-the-left-turn arrangement is required, a fully protected junction or cyclops should be considered. In this configuration cycle tracks either side of the carriageway feed into parallel pedestrian-cycle crossings (signalised) that operate during an all-red phase of the junction. Designers should appropriately consider the potential issue of the cycle track being crossed by people walking and wheeling without a signalised control, when considering this arrangement. In the cyclops variant that has been installed at locations in Greater Manchester, the pedestrian crossings are on the inside and the cycle tracks on the outside. This means that the uncontrolled pedestrian crossing of the cycle track is not directly in line with the controlled crossing of the carriageway.

Figure 12.23: Four way signal controlled junction with provision. Commonly referred to as a cyclops junction for people walking, wheeling and cycling



Trixi mirrors (blind spot mirrors)

12.9.36 Blind spot roadside mirrors are large convex mirrors installed at signalised junctions to enable people driving large vehicles (buses and HGVs) to see down the nearside of their vehicles. They are intended to help address the significant proportion of serious casualties caused when large vehicles turning left cut across people cycling on their nearside. When retrofitting Trixi mirrors as a safety measure at an existing junction, the designer should consider whether guard rails can be removed as some fatal collisions have involved people cycling being crushed between the HGV and the guard rail. Where this risk is present, full separation of the cycle track should be considered before proposing the installation of the mirror (see table 11.1). Designers should explain the option selected in the Design Decision Log (see appendix L).

Figure 12.24: Trixi mirror on cycle superhighway 7, London



Cycle track alongside one-way carriageway at cross-roads DE620

12.9.37 Where a cycle track provides a two-way cycling facility alongside a one-way carriageway and intersects with a minor road where there is on-carriageway cycling, this signalised layout can be used, which allows people walking and wheeling to cross in a single controlled phase. The junction is fully signal controlled, with advanced stop lines for people cycling on the minor arms and signal control of the cycle track.

Two-way cycle track at larger cross-roads DE622

12.9.38 Where a two-way cycle track along a main road intersects with a minor road where there is on-carriageway cycling, then this potential arrangement can be used to accommodate all movements. The junction is signal controlled, with advanced stop lines for people cycling on the minor arms and signal control of the cycle track. Pedestrian crossing areas are also signal controlled.

12.10 Roundabouts

12.10.1 Roundabouts offer vehicle capacity advantages over other forms of junction but can be hazardous for people walking, wheeling and cycling when designed in accordance with typical UK practice. Conventional roundabouts have entries and exits that are flared, with two or more lanes to increase vehicle capacity, and wide circulatory carriageways which are often unmarked. Deflection may be less than desirable because of the constraints on the space available. The relatively smooth path for motor vehicles can result in high traffic speeds through the junction and on the exit, particularly on large diameter roundabouts and should therefore be avoided for active travel routes.

12.10.2 Active travel routes can also avoid large roundabouts via grade separated facilities or a completely separate route away from the junction.

Provision at signalised roundabouts

12.10.3 Signalising larger roundabouts can assist people walking, wheeling and cycling by controlling conflicting traffic movements. Many of the measures described below can be applied at the individual arms around a signalised roundabout.

12.10.4 Many people will not feel comfortable using a large roundabout and are likely to prefer an off-carriageway route, directly through the centre or with signal control across the busier entries and exits, see figure 12.25.

Figure 12.25: Signalised roundabout, Cardiff



12.10.5 ASLs should normally be considered for each entry arm and if stacking space permits ASLs may also benefit people cycling on the circulatory carriageway. Providing an early start signal for people cycling may also be beneficial.

Provision at unsignalised roundabouts

12.10.6 For people with less experience of cycling, finding a safe position to occupy in a wide circulatory carriageway is difficult, and people cycling are at risk of not being noticed by people driving entering or leaving the junction.

12.10.7 Roundabouts with a dedicated left turn slip lane to increase vehicle capacity pose an additional hazard for people cycling, where the lane diverges and where a person cycling travelling straight ahead will leave the roundabout with fast moving traffic coming up on the nearside. They are not recommended for active travel routes wherever on-carriageway cycling can be expected.

12.10.8 Two ways to provide active travel infrastructure at roundabouts are:

- mini or compact roundabouts where traffic volume and speed is relatively low, and the lane width relatively narrow so that people cycling can occupy lane entries, exits and the circulatory carriageway in the primary/follow me position.
- at larger roundabouts, where traffic volumes and speeds are higher (see table 11.1 and table 12.1), provide an off-carriageway track around the junction, with parallel crossings or signal controlled crossings of the entries and exits.

12.10.9 The following design approaches will help make roundabouts safer for active travel:

- measures to maintain vehicle speeds to under 22mph 85th percentile speed through the junction.
- reduce the amount of space for motor traffic.
- raise driver awareness of people cycling.
- provide unobstructed passage for people cycling through or around the junction.

12.10.10 Cycle lanes on the outside of the circulatory carriageway are not normally recommended, even on compact roundabouts, since people cycling using them are vulnerable to 'left hook' collisions with motor vehicles exiting the junction.

Mini roundabout DE623

12.10.11 A mini roundabout, where the external diameter is not greater than 15m, can be an alternative to a priority junction. The design of mini roundabouts is included in CD116 of the DMRB. By providing tighter radii, mini roundabouts help reduce vehicle speeds, and can be included in traffic calming schemes. Single lane approaches mean that people cycling and driving pass through the roundabout in a single stream. The equal priority to all arms can help people cycling who might otherwise struggle to turn across moving traffic. Mini roundabouts can be a low-cost measure to improve junction capacity compared to traffic signals.

12.10.12 Three-arm, and quieter four-arm, roundabouts are relatively safe for cycling, but busier four arm, and combinations of double roundabouts may be uncomfortable and less safe from the perspective of someone cycling and so should be avoided on active travel routes.

Figure 12.26: Mini roundabout, Cardiff



Compact (or "continental") roundabouts DE624

12.10.13 Compact (or continental style) roundabouts are included in CD116 of the DMRB and have tighter geometry that is more cycle friendly than conventional UK roundabouts. The geometry encourages lower vehicle speeds, enabling people cycling in the primary/follow me position to pass through the roundabout with other traffic. Compact roundabouts are therefore acceptable where cycle routes are within the carriageway, which is subject to appropriate speeds and motor traffic volumes (see table 11.1).

12.10.14 Compact roundabouts have arms that are aligned in a radial pattern, with unflared, single lane, entries and exits, and a single lane circulatory carriageway. Deflection is greater, meaning that the roundabout can be an effective speed reducing feature. Compact roundabouts are suitable for speed limits up to 40mph. Compact roundabouts will usually have a lower traffic capacity than conventional roundabouts, but performance can still be assessed using standard traffic analysis tools.

Figure 12.27: Compact roundabout, Waltham Forest, London



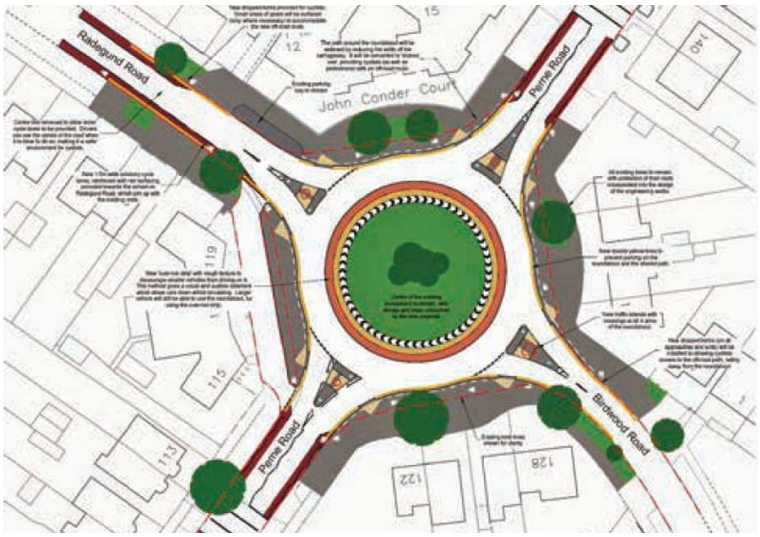
Conventional unsignalised roundabouts

12.10.15 Conventional geometry roundabouts (referred to in DMRB CD116 as Normal Roundabouts) with multi-lane flared approaches and wide circulatory carriageways are generally unsuitable for on-carriageway cycling and so no Design Element has been provided. Conventional roundabouts of this type should not feature on active travel routes unless suitable modifications are made.

12.10.16 The options to consider where a cycle route runs through a conventional roundabout are:

- redesign with compact geometry (see DE624).
- provide separated cycle tracks with toucan, or parallel pedestrian/cycle crossings on each arm.
- introduce signal controls to the roundabout, with appropriate cycle facilities.
- replace roundabout with a signalised junction and cycle facilities.

Figure 12.28: Design for the conversion of existing conventional roundabout to compact roundabout, Cambridge



Dutch style roundabout DE625

12.10.17 The parallel zebra crossing facility in TSRGD offers the opportunity to construct a 'Dutch Style' roundabout with full priority crossings for people walking, wheeling and cycling. It has the continental geometry with arms that are aligned in a radial pattern, with unflared, single lane entries and exits, and a single lane circulatory carriageway.

Figure 12.29: Dutch style roundabout, Cambridge



Informal roundabouts at unmarked junctions

12.10.18 Some authorities have installed unmarked junctions that are designed to encourage people driving 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 (see section 12.5 and DE601).

12.10.19 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. The use of circulatory patterns is appropriate where there is a high proportion of turning traffic, which would otherwise tend to give way to oncoming traffic in the centre of the unmarked space.

12.10.20 This type of junction can work well for people cycling as long as care is taken to ensure that vehicles only circulate in one traffic stream and travel slowly, so that people cycling can adopt a primary/follow me position when passing through the junction, in a similar way to the compact roundabout.

12.11 Grade separated crossings

12.11.1 Separating pedestrian and cycle movements vertically across links and at junctions, as well as at barriers such as rivers and railways, can provide a high level of service because users are removed from any conflict with motor vehicles and are not required to stop or give way. This approach is more likely to be suitable on larger roads with higher speeds.

Pedestrian and cycle bridges DE626

12.11.2 Well-designed bridges enable people walking, wheeling and cycling to cross major roads or other barriers without conflict or delay. New bridges can be designed as attractive features along a route and help to highlight how important active travel is as a mode of transport. Bridges are usually cheaper to install than new subways. Separation between people walking or wheeling and people cycling is preferred in busy locations (see section 11.16 for when shared use is acceptable).

Figure 12.30: Separated cycle track on Cardiff Bridge



12.11.3 Where the topography is favourable the need for approach ramps can be minimised. Ramp design should be considered at an early stage with approaches to the deck straight or nearly straight, as right-angled turns are difficult for people wheeling and cycling. Additional stepped provision can also be considered for direct access where long ramps are required (see figure 12.31).

12.11.4 Good natural surveillance improves personal security and sloping sides are preferred to increase natural light and as well as improve sense of security, especially for people that might feel vulnerable in isolated spaces.

Figure 12.31: Bridge over railway, Newport



12.11.5 Existing road bridges may have very high cycle flows and can be adapted to accommodate cycle tracks, as shown on the example from Cardiff in figure 12.30. Existing structures with narrow footways, restraining barriers or lower parapets should not be discounted, as it may be feasible to reduce the carriageway width or provide a cantilevered structure.

Subways and underpasses DE627

12.11.6 Well-designed underpasses can provide useful connections along footpaths or cycle tracks to cross under major roads, railways and watercourses. Where the topography is favourable the need for approach ramps can be minimised. Sometimes this option will involve the conversion of an existing pedestrian subway or an underpass which may be substandard, but still offers a safer solution than at-grade crossing.

12.11.7 Lighting and good natural surveillance are essential for personal safety. If these conditions are not met, the route is likely to exclude some users at certain times of the day.

Figure 12.32: Pedestrian/cycle underpass, Port Talbot





Chapter 13: Integration with public transport and cycle hire

This chapter provides guidance on the integration of walking, wheeling and cycling with public transport at stops, stations and interchanges. Details on cycle hire and park and cycle schemes are also provided in this chapter; demonstrating how these facilities provide active travel integration with public transport and therefore extend the number of people who can use active travel for everyday journeys.

Key areas for consideration include:

- connectivity with active travel routes at interchanges and public transport stops.
- carriage of cycles on public transport.
- public cycle hire.

13.1 Introduction

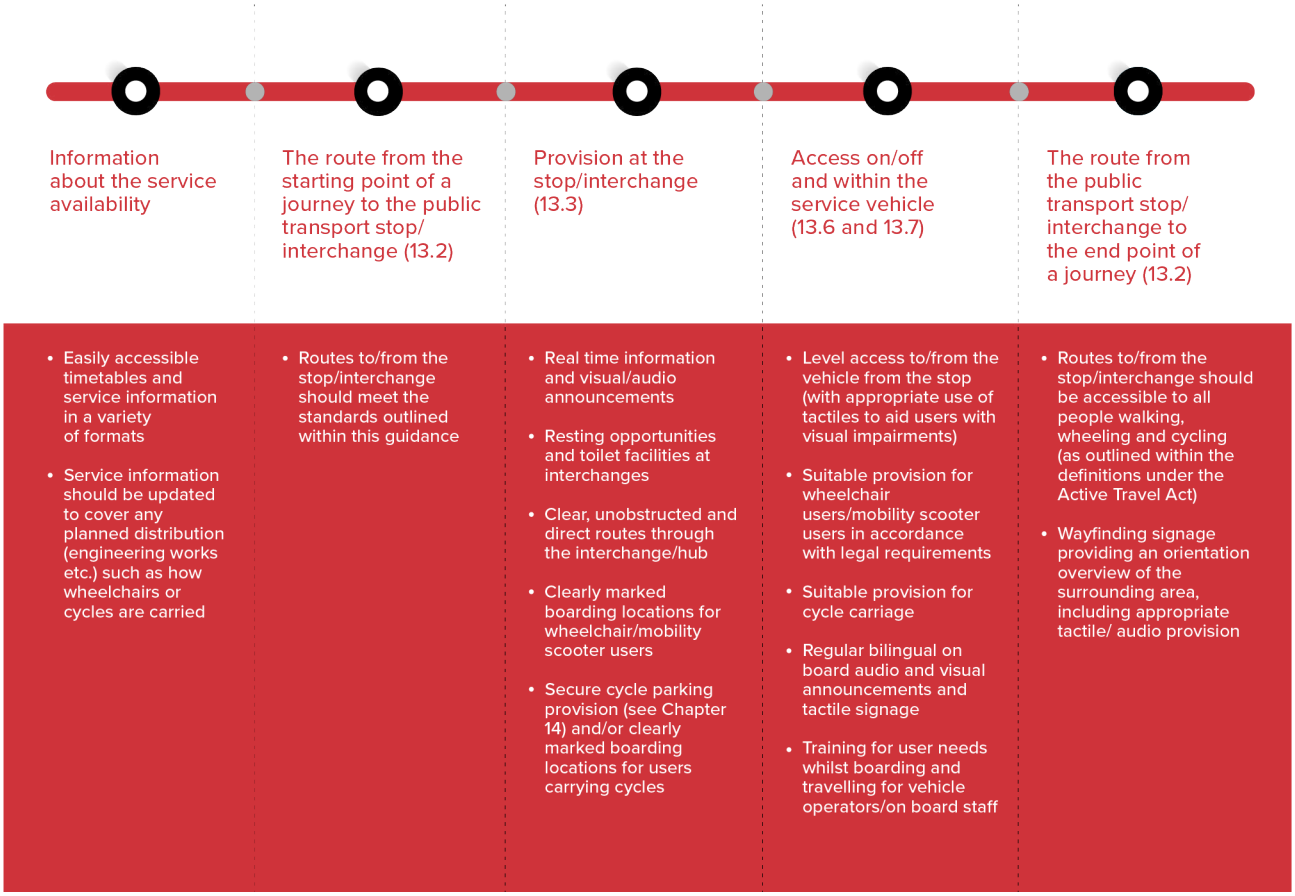
13.1.1 Many journeys are short, and the entire trip could be made by walking, wheeling and/or cycling. Longer journeys can combine public transport with active travel, thus reducing dependency on private car. Walking, wheeling or cycling to/from a public transport stop or interchange provides a reliable journey time and it is often the fastest option for short trips. Transport for Wales is working to develop an integrated, multi-modal transport network across Wales called the T-Network, a joined up network of trains, buses, walking, wheeling and cycling to better support connectivity.

13.1.2 Integrated walking, wheeling and cycling links to/from public transport stops or interchanges – whether rail, bus, tram, taxi or ferry – provide efficient access to and from the interchange, improving the competitive advantage of active and public modes of transport. Integration therefore offers a beneficial effect of encouraging walking, wheeling and cycling, increasing patronage (and thus viability) of public transport and potentially reducing local and longer-distance motor traffic.

13.1.3 Active travel already accounts for a significant proportion of journeys to public transport stops, although there is scope to increase the share of both modes. Compared with walking and wheeling, cycling significantly increases the catchment area (further still with the use of an e-cycle) (see table 4.1). Improving cycle access to interchanges is therefore a major opportunity to generate new trips or shift trips from car to sustainable modes.

13.1.4 In order for a multi-modal journey to be accessible to all via a combination of active and public transport modes, the entire door-to-door journey needs to be considered. The following table outlines these considerations; paragraph numbers are provided to show where the points are covered in further detail within this chapter.

Figure 13.1: Multi modal active travel journey considerations



13.2 Active travel to and from interchanges and public transport stops

13.2.1 Walking, wheeling and cycling to stops, stations and interchanges require high quality routes that are coherent, direct, safe, attractive and comfortable. Pedestrian routes should offer direct access from the surrounding area, with cycle routes to settlements/trip attractors that are further afield. Public transport interchanges should be a high priority destination when planning the active travel network.

13.2.2 Interchanges are often busy environments. It is important therefore to provide safe and direct access for users of active modes between services and other nearby facilities.

13.2.3 All bus stops should feel safe and comfortable for everyone, at all times of the day. Stops for local services should be considered carefully so that they can be easily accessed by people walking or wheeling. Their precise location will depend on a range of issues, such as the need to avoid noise nuisance, visibility and other road safety requirements, and the convenience of people passing by whether walking, wheeling or cycling.

13.2.4 The design of the space around bus stops should be considered as active travel routes are developed so that any potential conflict between users is minimised. Engagement with relevant stakeholders is recommended during the design stage (see chapter 5). Further information on the design of cycle lanes/tracks at bus stops is included in chapter 11.

13.2.5 Footways may require local widening to accommodate waiting passengers while still allowing for people walking or wheeling along the footway. Stops along main routes that are well connected with cycle infrastructure may benefit from dedicated cycle parking (see chapter 14). Where stops form part of cycle routes, shelters, should be see through and should be carefully planned so as to not restrict visibility of users likely to be stepping in front of/behind the stop. Recent examples of bus stops implemented in Wales have also incorporated greening elements. Further details of suitable bus stop infrastructure options can be found in chapter 11.

Figure 13.2: Green roof on bus stop



13.2.6 Where a new development is planned or when existing street layouts change, the opportunity should be taken to relocate public transport stops, or add new ones, aiming to reduce walking, wheeling and cycling distances and ensure the stops are optimally located for local trip attractors.

13.2.7 The siting of new or relocated station/interchanges are reliant on a number of factors related to the railway network (such as train service patterns and track constraints) and the case for a new station (for example propensity for use and feasibility of build). Further information regarding the proposals for relocated or new stations/interchanges, and the associated processes, can be obtained by contacting Transport for Wales. New or relocated stations are required to undergo a process known as the Project Acceleration in a Controlled Environment (PACE), which outlines eight distinct stages of scheme development from scheme initiation to entry into service (see Network Rail station design guidance manual).

13.2.8 Walking, wheeling and cycling access to/from and within the station should be considered throughout these stages and the local authority should be involved in the development process from an early stage to plan routes accordingly in line with the duties of Active Travel Act. Routes to/from the proposed station from key trip attractors should aim to meet the active travel route standards outlined within this guidance before the station becomes operational.

13.2.9 Under the Learner Travel Measure (Wales) 2008, local authorities are required to provide public transport to/from pupil's nearest school within a specified distance (outlined within the measure). This can often lead to lengthy and indirect routes for home-to-school transport. Provision of suitable active travel routes from home addresses to a nearby 'hub' pickup location can provide an opportunity to improve overall school bus service times and potentially reduce revenue costs for service operation. Mapping postcode data onto GIS systems can provide a quick way to establish where such hubs might be best placed.

13.2.10 Demand Responsive Transport (DRT) is currently in place in various local authority areas across Wales, for example via the Fflecsi services. Suitable walking, wheeling and cycling links to and from the boundaries of the operating areas could significantly increase the reach, and therefore patronage and viability, of such services.

Figure 13.3: Demand responsive transport service



13.3 Active travel at interchanges and public transport stops

13.3.1 Interchanges between multiple forms of transport are important destinations in their own right. Key features that should be located at transport interchanges include:

- fully accessible with step free and clearly signed facilities for all users.
- provision of seats and shelters.
- passenger lifts should be capable of accommodating mobility aids and full size cycles, including those adapted for use by disabled people, and where these are single direction entrances, enough space to turn around.
- left luggage, toilets and shops will make the prospect of waiting more comfortable and attractive.

13.3.2 Some people rely on assistance dogs to be able to travel independently using public transport, spending sometimes long hours on a train or a bus. Many of these dogs are trained to only use grass for toileting, which makes it important to consider the provision of assistance animal relief areas at transport interchanges and stops with dog bins nearby. These journeys may use a combination of different transportation modes, so it is important to provide these areas by the interchanges so the animals can use them in between different parts of the journey.

13.3.3 A code of practice (Design Standards for Accessible Railway Stations) applies to all passenger train and station operators in Great Britain.

13.3.4 Transport for Wales also has its own Station Design Toolkit and any provision of facilities at new or upgraded stations should adhere to the standards contained within the toolkit. Further information on the contents of the Station Toolkit is available from Transport for Wales.

Figure 13.4: Transport for Wales train serving a station



Cycle parking at interchanges/stops

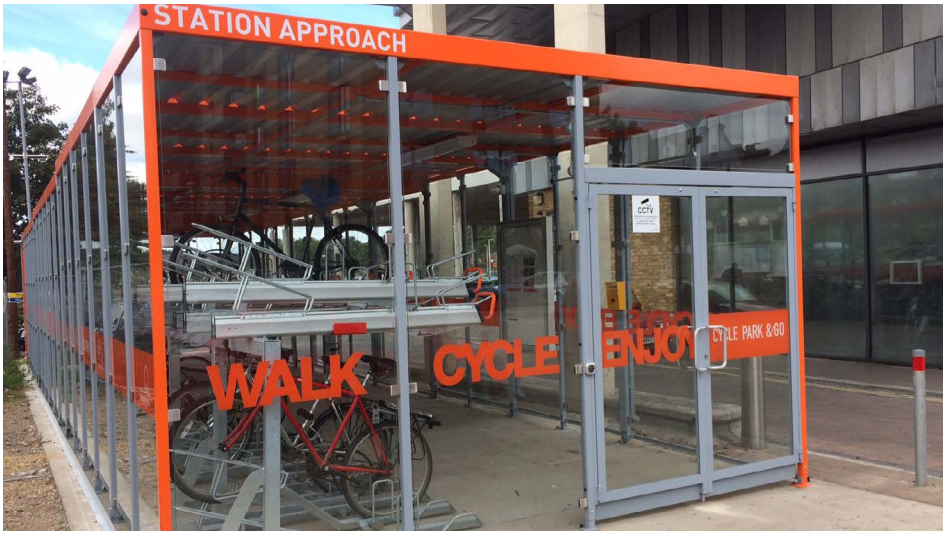
13.3.5 Providing adequate space for cycle parking at bus, rail or ferry terminals is vital and should be given a high priority by local authorities, working in partnership with the relevant operators and organisations managing the facilities. Local authorities are encouraged to engage with Transport for Wales at the earliest opportunity in relation to provision of cycle parking at bus and rail stops, interchanges and stations.

13.3.6 Provision to store cycles securely at a stop/interchange should meet the needs of a range of different users, including those employed at the interchange, short term visitors, as well as long-stay parking for people cycling to or from the stop/interchange to board/alight another mode of transport. This may require a combination of provision throughout the interchange for different types of users (for example secure cycle parking both on the platform for long-stay users and outside the main entrance for short-term users).

13.3.7 The nature of public transport trips and the direction of travel should be considered. Outlying stops and stations that serve daily commuters travelling by bus or train to town or city centres are likely to have a demand for daytime parking. Town centre terminus or interchanges may attract more overnight parking as cycles are used for the last-mile to/from the workplace. For commuter stations in particular, demand for cycle parking should be provided based on the future anticipated cycle mode share. Estimated daily passenger numbers for every UK station are available from the Office of Rail and Road (ORR) which can help indicate local demand and potential.

13.3.8 Secure cycle parking can also be provided in small quantities at suburban and rural bus stops, which will greatly increase their catchment area. Secure cycle parking can be provided at interchanges with good lighting, CCTV coverage, and the provision of specific equipment such as lockers, or secure entry cycle storage compounds.

Figure 13.5: Cycle Parking – cycle hub with secure fob entry system



13.3.9 At busier stations, secure cycle parking facilities with hire, repair, charging and retail facilities may be encouraged by local authorities working in partnership with commercial or voluntary organisations and rail operators. They may require subsidy, however, at least during the early stages of operation. The hub locations might also serve other purposes such as ticket sales, cycle freight consolidation, coffee shops and/or co-working/meeting spaces. Again, early engagement with Transport for Wales is encouraged.

13.3.10 To support a continued modal shift to active modes, where improvement works are scheduled to interchanges/hubs, any effect on storage facilities should be considered and mitigated, for example, by provision of temporary alternatives if required.

13.3.11 Further details on recommended cycle parking options are described within chapter 14.

13.4 Park and cycle

13.4.1 Park and cycle works in the same way as other park and ride sites (and may be colocated) but cycles take the place of the bus or rail journey stage. Users travel to the park and cycle area by car and park their vehicle, hire a cycle from a secure locker and cycle the rest of the way to their destination. Equipment such as clothing and helmets can be stored in the lockers. To maximise viability the pricing strategy has to allow for payment for parking, in addition to a fare on any associated bus or train service.

13.5 Carriage of cycles on public transport

13.5.1 There are significant benefits for both users and operators in enabling public transport vehicles to accept cycles, and local authorities should encourage public transport operators to do so where feasible.

13.5.2 Some disabled people use cycles as mobility aids, and may need to take their cycle with them on the journey, or require cycle parking to be at the platform level so it is as close as possible to where they board the train. Operators are required to make reasonable provisions in either of these cases.

13.5.3 Some train operators provide flexible spaces on trains where the space can be available the carriage of cycles. Clear signage should indicate the priority usage for these flexible spaces.

13.5.4 Cycle carrying provision on trains varies depending on the operating company and type of train being used on the route, with some operators requiring reservations, restrictions at certain times of day for non-folding cycles and varying arrangements for storage of the cycles once on the train. It is recommended wherever possible that train operating companies permit the carriage of cycles and consider the needs of users with cycles (including adapted cycles and e-cycles) at the early design stages for the layout of new, or updates to existing, rolling stock. Further information regarding carriage of cycles on trains can be obtained from Transport for Wales or The Rail Delivery Group.

13.6 Carriage of cycles on buses

13.6.1 Carriage of non-folding cycles on buses is less common in the UK, though successful examples do exist, for example, in the Scottish Borders and Lake District. Examples of carriage options may include accompanying trailer, or dedicated spaces for cycle storage within the vehicle.

13.6.2 Cycle racks directly attached to the front or rear of the passenger service vehicle are not recommended within the UK due to driver visibility and pedestrian safety implications (to the front) and security/visibility concerns for users loading/unloading to the rear.

Figure 13.6: Cycle storage on a bus



13.6.3 Even if cycle carriage is prohibited during the crowded peak hours it should be permitted at other times. Public transport vehicles will typically be operating at peak loading for less than a quarter of the time. More efficient use of the vehicles can be obtained by encouraging a wider range of users in the off-peak, including those who wish to carry cycles with them.

13.6.4 Dwell times of public transport vehicles are usually little affected by cycle carriage, but clear signs and announcements at interchanges and on the vehicles (see figure 13.7) will help users to know where to board with their cycles, avoiding inconvenience to other passengers and delay to services.

13.6.5 Where scheduled modes of travel are disrupted, for example, by planned engineering works, replacement provision should be provided for users who would normally be permitted to travel with equipment, for example, carriage of cycles on road vehicles replacing train services. Any advance notice of planned disruption should make the alternative provisions clear at the earliest opportunity during the period of disruption. Policies on replacement services vary between train operators, and further details can be obtained from Transport for Wales, staffed ticket offices and the National Rail website.

Figure 13.7: Train carriage with cycle storage clearly marked



Figure 13.8: Train carriage cycle storage



13.7 Cycle hire schemes

Area-wide cycle hire schemes

13.7.1 Cycle hire can take one of several forms. Area-wide cycle hire networks generally either use fixed locations to park cycles, which could be in the form of physical docking stations or virtual docking bays, or use a dockless system which provides a more free-floating arrangement for users. Examples of these types of operations in Wales include schemes in Swansea and Pembrokeshire. Other examples of cycle hire provision, particularly for rental of folding cycles, include Brompton docks, where users retrieve the bicycle from a high security locker. Another different model is where a business or social enterprise hires out cycles from a hub location during business hours.

13.7.2 Further information on cycle hire opportunities is available from CoMoUK or via Transport for Wales.

13.7.3 Potential users may wish to travel to destinations beyond the boundaries of the local authority area, where neighbouring local authorities are looking to implement hire systems, a partnership approach is therefore recommended.

13.7.4 E-cycles are now starting to be included as part of public cycle hire schemes which may be ideal for some towns in Wales where there are significant hills and services are dispersed over greater distances.

Cycle hire at public transport interchanges, Brompton locker

13.7.5 Cycle hire provision at major hubs/interchanges, and in locations where tourism potential is greatest, can help to reduce onward private motor travel and support local accessibility. In considering cycle hire opportunities at public transport interchanges, you should engage with Transport for Wales at the earliest opportunity.

Figure 13.9: Cycle hire scheme




Train Statio

Chapter 14: Related facilities

This chapter provides guidance on the provision and design of important features to support active travel including signage and wayfinding, public toilets, washing facilities, cycle parking and facilities. It builds on **chapter 8** which provided guidance on seating, play on the way and integration of trees and green infrastructure.

The chapter relates to section 2(9) of the **Active Travel Act**. In determining whether anything constitutes related facilities for the purpose of the Act a local authority must have regard to this guidance.

Key areas for consideration include:

- options and specifications for the various active travel related facilities.
- how the provision of related facilities enhance the amenity value.
- local authorities must consult DfT's '**Inclusive Mobility**' when drawing up specifications for related facilities to ensure they are appropriate for all users.
- further information regarding signage and how detailed specifications can be sought from the **Traffic Signs Manual**.

14.1 Introduction

14.1.1 Section 2(8) of the Active Travel Act defines a range of features as related facilities for the purposes of the Act including:

- facilities for shelter, resting or storage.
- toilets or washing facilities.
- signage.
- other facilities, which are available for use by, or by any description of, people walking, wheeling, and cycling when using an active travel route.

14.1.2 Related facilities must be included on the ATNMs and be added to the maps using DataMapWales. There are a number of existing related facilities on the maps and these should be audited and updated regularly as required so the information is kept up to date.

14.1.3 Related facilities can contribute to making routes attractive, comfortable and coherent for users of active modes by the provision of items mentioned in section 14.1.1. Further details on placemaking, including on provision of seating is covered in chapter 8.

Figure 14.1: Planters and cycle parking, Abergavenny



14.1.4 Facilities should be inclusive and accessible so they can be used by everyone at all times of the day and night. Level access, lighting, passive surveillance, sufficient widths (see chapter 9) and heights, are fundamental for all people being able to and feeling comfortable using the facilities. It is important that the placement of structures and street furniture does not restrict access for users or create places where people might be able to hide.

14.2 Public toilets

14.2.1 A lack of clean, accessible and safe toilets impacts everybody, but can disproportionately affect the most vulnerable of users. Older people, parents and carers with young children, disabled people and people with chronic health problems all need easy access to suitably equipped public toilet facilities. Some people may feel unable or reluctant to leave their homes and visit areas where they fear they will not be able to find, or easily access, a public toilet.

14.2.2 Public toilets in town centres, parks and promenades help to encourage people who may need regular toilet access to take exercise and stay physically active. However, public toilets that are badly designed, badly maintained, and poorly located generate a sense of neglect.

14.2.3 Toilets should be no less available for disabled people than for non-disabled people. It is recommended that disabled toilets should be designated as unisex, not integrated with male and female toilets. The provision of unisex toilets allows use by disabled people accompanied by a carer or partner of the opposite sex. Facilities should include changing places that are equipped with benches and hoists to enable carers to assist severely disabled people.

14.2.4 Further guidance regarding toilet design and minimum specifications can be found in Inclusive Mobility and BS8300. Facilities may be provided in partnership with private sector businesses or public transport operators (but this will usually limit hours of opening). See Changing Places.

14.2.5 Cycle parking provision designed for short stay activity should be provided close to the entrance of public toilet facilities (see section 14.8 for further detail).

14.3 Washing and changing facilities

14.3.1 Washing and changing facilities are also helpful in enabling active travel, for example, the provision of showers at a longer-stay destinations, such as further education institutions and workplaces.

14.3.2 In many instances, it may not be possible to retrofit such facilities into destination buildings. In these cases, an area wide approach could provide a more deliverable solution, particularly for areas with high density of long-stay trip attractors. This can be combined with other facilities, such as secure cycle parking to create a cycle hub that either has commercial opportunities or is a cost effective option for a cluster of buildings to fund together. See section 14.7.23 for further information about commercial cycle parking hubs.

Equipment storage

14.3.3 Appropriate storage facilities for clothing, helmets and comfortable shoes can also help in enabling utility journeys. This is most useful in long-stay destinations, such as workplaces.

14.3.4 Publicly available storage facilities, such as left luggage can indirectly help enable use of active modes for utility journeys by removing the need to carry around heavy equipment/ suitcases. Some users may risk having items stolen because it is too inconvenient to carry around with them at their destination.

14.4 Litter bins

14.4.1 Litter is a major concern for many people. Keep Wales Tidy undertakes an annual survey of local environmental quality across Wales. In 2023-2024 of the 3,161 streets surveyed over a quarter were littered with fast food packaging and 1 in 10 had disposable vapes.

14.4.2 Litter bins should be clearly identifiable and located where they are likely to be the most used. For example, a litter bin placed outside the entrance to a fast-food shop may be less effective than one placed 200 metres away where the food and packaging litter tend to be deposited.

14.4.3 Litter bins should offer sufficient capacity for the location. Local authorities and private owners responsible for their maintenance should ensure they are emptied frequently. Compactor bins, whilst more expensive to install, can reduce the frequency required for emptying. Materials choice needs to consider local conditions and ideally match the design themes of other street furniture. Plastic bins can suffer vandalism in some locations while metal bins corrode quickly in saline environments. Open topped bins are prone to having litter escape from them whilst closed top bins should be regularly cleaned to encourage usage.

14.4.4 Inclusive Mobility and BS8300 provide further guidance on the position, design, and height of bins in streets and other public areas.

14.5 Count displays

14.5.1 Automatic counters with a display panel can be installed alongside routes to help to promote a route and encourage users (as well as monitoring overall route usage – see chapter 16). The displays typically show the number of daily, weekly and cumulative total users per annum.

Figure 14.2: Electronic cycle counter adjacent to cycle track



14.6 Signage and wayfinding

14.6.1 Signage is important for users of active modes for navigation as well as highlighting and promoting the presence of routes for other users. Well placed and clear bilingual signage will help users to find their way around an unfamiliar area or identify more direct routes between destinations. Signs should complement the surrounding environment and be planned at the route or network scale to ensure consistency.

14.6.2 Signage strategies should consider the following key principles:

- **minimising signing** – improve the clarity and safety of a route through improved design rather than extra signs.
- **minimising clutter** – the use of signs which minimise street clutter through appropriate sizing, good location and integration with existing street furniture.
- **sign coherence** – the importance of coherent and consistent signage over a whole network and along a particular route, including connections to and from adjacent destinations.
- **maintenance** – using good quality materials minimises the need and cost of future maintenance. This is particularly relevant for sign fixings, some of which can loosen and therefore require regular maintenance.
- **user value** – good signage will enable users to locate themselves and the intended destination through use of strategic and local destination directions to include key facilities.

14.6.3 Street name plates help with navigation and should be provided in a consistent style in each local authority area, mounted at or below 2.5m where practical. The plates should be provided at both ends of every street, except culs-de-sac, unless the cul-de-sac extends onto a route for people walking, wheeling, and cycling, in which case appropriate plates should be provided to show through access as these short cuts can be very advantageous for users. On long streets where people are likely to join the street mid-way, street name plates provided at junctions with significant side roads can be very helpful for orientation, even more so if building numbers are included on these signs. On wide streets name plates on both sides is desirable.

Figure 14.3: No through road with except cycles plate and directional signage (Except should be bilingual)



14.6.4 Signed active travel routes should always be as direct as possible but should avoid unsafe or poor quality infrastructure if this cannot be modified.

14.6.5 Care should be taken with the design of sign assemblies to reduce the risk of vandalism and sign rotation. Where fingerpost arrangements are proposed, purpose-built products are available which provide aesthetically pleasing non-rotatable signs. It is also important to ensure signs are located where they will be visible and not obscured by other signs or vegetation growth.

14.6.6 People walking, wheeling, and cycling have different wayfinding needs and signage is often best separated between the modes rather than combined. Specific advice for signage appropriate to each mode is provided below.

Mounting heights and positions

14.6.7 Where signs are erected above footways and cycle tracks, adequate clearance is required for people walking, wheeling, and cycling. A minimum height of 2300mm for pedestrian routes and 2400mm for cycle routes is recommended – see chapter 1 of the Traffic Signs Manual. Signs on bollards are typically mounted at least 800mm high to ensure they can be easily seen, and signs on walls placed at a height of 1500mm.

14.6.8 Sign posts should be placed at least 500mm from the carriageway and cycle track edge, but no more than 1000mm from the route to ensure that they are visible to users. Where bollards are placed in cycle tracks a clear width of 1500mm is required for access by the full range of wheelchairs and cycles.

Distance and time units

14.6.9 Distances must be expressed in miles, fractions of miles and yards as set out in The Traffic Signs Regulations and General Directions 2016 (TSRGD). Estimated journey times in minutes may be shown on cycle and pedestrian signs, particularly in dense urban areas or at transport interchanges. This can be a useful prompt for people who are new to the route and for example might hail a taxi if they weren't aware their destination is only a 7 minute walk away. Time and distance must not be shown on the same sign.

14.6.10 An average speed of 10mph provides a baseline for calculating cycle journey times but this needs to be modified to take account of any steep or long hills on a route. Local authorities should check actual journey times when developing a sign schedule. Beyond four to five miles, journey time estimates will become more inaccurate and only distances should be used.

Figure 14.4: Destination/time sign example



Signage to moderate behaviour

14.6.11 As outlined in chapter 9, designers should provide separate space for different modes of active travel, dependent on context (see table 11.1). However, there are many places where this is not practicable or desirable, for example, multi-user trails, promenades, canal and river towpaths and parks. In such areas it is important to remind people to use the area with consideration for others according to the hierarchy of users. Table 14.1 and the case study below highlights some signing options.

Table 14.1: Examples of signage to moderate behaviour

	Figure 14.5: Advisory information sign placing people walking, wheeling and cycling on an equal footing. Use should be limited to key locations off-highway for maximum impact and to reduce sign clutter
	Figure 14.6: Advisory information sign clarifying hierarchy. This sign should not be the default on shared use routes and its use should be limited to key locations off-highway for maximum impact Can also be used either side of a bus stop if required
	Figure 14.7: Advisory sign for a road where people walking, wheeling, cycling and driving should expect to share the same space
	Figure 14.8: Advisory markings to highlight different user groups and promote considerate use

Case study: Bristol and Bath Railway Path – “Left is Best”

Context

The Bristol and Bath Railway Path is a heavily used shared-use route on the National Cycle Network, carrying at least one million trips a year and serving people walking, wheeling, cycling and running. On the busy BS5 section, users reported uncertainty, overtaking issues and conflict between different speeds of travel.

Intervention

Walk Wheel Cycle Trust and Bristol City Council trialled temporary “Left is best” signage through the One Path BS5 project. The message was framed as positive guidance for all users, rather than enforcement. It was developed following engagement with accessibility groups, work with stakeholder groups, community collaborative design workshops, and supporting research on the value of a single shared convention.

Outcomes

The evaluation found that 97% of surveyed users were observed keeping left after the trial signage was introduced. Observed compliance increased among walkers from 95% to 98%, joggers from 94% to 96%, and cyclists from 90% to 97%.

Interaction analysis also found that the proportion of route users involved in any interaction fell from 8% to 4%. Across all modes, no conflicts were recorded where users were required to suddenly manoeuvre or where contact was made.

Perception data was positive: 91% of respondents agreed that the “Left is best” sign was a positive addition to the path, 84% agreed it helped make the path work for everyone, 72% agreed it reduced conflict, and 62% agreed it made them feel safe.

Lessons for application in Wales

This case study suggests that on shared-use routes, simple, consistent and inclusive behavioural guidance can improve user experience even where physical separation is not feasible or appropriate. The approach is particularly relevant where routes must operate as both movement corridors and local social spaces, and where inclusive use depends as much on confidence and comfort as on physical dimensions alone.

For Welsh application, the main transferable lesson is that behaviour-change measures are likely to be most effective when they are co-designed with local users, framed positively, and supported by monitoring before and after implementation. Bristol and Bath path shows that low-cost signage, if evidence-led and embedded within a broader programme of path improvement, can help make shared routes feel calmer, safer and more legible for a wide range of users.

Figure 14.9: 'Left is Best' signage



14.6.12 Signage can also be used to moderate other road users behaviour to on-highway active travellers and leisure cyclists as shown in figure 14.10 and figure 14.11 below. This 'close pass' awareness sign was erected in Gwynedd and Conwy counties as part of a trial and can be used throughout Wales subject to agreement by the Welsh Government.

Figure 14.10: Advisory close pass sign



Figure 14.11: Sign plate for close pass sign



Specific signage for people walking and wheeling

14.6.13 Signing should be clear and give people walking and wheeling who may not be familiar with the local area some indication of distance and/or time to local facilities. The ATNM review process includes a review of local facilities served by active travel routes and this should form the basis of a signage strategy.

14.6.14 Excessive signage contributes to the accumulation of street clutter. Most people will be aware of facilities close to their own home, but signs can be particularly useful where:

- people may not be aware of more direct walking and wheeling routes away from the highway, leading them to use the car instead.
- there are likely to be tourists or other visitors unfamiliar with a location such as town and city centres, hospitals, educational, historic and cultural attractions.

14.6.15 Way finding aids, such as the on-street maps (see figures 14.12) are good examples of signs which fit well within the existing street environment. In developing wayfinding systems, designers should consider different user profiles, journey types, start and end destinations and based on this provide information that is most pertinent – for example typical journey times to key destinations by walking, wheeling and cycling. They are provided at points of arrival, such as outside public transport interchanges, and where routes converge in the city centres. Bilingual destination text is provided alongside pictorial graphics of the destination, for example a book to accompany the library text – this is potentially useful for those who cannot read English or Welsh. Positioning of such features must not impede clearance widths along active travel routes.

Figure 14.12: Wayfinding scheme map, Swansea



Figure 14.13: Wayfinding scheme signpost



14.6.16 In Wales, over 121,000 people are living with sight loss (see RNIB Wales). Tactile versions of maps combined with audible information can be useful to those with sight loss and are increasingly provided through mobile and on-line media, though it should not be assumed that these provide an acceptable replacement for well designed built environment interventions. Where appropriate, on-street signage should be accompanied with tactile embossed and/or braille markings.

14.6.17 Special paving slabs or plaques can be used to identify marked walking and wheeling routes. Current examples in Wales mainly exist on longer-distance trails. Pavement markings and insets will only be useful to partially sighted people with sufficient residual vision. Generally the signs do not have enough distinctive texture or contrast to be identified underfoot or by blind people using a cane.

14.6.18 Further guidance regarding accessible signing can be found in 'Sign Design Guide, a guide to inclusive signing', published by the Sign Design Society.

Specific signage for people cycling

14.6.19 Most cycle signs are placed in the highway and therefore subject to the Traffic Signs Regulations and General Directions (TSRGD) and accompanying volumes of the Traffic Signs Manual. Further information on signs for walking, wheeling, and cycling are included in TSRGD with further Welsh guidance, and designers should always check the latest editions of TSRGD. The advice here complements that guidance by expanding on some signing issues, particularly to the design of cycle infrastructure.

14.6.20 Road signs and markings fall into three categories:

- **regulatory** – enforceable traffic management.
- **warning and advisory** – traffic management and markings that warn of hazards and to guide positioning.
- **route guidance** – location and direction signs.

14.6.21 Signage for cycling may combine more than one of these functions. In Wales all signs with text must be bilingual with the Welsh language positioned so that it is read first. Examples of all approved highway signs can be found in the Welsh Government website.

14.6.22 There are some cycling-specific signs and markings in each of the above categories. Cycle specific signing is useful to:

- make people driving aware of cycle lanes and assist enforcement.
- encourage lane discipline and safe positioning by people driving and cycling.
- warn other road users of the likely presence of people cycling, particularly at crossings and junctions.
- make people aware of rights of way where cycling is permitted or prohibited.
- enable users to follow recommended cycle routes.
- promote cycling and raise its status.

14.6.23 For non-prescribed signs (signs not included in TSRGD), authorisation is required. In Wales this authorisation is given by the Welsh Ministers.

14.6.24 Many signs are optional rather than mandatory. The majority of on-street cycle routes can be adequately catered for within the general traffic signing regime and by exemption to restrictions. It is useful to bear this in mind, as cycle infrastructure can be quite sign intensive and, if not carefully designed, can create unnecessary visual intrusion. Where appropriate, signs should be mounted on walls, existing posts or other street furniture to minimise the number of sign posts on the footway.

Route guidance, location, and direction signage

14.6.25 Route, location and direction signs create a usable network for cycling. It communicates to people where it is possible to travel and how much more direct these options can be than the alternative car or public transport journey. They are also essential to direct and reassure people who are not familiar with the area. Not all signing used for cycling needs to be specific – well implemented standard signing such as street names and traffic signs provide a foundation on which to make specific additions.

14.6.26 Cycle routes are usually distinguished by white on blue vertical signing with a cycle symbol. Cycle route signing and route confirmation should only be used where routes are direct and convenient and where the journey experience, under normal conditions, is reasonably good – audit tools in appendix H should be used to establish the journey experience against acceptable levels.

Figure 14.14: Diagram 967 TSGRD Route recommended for pedal cycles on the main carriageway of a road



14.6.27 Along off-highway routes and back streets, general directional signs are unlikely to be present, and so cycle specific signs should address the requirements of direction signing as well as route confirmation. This can be done with signs or with road markings. On main road routes vertical signs should be used for direction signing, with a route symbol either on the sign or combined with lane markings to provide route confirmation.

14.6.28 On long sections of cycle route between junctions, route confirmation signs will let users know that they have not unintentionally left the route. The cycle route sign diagram 967 on its own should not be used for this purpose as the person cycling could be on a different route from that desired. In urban areas repeater signs should be placed every 250 – 300m, or at key decision points (whichever is sooner). In more rural areas where route options are more limited, it may be suitable for repeater signs to be placed further apart (up to a mile).

In addition to marking the route itself, signs may be required to direct people cycling onto the route at intermediate locations. Signs may also be required to direct people cycling to destinations along the route or at the end. A specific locality, such as the local train station, should be used even if the cycle route itself does not go all the way there.

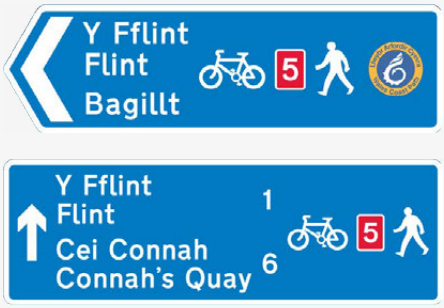
Figure 14.15: Diagram 2601 (TSRGD) – Confirmation sign with arrow



14.6.29 Within each area a consistent set of destinations should be used, these will typically be divided into primary, local and supplementary destinations. Supplementary destinations will be points of potential interest, such as, public toilets, shopping centres, sport centres, railway stations, tourist attractions, names cycle routes (for example, the Taff trail). Examples of these categories are given in table 14.2 and the following should be considered:

- where destinations are listed, closest destinations should be at the top of the sign, with more distant and strategic destinations below.
- distances are given in full miles for any distance greater than 3 miles. Half and quarter fractions are used for distances under 3 miles (for example 1½ or 2¼).

Table 14.2: Examples of primary, local and supplementary signs

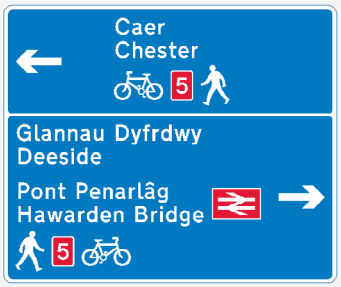
Primary	Local	Supplementary	Examples
Flint	Northop Bagillt Greenfield	Wales Coast Path, Connah's Quay (for example, the Taff Trail).	
Newtown	Trehafren Vaynor Llanllwchaiarn	Named cycle route (Lôn Cambria), College).	
Rhyl	Rhuddlan Dyserth Kinmel Bay	Town centre, railway station.	

14.6.30 Following section above the primary destinations in Wales are outlined in appendix C of LTN 1/94.

14.6.31 Where cross-border routes are proposed, the chapter 2 of Traffic Signs Manual provides an updated list of primary destinations for English settlements.

14.6.32 There are various types of direction signs suitable for people cycling, and the choice depends on location and purpose. The main types are listed below. Note that detailed sign design requires specialist traffic engineer input, reference to the Traffic Signs Manual and normally the use of specialist computer software.

Table 14.3: Example of direction signs

Signage type	Usage/considerations	Example
Finger post	These are used at junctions. The sign itself points in the appropriate direction using a chevron arrow.	
Advance signs	Used prior to the junction to give advance warning and enable initial manoeuvring to take place.	
Stack signs	Useful where there are several different destinations, as a space efficient method to list above each other in tabular form. Can be used either in advance or at a junction.	
Maps	Includes a pictorial representation (map) to clarify the navigation. Signs of this type are of value at complex junctions or where the route to be taken may be unclear, such as left and then immediately right.	

Information signage

14.6.33 Use of the CYCLISTS DISMOUNT sign should be avoided. On a well-designed facility the instruction for people cycling to dismount is very rarely appropriate and represents a discontinuity in the journey, which is highly disruptive. It should only be used in situations where it would be unsafe or impracticable for a person cycling to continue, or at the complete termination of a route, for example at a railway station forecourt. Even at these locations it should be borne in mind that some people who use their cycle as mobility aid will be unable to dismount.

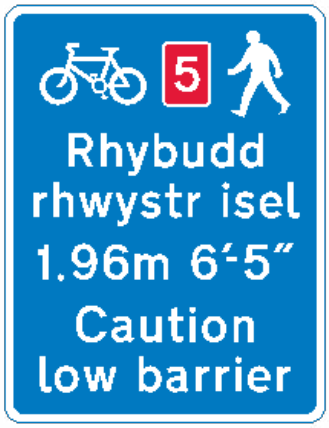
There will seldom be justification for using a CYCLISTS DISMOUNT sign where a cycle route crosses or joins a carriageway. The alternative permitted variant 'CYCLISTS REJOIN CARRIAGEWAY' may be more appropriate (see figure 14.16).

Figure 14.16: A positive instruction should be used where a sign is necessary to indicate the end of a route



14.6.34 Designers should design or modify schemes to ensure that its use of the CYCLIST DISMOUNT sign is avoided. Where these signs already exist it is recommended that authorities review locations and consider alternative provision to enable people cycling to proceed without dismounting, such as the use of the 'CYCLISTS REJOIN CARRIAGEWAY'. Where the sign's use appears unavoidable, designers should be able to defend their decision as to why it cannot be avoided.

Figure 14.17: Advisory information should be used where a sign is necessary to indicate a restriction such as low headroom



14.6.35 The END OF ROUTE sign to TSRGD diagram 965, and the END marking to TSRGD diagram 1058, are not mandatory, and should be used sparingly. As with CYCLISTS REJOIN CARRIAGEWAY, where their use appears unavoidable, designers should explain their decision of why it cannot be avoided in the Design Decision Log (see appendix L). When deciding whether to use them, consideration should be given to the purpose they are meant to serve. If the end of the route is obvious, they are redundant. If the cycle route cedes priority on ending, GIVE WAY signing should be used instead.

14.7 Cycle parking

14.7.1 Good quality secure cycle parking helps encourage cycling and can be provided quickly without significant change to other infrastructure or a lengthy approvals process. Secure cycle parking at either end of a trip has a significant influence on cycle use. The risk (or direct experience) of cycle theft and vandalism will undermine investment made to the cycle network by deterring people from cycling.

14.7.2 A key principle of making cycling an attractive mode of transport compared to the private car is competitive advantage. Well located cycle parking conveniently close to the destination or interchange plays a significant role in minimising journey times. A simple test is that the walking and wheeling distance to the destination or interchange from the cycle parking should be closer and more convenient than from car parking provision.

14.7.3 As with active travel routes, cycle parking should be:

- **safe** – secure for the cycle and users should feel safe from the risk of personal crime at all times of the day.
- **direct** – near to the cycle route and/or adjacent to the final destination.
- **coherent** – well-connected to routes and buildings, well-signed and easy to find.
- **attractive** – of good quality design and well-maintained.
- **comfortable** – easy to use and accessible to all.

Figure 14.18: Example of cycle parking well integrated with space, Swansea



14.7.4 The design should also be inclusive with proper consideration of the variety of needs of potential users. Leaving a larger gap at the end of a row of Sheffield stands and offsetting further from the wall will allow larger bikes and trikes to make use. Appropriate signs should be installed to designate these spaces in areas where there are likely to be accessible people cycling needing to be parked. Seating close to the cycle parking can be helpful as designers should provide frequently need to adjust luggage and store away bike lights just after they have locked their bike, so benches provide a useful resting place.

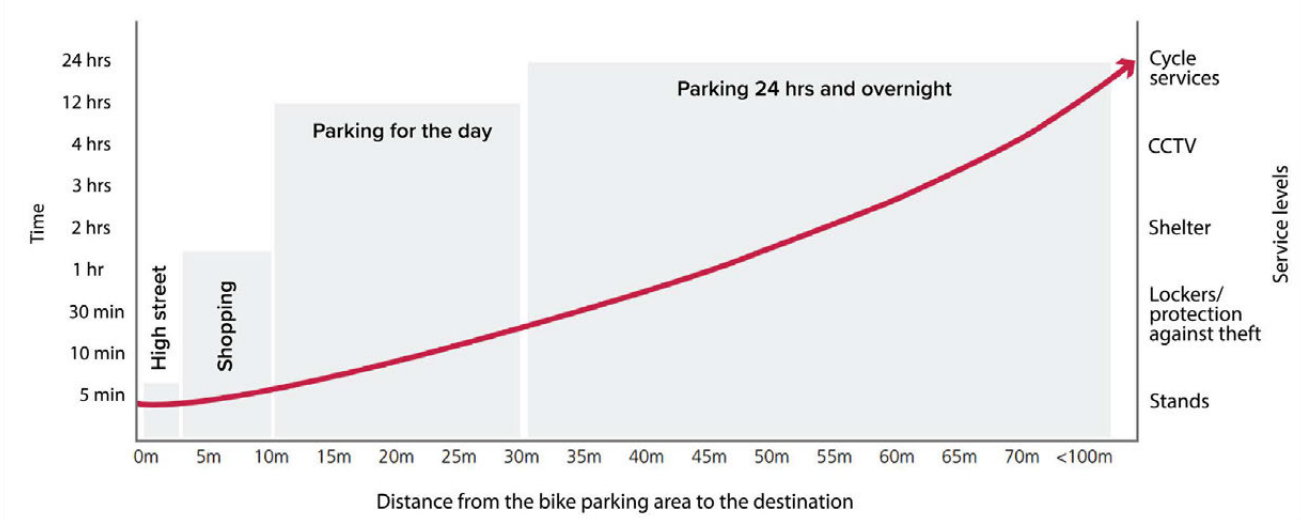
14.7.5 The appropriate quantity and type of cycle parking differs between locations, though parking should be provided at the following types of destination:

- places of residence.
- interchanges with other modes of transport.
- short stay destinations such as shops, cafés and public toilets.
- long stay destinations such as workplaces and educational establishments.

14.7.6 People cycling generally want to park as close to their destination as possible, and short-stay cycle parking should normally be sited very near to the final destination or main entrance to buildings. Where this is not the case, people are likely to 'fly park' (cycles parked in locations that are not within the designated parking areas) such as locking a cycle to railings and lamp columns. However when leaving their bike for longer periods people will trade some convenience for the enhanced security of a locked or staffed enclosure.

14.7.7 Figure 14.19 gives guidance on the relationship between proximity, security, duration of stay, shelter and additional services that might be appropriate for each setting. In locations where there may be multiple types of user (for example, a train station with a mix of long distance travellers and local commuters) it may be suitable to provide a number of cycle parking options.

Figure 14.19: Relationship between cycle parking type and security facilities



Quantity

14.7.8 There should be adequate cycle parking to meet demand including spare capacity to allow for growth in cycling. The quantity will be dependent on the location and nature of provision. Where cycle parking already exists, regular counts of parked cycles will give an indication of any excess demand or current spare capacity. Counts should be undertaken in good weather at a range of times during the day.

14.7.9 Addressing where there is fly parking is a good start to a cycle parking strategy. Where 'fly parked' cycles are found, this will give an indication that the existing parking provision is:

- insufficient to meet demand.
- not secure enough to provide confidence to users.
- too far from the entrance to the destination.

14.7.10 It is good practice for local authorities to provide local planning guidance on cycle parking requirements for new developments. Table 14.4 suggests appropriate minimum cycle parking levels for typical land uses.

Table 14.4: Cycle parking quantities for new development

Land use type	Sub category	Short stay requirement (obvious, easily accessed and close to destination)	Long stay requirement (secure and ideally covered)
All	Parking for adapted cycles for disabled people.	• 1 space minimum. • 10% (up to 50 spaces). • 5% of total capacity (over 50 spaces). • Co-located with disabled car parking.	• 1 space minimum. • 10% (up to 50 spaces). • 5% of total capacity (over 50 spaces). • Co-located with disabled car parking.
Retail	Small (less than 200m^2).	1 per 100m^2.	1 per 100m^2.
	Medium (200-1,000m^2).	1 per 200m^2.	1 per 200m^2.
	More than 1,000m^2.	1 per 250m^2.	1 per 500m^2.
Employment	Office/finance (A2/B1).	1 per 1,000m^2.	1 per 200m^2.
	Industrial/ warehousing (B2/B8).	1 per 1,000m^2.	1 per 500m^2.

Land use type	Sub category	Short stay requirement (obvious, easily accessed and close to destination)	Long stay requirement (secure and ideally covered)
Leisure and institutions	Leisure centres, assembly halls and hospitals.	Greatest of 1 per 50m^2 or 1 per 30 seats/capacity.	1 per 5 employees.
	Educational institutions.	Blank cell.	Separate provision for staff and students. Based on travel plan mode share targets, minimum: • Staff: 1 per 20 staff. • Students: 1 per 10 students.
Residential	All except sheltered/ elderly housing or nursing homes.	Blank cell.	1 per bedroom.
	Sheltered/elderly housing/nursing homes.	0.05 per residential unit.	0.05 per bedroom.
Public transport interchange	Standard stop.	Upon own merit.	Blank cell.
	Major interchange.	1 per 200 daily users.	Blank cell.

14.7.11 Where current occupancy is close to the capacity of available spaces, it is likely that there is suppressed demand. Capacity should be increased by at least 20%.

Cycle parking options

14.7.12 Different types of cycle parking offer different characteristics in terms of their ease of use, weather protection, security and space requirements. Table 14.5 sets out a range of cycle parking types and gives guidance on where these might be appropriate. In general, well designed simple cycle parking design (such as the Sheffield Stand) will allow both the frame and wheels to be secured, and can be arranged to accommodate non-standard cycles (specifically adapted stands should be clearly marked to prioritise users of adapted cycles who may not be able to use the standard layout, alongside adequate provision of standard design facilities).

14.7.13 Locating cycle parking correctly so that users can securely lock both frame and wheels to the parking stand is an important factor in deterring theft. Outer stands should have a tapping rail.

Table 14.5: Range of cycle parking equipment types

Type	Retail on-street	Retail off-street	Employment	Leisure, schools	Residential	Public transport stops/ station	Notes
Sheffield stand	Yes	Yes	Yes	Yes	Yes	Yes	Flexible solution provides secure locking for a variety of cycles. Reasonably priced and available in a variety of finishes, multiple formats and shape variations. Well spaced stands allow two cycles to be parked at each stand. May be combined with baseplates to form a “toast-rack”.
Street stands	Yes	Yes	No	No	No	No	More compact but less stable/ locking points than a Sheffield stand. Suit a variety of cycle types.
Vertical stand	No	No	Yes	No	Yes	No	Compact space requirement but often requires user to lift cycle. May be incompatible with certain cycle types. Requires secure locking point.
Two-tier stand	No	Yes	Yes	No	Yes	Yes	Suitable to locations where very high levels of cycle parking are required in confined spaces. Some users may find lifting cycle to upper tier difficult.

Type	Retail on-street	Retail off-street	Employment	Leisure, schools	Residential	Public transport stops/ station	Notes
Locker/ cages	No	No	Yes	Yes	Yes	Yes	High security but time-consuming to use and with high-space requirement. Best suited to longstay parking. Likely to require maintenance.
Wheel stands	Yes	Yes	No	Yes	No	No	Compact footprint but should include facility to stabilise and lock the cycle frame to the stand. Can be incompatible with some cycles/wheels. Stands that support cycles only by the wheel can cause damage to cycles and should be avoided.
Wall fittings	Yes	Yes	No	Yes	No	No	More compact but less stable/locking points than a Sheffield stand. Suit a variety of cycle types.
Street furniture	Yes	Yes	No	No	No	No	Compact space requirement but often requires user to lift cycle. May be incompatible with certain cycle types. Requires secure locking point.

Cycle parking layout

14.7.14 The following factors should be considered when locating cycle parking:

- **security** – cycle parking should allow users to secure their cycle with a variety of lock types.
- **lighting** – essential for personal security and for parking after dark.
- **weather protection** – careful consideration of surroundings can provide beneficial coverage, for example roof overhangs, rather than having to install specific shelters Dry cycle storage is important for commuters and overnight parking.
- **obstruction** – parked cycles should not obstruct routes used by people walking and wheeling and can be a hazard to blind and partially sighted people. Visual aids such as high visibility markings and tapping rails on the outer stands in a row or contrasting colour/texture paving may be used to delineate cycle parking areas.
- potential to integrate with existing street furniture, signing or planting.
- located on level ground or, if this cannot be achieved, perpendicular to the slope to avoid cycles rolling down the slope.
- located in obvious, clean, maintained and overlooked areas to deter vandalism/theft, and to make users feel safe and welcome.
- located where a safe, comfortable, coherent, attractive and direct route is available to/from the facility.

14.7.15 Cycle parking stands should be large enough to accommodate the dimensions of a typical adult size cycle, as given in chapter 9. Some of the stands should be designed to accommodate larger cycles and trikes or cycles constructed for carrying freight or children where they can be expected to park frequently – these should be clearly marked and alongside adequate provision for standard cycles. In all cases the location of cycle parking should ensure that parked cycles will not obstruct nearby walking, wheeling, and cycling routes.

Whilst not covered under the definition of active travel within the Act, use of children's scooters to and from school is a popular mode of travel, and consideration should be given to safe and secure storage of these alongside cycles.

Figure 14.20: Example of scooter parking rack at a school

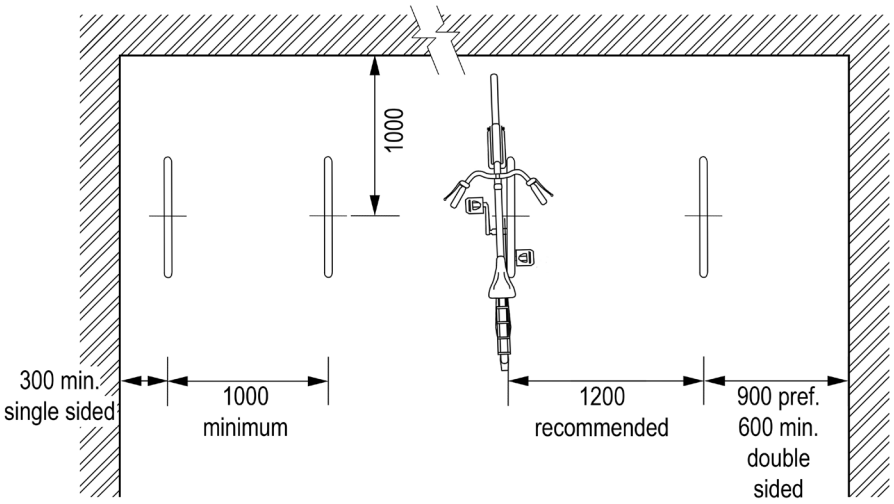


14.7.16 Cycle stands placed too close to a wall or fence will inhibit two-point locking and consequently the bike may be more likely to fall over. Sheffield stands should be placed at least 600mm from any wall or kerb (approximately 1000mm to the centre of the stand) to allow for the overhang of the wheels. Cycle stands placed too close together will reduce capacity by preventing the usual practice of one Sheffield stand being used for two cycles (one each side); the recommended gap between stands should be 1200mm, with a minimum of 1000mm, see figure 14.21.

Table 14.6: Space required for cycle parking

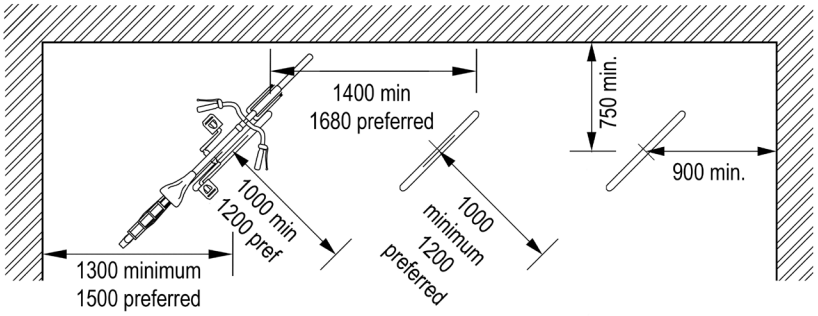
Situation	Dimensions	Area per cycle
Stands on street	1.8m x 0.5m	1m^2
Within building – minimum	1.8m x 0.5m spaces plus 1.8m aisle	1.35m^2
Within building – desirable	2.0m x 0.75m spaces plus 3.0m aisle	2-3m^2

Figure 14.21: Recommended layouts and dimensions for Sheffield stands – perpendicular and echelon



First and last stands should include tapping rail (see section 14.7.19).

14.7.17 An additional clear space width of 1500mm may be added to the layout to allow for non-standard cycles and this space should be signed to indicate its appropriate use.



14.7.18 Where cycle stands are placed immediately adjacent to a carriageway there is a risk to people cycling stopping and wheeling bikes into and out of the stand. Designers should consider the speed and volume of local traffic when assessing this risk. The position of other existing or proposed street furniture, such as bus shelters or benches, should be taken into account.

Stands should not be placed where they obstruct the flow of pedestrian traffic or reduce available footway width for people walking and wheeling beyond the recommended minimum.

14.7.19 In on-street locations where space for cycle parking is limited, for instance constrained or busy footways, consideration should be given to the placing of cycle parking stands on the carriageway, or on build-outs between parking bays. This may require the reallocation of existing kerbside car parking. Such provision should include a tapping rail on the end stands for long-cane users to detect them.

Figure 14.22: Good practice for siting cycle parking

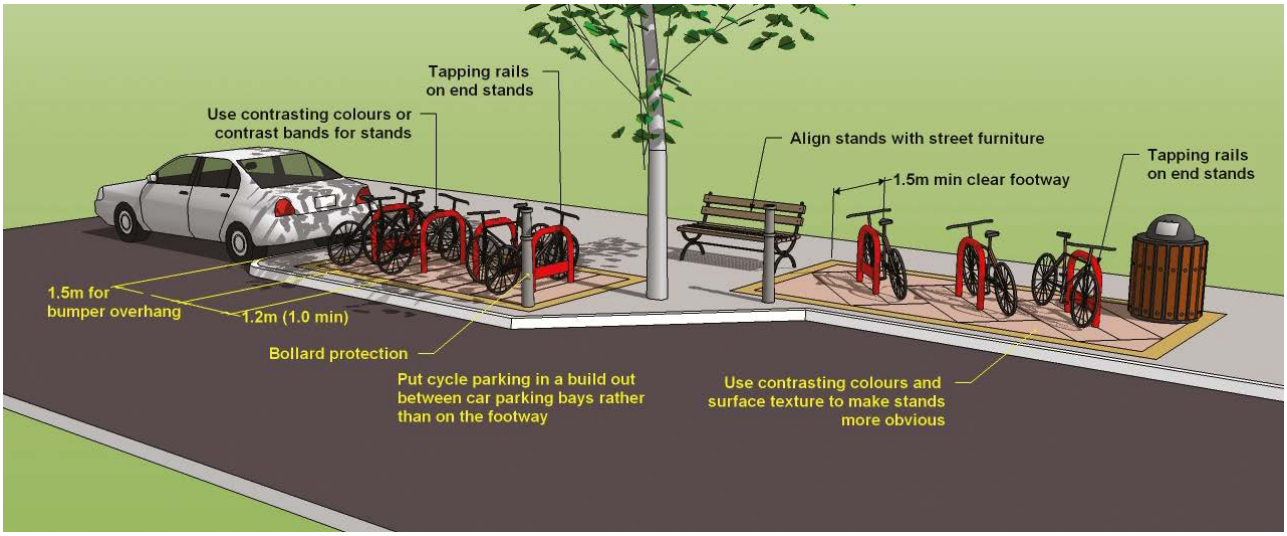


Figure 14.23: Car parking cycle stand



14.7.20 Around eight cycles can be accommodated in the same space taken by one car parking space. Care should be taken to minimise the risk of vehicles striking cycle stands or parked cycles – the stands will usually need to be protected through the construction of build-out extensions into existing carriageway space. For additional information on cycle parking, see standard for public cycle parking.

Residential cycle parking

14.7.21 Storage of cycles is an important consideration at both ends of a journey. Some housing types do not provide for suitable cycle storage facilities, for example flats which require stair climbs or high-density housing, such as houses of multiple occupancy (generally popular with students and young professionals). Unsuitable storage of cycles may lead to blocking of internal corridors or stairwells, inhibiting evacuation or rescue in event of emergency. Secure communal cycle parking, such as relocation of a parking bay to accommodate a cycle locker can provide a solution to this and be a much more efficient use of roadspace by serving a greater number of people's transport needs.

Figure 14.24: Secure residential cycle parking





Commercial cycle parks

14.7.22 In urban locations with high demand for regular long-stay parking such as transport interchanges and city centres it may be appropriate to provide paid for cycle parking facilities. Such facilities typically offer high numbers of secure and dry cycle parking spaces on a commercial basis, and may also lease spaces to nearby residential and office blocks.

14.7.23 The commercial viability of such facilities is likely to be related to the availability of other cycle parking locally and the additional services offered such as:

- cycle hire.
- bicycle retail and repair.
- gymnasium.
- coffee shop/café/bar.
- newsagent/grocery.
- showers, changing rooms and lockers.

Security

14.7.24 No facility can ever be 100% proofed against theft. The overall security of the cycle parking is affected by:

- quality of the user's lock and how it is used to secure the cycle.
- location of the cycle parking relative to other uses of the street/building.
- site of the cycle parking within a property.

- levels of visibility and illumination.
- quality of design and construction of the cycle parking stand/mechanism.
- security of the installation of the cycle parking stand/mechanism into the ground.
- whether it is fully open to the public or only to selected users.
- quality of locking mechanism and other construction.

14.7.25 Cycle thieves target places where they can easily find items that can be quickly sold and where they are least likely to be detected. Passive surveillance and CCTV can help to deter crime and identify perpetrators, but in practice thieves are rarely noticed or challenged.

14.7.26 To improve security cycle parking equipment should be either embedded in concrete or bolted down. Where the legs of tubular cycle stands are embedded into concrete the addition of a tie bar beneath the ground can help ensure that the stand cannot easily be loosened and pulled out if the surrounding terrain is unstable or constraints mean that the manufacturer's recommended minimum construction depth cannot be achieved.

14.7.27 Tamper-proof fixings should be used where stands and other types of parking are bolted down, and to secure component parts of cycle parking fixtures. Hexagonal nuts and bolts, allen/hex keys or torx/star bolts and crosshead bolts or screws should be avoided as these can all be undone with commonly available spanners.

14.7.28 Guidance produced on behalf of the Bicycle Association 'Standards for Public Cycle Parking' includes measures for ensuring good security of cycle parking at railway stations. It is also useful as a guide for other locations.

14.7.29 Short stay and long stay parking present different risks of theft. The risk level also alters overnight when the number of passers-by is much reduced. It is important to think about how and when the cycle parking will be used when considering appropriate layers of security.

14.7.30 Where cycle parking is in busy open areas, users may be more relaxed about security and use a less secure lock or attach the cycle to insecure street furniture. Thieves target cycles that can be easily removed with simple hand tools, and then use the stolen cycle to getaway unnoticed. Promotional materials and warnings displayed around the cycle parking facility can help remind users to lock their cycle securely.

14.7.31 In long stay cycle parks, and where cycles are parked overnight, thieves may have the opportunity to work undisturbed for longer, using battery powered tools as well as hand tools. Limiting access to registered keyholders therefore provides an additional level of security.

14.7.32 Useful insights into methods of cycle theft have been gathered by police and journalists interviewing former cycle thieves over the years to understand their behaviours. These insights are useful when planning new cycle storage facilities to minimise opportunistic theft. Some examples by Road.cc and Stolen Ride can be found in the useful resources.

Maintenance and monitoring

14.7.33 Future maintenance of facilities should be considered and responsibilities determined at the design stage of installing new cycle parking. Poorly maintained features are unlikely to instil confidence in people cycling that the provision is a secure place for storage. Finishes such as galvanised steel can help to reduce maintenance costs, though this should be considered against the context of the area and likely users. More prominent colours would be more appropriate where the majority of users are touring or passing through occasionally.

14.7.34 A system should be in place to identify and remove abandoned cycles. For public facilities this can incorporated into maintenance schedules by recording and identifying cycles that have not moved from the stand for a long period. For controlled access facilities the terms and conditions of use can specify a maximum period after which unused cycles will be removed.

14.7.35 Where cycle parking has already been provided, regular counts can help to establish patterns of use and trends over time. Once the cycle parking occupancy regularly breaches 90% this can trigger the provision of additional capacity. When counting parked cycles and occupancy of stands, it is also important to note how many cycles are parked informally (away from cycle parking stands) to get a true picture of the total demand. In some cases informal parking may also occur if the formal parking stands are located in an insecure or inconvenient location, and may therefore be indicative of the preferred location.

Temporary cycle parking

14.7.36 Provision of temporary cycle parking should also be considered for special or temporary events. This should follow the principles as outlined in this Chapter. Various events across Wales have implemented cycle parking close to security entrances where there is good natural surveillance. The parking should be clearly marked, as well as a deadline by which cycles should be collected before the parking facilities are removed.

Figure 14.25: Temporary cycle parking, Tafwyl Festival



14.8 Public cycle maintenance facilities

14.8.1 Provision of bike maintenance facilities made available for public use, such as air pumps and basic tools are becoming more common. Locating these along well-used routes or at cycle parking locations and hubs can help to install confidence for potential users and is also a positive reinforcement that the local authority is encouraging cycling.

14.8.2 Such features should be placed in clear view to raise awareness and ideally in areas well overlooked to damage or theft. They should be provided within well-lit areas to ensure users can clearly identify tools and any associated instructions. Potential users may be unfamiliar with the design of some tools (for example, an on street pump may look considerably different to a personal pump) so they should be clearly labelled – including that provision is free.

14.8.3 To further deter theft publicly available tools should be tethered. It is therefore important that enough space provided around such features to ensure the tools are accessible to be used on a variety of cycle types. Space requirements outlined within chapter 9 can also be applied in this instance.

Figure 14.26: Public cycle maintenance facility, Swansea



14.9 E-cycle charging facilities

14.9.1 The rise in popularity of e-cycles in recent years, and their potential to cover greater distances than standard cycles and so increase the number of people and miles being cycled, merits investment of charging facilities for e-cycles.

Figure 14.27: Public e-cycle charging facility, Aberystwyth



14.9.2 E-cycles are currently considerably more expensive than standard cycles. As a valuable asset owners of e-cycles may be particularly cautious about the risk of theft, and therefore may be keen to use more secure, longer-stay parking facilities. Some users may decide to remove the battery pack whilst using standard cycle parking to render the cycle inoperable. Nearby lockers can therefore be useful but it is also common for users to take the battery pack with them and charge it remotely. Not all e-cycles have removable batteries however, so providing charging points at long term cycle parking locations is likely to be in increasing demand.

14.9.3 The provision of charging facilities are best placed in cycle hubs, or longer-stay cycle parking destinations, such as residential areas, schools or workplaces. Publicly available charging facilities should be clearly marked and ideally provided adjacent to suitable provision for non-electric cycles to deter parking of pedal cycles blocking charging facilities. Ideally, they should be placed in locations convenient to destinations where people can spend time whilst awaiting the e-cycle to charge, for example libraries and shopping centres or in a town centre location.

Figure 14.28: E-cycle public hire docking station



14.10 Cycle footrests

14.10.1 Footrests can be useful additions when placed adjacent to cycle tracks in locations where cyclists may have to wait, for example, adjacent to the stop line at signalised crossings or junctions. These can also incorporate wayfinding or local characteristics.

Figure 14.29: Cycle footrest, Cardiff



Figure 14.30: Cycle footrest, Cardiff




Green Roof Shelter

Chapter 15: Construction, maintenance and management of active travel routes, including street works

This chapter provides guidance on the construction, maintenance and management of any walking, wheeling or cycling facility and associated matters. It also provides guidance on the specific considerations for people walking, wheeling or cycling where street works and construction sites affect their space within the highway.

Key areas for consideration include:

- surfacing options for active travel routes.
- sustainable drainage systems.
- access controls.
- management of active travel routes at street works.

15.1 Construction

15.1.1 Close attention should be paid to construction and maintenance standards to ensure that routes used by people walking, wheeling or cycling are safe and comfortable for all, as well as being aesthetically acceptable, easy to maintain and durable.

15.1.2 It is important to consider the full life costs and benefits when specifying materials and construction methods. Certain options may require increased capital expenditure at the outset but result in lower maintenance and management costs. It is only by considering street planning, street design and highway management that user needs can best be met.

Surfacing requirements

15.1.3 The typical choice for carriageways is a bituminous surface. Different products are available, each with their own properties, but the main choice is usually between Asphalt Concrete (AC) for low trafficked areas and Stone Mastic Asphalt for high trafficked areas (see WG PAG 112/20). Thin Surface Course System (TSCS), often based on these materials, are also commonly used.

15.1.4 All active travel routes should be machine-laid rather than hand-laid where possible. Hand laid surfaces result in imperfections in surface profile caused by variations in compaction. These vertical imperfections result in unconformable wheeling and riding conditions, and can also cause puddles. Machine laying offers a superior riding and wheeling surface. All new surfaces require close inspection and testing for quality defects, including vertical alignment, before acceptance. As noted in chapter 9, a smooth surface with negative texture significantly reduces the effort needed to push, wheel or cycle, adding to comfort.

For this reason, Thin Surface Course Systems (TSCS) are recommended as the preferred surfacing for active travel routes.

15.1.5 A surface course with 6mm aggregate is preferred on walking, wheeling and cycling routes due to the reduced rolling resistance it offers for all forms of wheeled transport. In areas shared with vehicles (such as accesses or priority crossings) a 10mm aggregate on binder, base and a thicker sub-base layer is recommended. An 80mm single layer of 14mm aggregate replacing surfacing and binder is also commonly used in these situations. Surface courses with larger aggregates (up to 20mm) may be preferred where leaf litter poses a skid, slip or low-traction hazard to people cycling, power chair users and wheelchair users. The coarser aggregates can offer improved grip in such situations. Typical scenarios where this is appropriate include off road paths and ramps with tree cover. Refer to DMRB CD239 for layer thicknesses.

Figure 15.1: Negative/positive texture of path surfaces



15.1.6 Modifications to the surface may be required to incorporate cycle lanes, advanced stop lines, or traffic speed control measures (traffic calming). Dimensional tolerances should follow normal highway standards.

15.1.7 Where kerb re-alignment is needed any new carriageway construction should be to normal highway standards, unless there is kerb separation of the cycle lane, when a lighter construction may be used. Surface quality should remain to highway standards and care taken to allow carriageway to withstand the load of sweeping and maintenance vehicles.

Coloured surfacing

15.1.8 As noted in chapter 11, black bituminous surfacing in conjunction appropriate lane markings and cycle logos, is satisfactory in most circumstances and colour should be used sparingly (at conflict points). Extensive use of coloured surfacing is not recommended as it increases maintenance costs. Poorly maintained coloured surfacing can also pose an additional hazard for people walking, wheeling and cycling.

Footway construction

15.1.9 Footway construction should be of sufficient depth to withstand the loads likely to be imposed on it.

15.1.10 Consideration should be given to the likelihood of accidental or intentional overrun of a footway by heavy vehicles and the strength/thickness increased accordingly. The construction at vehicle crossovers will need to be thicker than the adjacent lengths of footway. Cracking or rutting of surfaces due to overloading can be unsightly, create trip hazards and/or drainage problems. The construction specification for footways, footpaths and cycle tracks is contained in DMRB CD239.

Footpath construction

15.1.11 Where a footpath is constructed away from the highway, consideration should be given at the design stage to the practicalities of constructing the path and access arrangements for construction vehicles.

15.1.12 Access points to some paths can be several hundred metres away and may require material to be moved by dumper truck. This might be satisfactory for moving sub-base materials but keeping tarmac hot enough to lay properly may be a concern. Additional access points may need to be constructed, and the path may need to be strong enough to carry heavy plant associated with the works.

15.1.13 Where a footpath provides regular access for maintenance vehicles (for example adjacent to waterways or rail lines), the surfacing and construction of the path needs to reflect this.

15.1.14 It may be necessary to thicken sub base layers, or use geotextile materials where ground conditions are poor. Where paths use land that is contaminated it is best to avoid excavating, use an alternative alignment or raise the path levels if the area cannot be avoided.

15.1.15 If the path intersects any tree root protection zones, non dig construction will be required. There are several systems in the market suitable for construction on root protection zones, which do not compact the tree roots, allowing for water and air to circulate, maintaining nutrient supply (as per BS5837).

Cycle track construction

15.1.16 One of the common reasons why some people cycling use the carriageway in preference to a roadside cycle track is that the ride quality of the carriageway is often of a higher standard and therefore more comfortable. The surface quality of the cycle track should be at least as good as that of the adjacent road and should always be machine laid.

15.1.17 Among the most important considerations in choosing an appropriate surface material are cost (and variation by colour), durability and skid resistance. Polished stone value (PSV) gives a measure of skid resistance. A PSV of 55 is normally acceptable for road skid resistance. Table 15.1 shows, indicatively, a comparison of different surface materials and treatments according to these criteria.

15.1.18 The preferred surface is machine laid bituminous material, although bound or unbound aggregate, concrete, stone flags or paving blocks are sometimes used. Unbound aggregate surfaces are generally unsuitable in an urban/urban fringe environment. They cause excessive dust in dry weather and can be susceptible to ponding and become muddy in wet weather, leading to rapid deterioration.

15.1.19 Paving blocks, concrete or stone flags will provide a more aesthetically attractive finish and are more suited to high quality public realm areas. The surface finish should have adequate skid resistance, the joints will be less comfortable to cycle on and paving can be more problematic to maintain if slabs become loose.

15.1.20 There may be local sensitivities around surfacing of paths with black bituminous material in areas of high heritage value or green spaces. These should be considered and addressed as part of the consultation and the use of appropriate materials and in the right colours should always be paramount. There are a range of options for appropriate materials which should all be assessed against the aims of the overall project at the early planning and design stage.

Table 15.1: Surface treatment for cycle routes

Surface material	Yes (years)	Skid resistance (PSV)
6mm asphalt concrete	20	60+
Coloured TSCS, 30-50mm thick	20	55+
Block paving	20	55
Brick paving	20	-
Concrete paving flags	10	-
Tactile paving	10	-
York stone flags	20	-
Granite paving flags	20	-
Thermoplastic High-Friction Surfacing	4-6	70+
Resin High-Friction Surfacing	8-10	70+
Cycle Track Veneer (thermoplastic slurry)	5	55+
Cycle Lane Veneer (polymer binder)	10	55+
Slurry Seal (poor colour and life)	5	55
Surface Dressing – Granite Stone (bituminous binder)	20	60+
Surface Dressing – Granite Stone (clear binder colour enhance)	20	60+
Surface Dressing – Pea Shingle Stone	20	50

Tactile paving

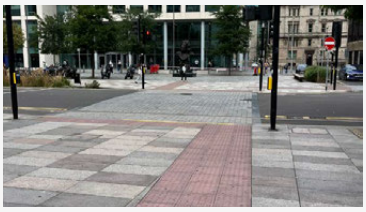
15.1.21 Tactile paving is provided on walking routes to assist blind and partially sighted people in moving around an area and on separated shared-use routes to navigate safely, preventing people from walking or wheeling into the cycle track inadvertently. Some of the types of tactile paving and their typical uses are listed in table 15.2. The most common form of tactile paving provided in association with walking and wheeling routes is blister tactile paving at road crossings.

15.1.22 Guidance on the provision of tactile paving is set out in the Department for Transport's publication 'Guidance on the Use of Tactile Paving Surfaces' and reference should be made to that document when specifying tactile paving.

15.1.23 Current national guidance covers simple layouts but does not give detail for the wide variety of layouts that are encountered.

For non-standard layouts designers need to apply the principles contained in the Department for Transport's guidance and consult with local groups who represent blind and partially sighted people during the design process.

Table 15.2: Tactile paving

Type of tactile paving	Typical usage	Typical example
Blister (red coloured)	For use at controlled crossings (signalised and unsignalised).	
Blister (buff coloured)	For use at designated uncontrolled crossings.	
Corduroy/Hazard	To be used in any situation (except at a pedestrian crossing) to notify visually impaired people of a potential hazard. This includes: • at the top and bottom of steps. • at kerb-free transitions between a footway/path and a shared use space. • at either side of a shared use bus stop to notify alighting passengers that they have entered a shared use space. • at the cycling section of a parallel crossing.	

Type of tactile paving	Typical usage	Typical example
Ladder and tramline	For use at a transition between a shared use space and segregated footway and cycle track.	

Edgings, kerbs and verges

15.1.24 Active travel routes may require some form of edge restraint to maintain their structural integrity. Where a route is not adjacent to a wall or building an edging strip is used. Edgings are generally formed from precast concrete units, but can also be made of other materials such as timber, aluminium, galvanised steel. Any edge treatment will increase the overall cost – pre-cast concrete kerbing roughly doubles the cost of a path. Timber edging may be adequate in rural areas away from the highway, and where the ground is stable.

15.1.25 In many locations away from the highway an alternative to kerb edgings is to construct the sub-base and binder course 300mm wider than the path, providing a 150mm shoulder on either side to support the path.

15.1.26 A kerb is normally used to delineate the carriageway and footway of a road. The kerb offers a degree of protection to people walking and wheeling and can assist blind or partially-sighted people to identify the edge of the footway.

15.1.27 In lower speed streets and access-only streets it may be appropriate to omit the kerb. In these areas the impact of not providing a kerb on blind or partially-sighted users should be considered with appropriate use of tactile paving to aid blind or partially sighted users to navigate an area. If it is deemed inappropriate to omit the kerb and a kerb upstand is to be retained, kerb heights should be as set out in table 15.3.

Table 15.3: Kerb details and heights

Location	Upstand	Typical example
General	75mm to 125mm. Half battered profile adjacent to footway.	
Splay	Where adjacent to cycle track or on high speed roads where there is no adjacent footway.	

Location	Upstand	Typical example
Pedestrian or cyclist crossing	Flush with tactile paving. Any upstand makes it more difficult for wheelchair users.	
Vehicle crossover	25mm for a standard kerb. 75mm to 125mm for an entrance kerb. An upstand of below 60mm can be difficult for blind and partially-sighted users to detect and therefore, use of an entrance kerb to maintain a level footway and more easily detectable kerbline is recommended.	
Edging	Flush with surfacing.	 
Bus kerb	Specialist bus kerbs can provide a height between 160 and 220mm.	

15.1.28 Where a footway or cycle track is provided adjacent to carriageway, horizontal separation may be required depending on the motorised traffic speed. Please refer to table 9.11. In some cases, a rain garden can be used as separation (see section 15.2)

15.1.29 On off-carriageway routes, a verge of between 0.5m and 1m should be maintained each side of the path. The mown edges prevent vegetation encroaching and making the footpath or cycle track unusable. The remainder of the verge may be left and may be valuable to wildlife.

15.2 Drainage

Introduction

15.2.1 Drainage systems should be considered at the earliest stages of design to influence the layout and route of the carriageway. Standing water and poorly-designed surface water run-off can cause problems for users and damage pavement construction. Keeping water off and moving it away from a carriageway or path will increase the longevity of the pavement structure and increase its use. Any drainage system needs to be efficient and reliable and may need to extend beyond the immediate edges of a new path to be effective.

15.2.2 Where the water comes from and how it is disposed of needs proper consideration as part of the route design. Poor drainage can lead to safety and maintenance issues. New surfaces must consider Sustainable Drainage Systems (SuDS) solutions that can help reduce the pressure on existing urban waste water systems, flood risk and water quality of receiving waterbodies.

Sustainable drainage

15.2.3 Schedule 3 of the Flood and Water Management Act 2010 came into force in Wales on 7 January 2019. Supported by a suite of secondary legislation it introduced a duty on developers to seek approval for Sustainable Drainage Systems (SuDS) to be used in the management of surface water. The Duty applies where the area covered by construction work equals or exceeds 100 square metres.

15.2.4 The Statutory SuDS Standards, which accompany the legislation, set out the requirements for the design, construction, operation and maintenance of sustainable drainage systems.

15.2.5 The policy seeks to manage surface water runoff in a way that both employs and mimics natural processes, with increased protection for property from the risk of flooding, within project designs. It promotes the management of surface water close to its source and close to the surface of the land, creating multi-functional spaces through better integration of drainage solutions with added amenity and biodiversity benefits.

15.2.6 The role of approving, and in appropriate cases adopting, the sustainable drainage system falls to the 22 SuDS Approving Bodies (SABs) in Wales, a function of the local authority.

15.2.7 The SABs must have regard to statutory standards and statutory guidance produced by the Welsh Government to assist with the interpretation and implementation of the policy. Requirements for drainage adoption and drainage maintenance arrangements are set out in these documents.

15.2.8 SuDS are viewed as one of the key tools for facilitating sustainable development and helping public bodies meet obligations under the Well-being of Future Generations (Wales) Act 2015.

15.2.9 The Statutory SuDS Standards set out the requirements for sustainable drainage systems in the following areas:

- surface water runoff destination.
- surface water runoff hydraulic control.

- water quality.
- amenity.
- biodiversity.
- design of drainage for construction, operations and maintenance.

15.2.10 The most effective SuDS use a series of various drainage components including planted areas, that work as an integrated process to control rain water flow rates and reduce volumes of runoff. The natural filtration provided by appropriate planting provides treatment to protect water quality and opportunities to encourage biodiversity and amenity.

15.2.11 Rain gardens are one component or technique that can be utilised within a wider SuDS strategy. Bio-retention rain gardens can manage most rainfall events and treat pollution and silts at source.

15.2.12 A bio-retention rain garden intercepts a limited volume of the most polluted runoff from urban areas – the 'first flush'. They treat pollution in runoff by allowing water to percolate through a designed soil for cleaning, collect the clean water and discharge it slowly through infiltration, to a watercourse, to the surface water sewer or combined sewer. They also maximise 'natural losses' from evapotranspiration from vegetation.

15.2.13 The volume of water they can attenuate is limited due to available space and size. They also require ongoing management and maintenance, planting can be vulnerable to drought, and they need to integrate with underground utilities and services. Selecting the correct soil specification is critical to a successful outcome.

15.2.14 Designing SuDS into new active travel routes at the earliest opportunity will help result in positive improvements that benefit both active travel and the environment. Costings for the SuDS element will be reduced by making the features an integral part of the amenity design, rather than expensive retrospective costs.

15.2.15 When it comes to the maintenance of SuDS, surface-based components which are visible in their operation and performance are generally simpler and easier to operate, monitor and maintain. These activities can normally be undertaken alongside or as part of routine management operations for any carriageway.

15.2.16 Well designed, easy to maintain SuDS will deliver a range of important benefits for the local environment and local communities, in addition to contributing to the delivery of the Water Framework Directive, local flood risk management, Local Biodiversity Action Plan objectives, Well-being of Future Generations (Wales) Act 2015 obligations and sustainable development consistent with the Planning (Wales) Act 2015.

Trees

15.2.17 In bringing forward walking, wheeling and cycling schemes, designers should check proposed routes against the Ancient Woodland Inventory, or the (incomplete) Ancient Tree Inventory.

15.2.18 Where trees are in proximity to a proposed scheme a tree survey should be undertaken by a qualified arboriculturist to assess the health of the tree and the extents of root protection zones. Designers should also identify whether any Tree Protection Orders apply – see this guide on Protected Trees for more information.

15.2.19 When working near roots of trees, designers should consider 'no-dig' construction techniques, for example using geocell grid products that don't require excavation which could damage existing tree roots. They should also consider the use of porous fill and path construction, such as no-fines' tarmac and open graded aggregates, to maintain oxygen, carbon dioxide and water transfer to both roots and mycorrhizal biomes.

15.2.20 Only in circumstances where all other alternatives have been exhausted, for example no alternative routes are feasible, or due to safety reasons, should a tree be removed. In this scenario, designers should replace any mature tree lost with at least three new trees within the local proximity to where the mature tree was removed.

15.2.21 Designers should consider the most appropriate time of year to fell a tree – normally in the dormant winter months. Designers may also consider whether the felled tree could be retained safely as a play feature and/or for ecological benefit (see section 8.7).

15.2.22 Where mature trees coincide with high priority ATNM routes, an arboricultural succession plan may be useful, to plan for and establish replacement street trees in advance of mature tree removal. This may help a Local Authority proactively mitigate foreseeable stakeholder and public objections to reasonable tree removals required for active travel infrastructure. In the longer term, providing properly sited street trees including within engineered tree pits, rather than accommodating historic ones planted without proper root management, will reduce maintenance costs and other liabilities arising from tree-related hazards. When establishing new trees, there are also many subterranean constraints to consider including the location of utilities and underground services. Engineered tree pit solutions offer effective ways to integrate trees within the streetscape to ensure sufficient root volume, aeration and drainage whilst not adversely impacting the necessary load-bearing properties of tree pits (Bell, 2024)[1].

There are two key methods:

- **Crate systems** (also known as soil cells, structural cells and soil vaults) are typically made of high strength plastic formed into a framework of structural cells. The cells act as a series of vaults to support a large volume of uncompacted soil in the root zone – critical for supporting trees to establish.
- **Structural soils** (also referred to as 'structural growing media' or 'designed soils') comprises a range of different aggregate or sand based growing media that, when compacted, can provide conditions for establishing tree growth whilst also maintaining load-bearing support.

The structural soil method is often associated with the City of Stockholm which has pioneered this approach. Designers should seek advice on soil specification from suitably qualified professionals.

1 Bell, 2024 – PhD Thesis. The impact of engineered tree pit solutions on street tree growth and survival (see useful resources).

The journal paper from Bell, Doick & Sinnett, 2024[2], provides a useful summary of the main approaches and applications of these two approaches and their effectiveness in establishing trees in urban environments and improving survival rates.

On-carriageway drainage

15.2.23 On the carriageway, attention will need to be paid to gully location and levels, which are critical for the comfort and safety of people cycling as well as drainage along the route. This is particularly important where full or light separation for cycling has been introduced, since people cycling may find it difficult to avoid gullies. Acceptable gully characteristics are as follows:

- the grate slots should be at right angles to the direction of travel so that thin cycle wheels do not become trapped in them. Alternatively, non-slot 'pedestrian style' gratings should be provided.
- gulley width should be less than a third of the overall cycle lane width.
- no gaps between the frame and cover wider than 15mm.
- recessed gully frames raised to be flush (tolerance +/- 5mm) with the surrounding surface.
- equipment suitable for their location to take public highway loadings; and
- opened in a manner suitable to be cleansed by a normal gully cleansing or jetting machine under the local highway authority contract.

15.2.24 Any gratings unsuitable for cycling across should be replaced. Side-entry gullies or perforated kerb type gullies may be suitable in some circumstances, particularly where there is restricted width and where people cycling will be close to the kerb.

15.2.25 Fully separated cycle tracks and stepped tracks will need additional gullies as well as appropriate falls to facilitate run-off. A minimum grating size of 300 x 300mm is recommended, as the smaller size gully gratings that are sometimes used in off carriageway situations tend to become blocked with leaf fall and other debris.

15.2.26 A gully should be provided in the carriageway at the upper side of any crossing for people who walk, wheel or cycle to prevent surface water running across the area in which people step into the carriageway. Every effort should be made to avoid water ponding at crossing points, including considering carriageway profiles and the location of appropriate drainage facilities during scheme construction and highways maintenance works.

Off-carriageway drainage

15.2.27 Where new routes are being constructed, or widened into soft verges, consideration should be given to the effects of an increase in the volume of surface water run-off on the existing drainage system. Once taken off the path surface it is essential that water is returned back into the drainage system at a suitable location. Simply diverting over land run off, or removal of flood water into the nearest ditch or culvert may create problems further downstream.

2 Bell DL, Doick KJ and Sinnett DE (2024). The role of engineered tree pit solutions in nature-positive civil engineering. Proceedings of the Institution of Civil Engineers – Civil Engineering, available in the useful resources.

15.2.28 To prevent ponding of surface water, or the formation of ice, a crossfall or camber should be provided on the path surface within the limits stated in table 15.4. Excessive crossfall is uncomfortable to walk on and can cause difficulties for people using wheelchairs, pushchairs or cycling.

Table 15.4: Crossfall specifications

Recommended crossfall limit	Crossfall (%)	Crossfall (y:x)
Minimum	1.5	1:67
Preferred	2.5	1:40
Desirable maximum	3.3	1:30
Absolute maximum (at crossings)	10	1:10

15.2.29 The direction of the crossfall should be set so that surface water does not run-off onto adjacent property where there is no highway drainage along the boundary. Typically, footways will fall towards the adjacent carriageway. On cycle tracks the crossfall should generally fall towards the inside of a bend.

15.2.30 Where it is not possible to provide a continuous crossfall across a path, either due to the relative levels between the kerb and the back of the path or the width of the path, it will be necessary to provide drainage channels within the path. Table 15.5 sets out four options.

15.2.31 If gullies or gratings are used as part of a path drainage system a heel proof grating should be specified.

Table 15.5: Drainage channels on paths

Measure	Advantages	Disadvantages	Typical example
Dished channel blocks	Easy to maintain.	Trip hazard. Requires gullies. Can result in ponding water. Not suitable on cycle routes.	
Flat channel blocks	No trip hazard. Easy to maintain.	Less capacity. Requires gullies. Can result in ponding water.	

Measure	Advantages	Disadvantages	Typical example
Linear channel with gratings	Can avoid having to create a low spot in surface.	Prone to blocking and silting up. Gratings can work loose and cause trip hazards.	
Linear slot drain	Visually un-intrusive. Can have high capacity (in pipe below ground).	Prone to blocking and silting up. Have to be jetted or rodded to be cleaned.	
Fluted channel blocks	Easy to maintain. No trip hazard.	Requires gullies. Can result in ponding water. Less capacity.	

15.3 Access controls

15.3.1 Access controls are sometimes placed on off-carriageway routes to prevent access by unauthorised vehicles, particularly motorcycles.

15.3.2 Designers should start with a presumption against the use of any form of access control, installing only in response to evidence of actual problems of abuse of walking, wheeling and cycling facilities, and never simply in response to perceived problems. If being considered, local authorities should keep a log of the evidence and a record of the subsequent decision process. The Wales Active Travel Board highlights in the Active Travel in Wales Annual Report 2024-2025 that access controls can unlawfully impede access for people with disabilities, and should be removed where possible.

15.3.3 Access control infrastructure along an active travel route can cause difficulties to many legitimate users and can render routes inaccessible to people who rely on mobility aids. They are also often ineffective in addressing the issues they are intended to prevent. In both these cases, existing access control infrastructure can be considered for removal or replacement as a stand-alone scheme, or as a part of a larger scheme. Restrictive access controls:

- are inconvenient, can be unsightly and can actively discriminate against some user groups who have legitimate rights to use a path including disabled people and users of non-standard cycles.

- extend the journey time for people cycling and so reduce the utility of a cycle route.
- add another level of cost, and maintenance concern, to a path.
- are frequently ineffective because fencing along a traffic free corridor is missing, broken or subsequently vandalised so that the access control can be bypassed.

15.3.4 Equality Impact Assessments (EqIAs) are undertaken to ensure that protected characteristics are fully considered when looking at the impact of a scheme, as required by the Equality Act (2010). If the need to change or implement any form of access control is determined at any point, EqIAs should be carried out and the objective justification reasons should be recorded within an audit trail (see appendix L). Further information on EqIAs can be found in section 9.3.

15.3.5 There is also a tendency to install access barriers to stop, or slow, people who cycle at the end of a path for safety reasons – whether actual, or perceived. This is often inappropriate, and designers should consider other solutions such as clear signing or other means of slowing people who cycle such as changing path geometry.

15.3.6 A single bollard, and clear sight lines will be effective in many locations. Double rows of bollards, with a minimum spacing of 1500mm can reduce cycle speeds and prevent motor vehicle access, whilst retaining better permeability for users than chicane barriers. See figure 15.2 below.

Figure 15.2: Access control using bollards



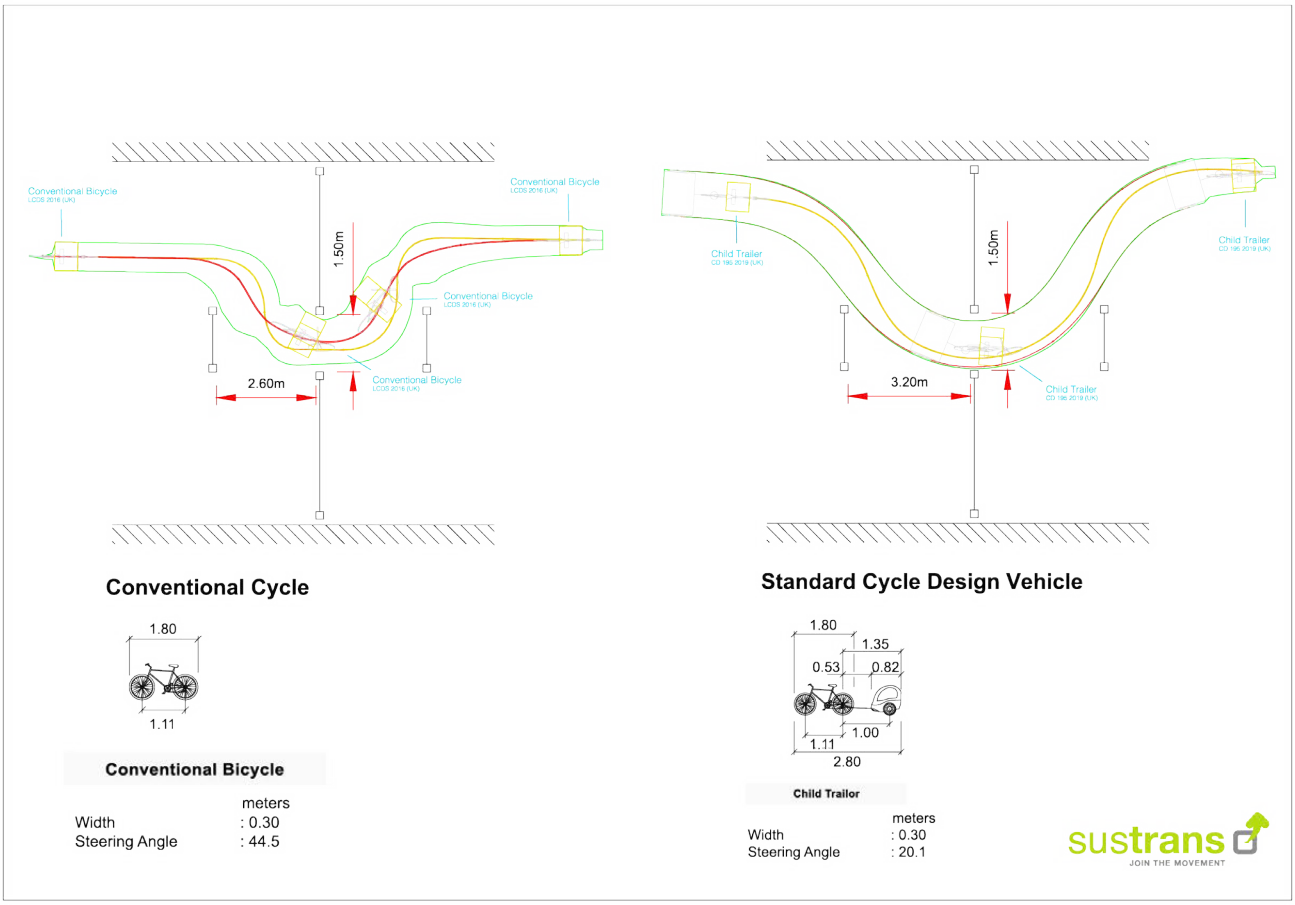
15.3.7 The visibility of any access controls should be considered at the outset as part of the design process. Clear sight lines and the location of any lighting provision should be taken into account so that the control can be seen easily and additional visibility on the control should be included (for example reflective strips or contrasting colours).

15.3.8 Walk Wheel Cycle Trust provides detailed information on assessing whether an access control is needed, and if so the most appropriate design solutions. Assessment information includes:

- legal issues, including the Equality Act.
- whether an access control is required.
- alternative measures to control access.
- risk assessment.
- deciding on type of access control required.
- design options.

15.3.9 The design of routes where there is a perceived need for an access control solution must include engagement with users in the local area, including groups representing disabled people. When considering design options, authorities should use swept path analysis, as highlighted in figure 15.3.

Figure 15.3: Swept path analysis through an access control



15.4 Fencing and hedgerows

15.4.1 Fencing may be required along off-highway paths for the safety of users, the security of neighbours and livestock control. Where needed fencing should remain visually unobtrusive.

15.4.2 New fencing has an impact upon all users, but especially people who cycle as a fence immediately adjacent to the path edge reduces the usable path width by 500mm.

15.4.3 Fences set 1000mm away from a path edge will provide a better visual aspect, and reduce the "tunnel effect" where fences line both sides of a path. Verges also provide space for drainage and ducting for lighting.

15.4.4 Security fencing can be harsh and oppressive, creating environments that are visually off putting to people walking, wheeling and cycling. A 1500mm high fence should be adequate in all but exceptional circumstances. To people walking and wheeling, they still provide views over, and the visual and aesthetic impact to a motor traffic free route is considerably less than with a taller fence.

15.4.5 Hedgerows form part of the immediate environment for many paths away from or alongside the road. They also provide important habitats for wildlife and connectivity (both visually and for wildlife) to the wider landscape. Developing routes that include at least one hedgerow as a boundary feature can re-invigorate them as dead wood, brambles and unwanted species are removed and new growth encouraged. Thorny species such as Hawthorn or Dog Rose should be avoided, but if used will require planting further back from the path edge to prevent hedge clippings causing cycle punctures.

15.5 Lighting

15.5.1 Walking, wheeling and cycling should be promoted as around-the-clock means of transport, rather than just a daylight activity, if active travel is to play an important role as an alternative to the car for everyday journeys. Many walking, wheeling and cycle journeys will be made after dark, especially during the winter months.

15.5.2 Active travel routes should normally be lit to provide an adequate level of safety, both real and perceived. It is recognised that some authorities are looking to reduce lighting to reduce costs and light pollution, but the benefits of lighting a walking, wheeling or cycling route include:

- enabling users to orientate themselves and navigate the route ahead.
- enabling users to identify other users ahead.
- enabling users to detect potential hazards.
- discouraging crime and increasing the sense of personal security.

15.5.3 It is important that lighting is considered at an early stage in the design process, so that the issues can be properly explored and the needs of users taken fully into account in the choice of equipment and the design of the scheme. Early consideration also mitigates potentially costly retrofitting of lighting and associated equipment into designs. Efforts to minimise light pollution and spillage in rural areas will be particularly important. In addition, where lighting is proposed in an area previously unlit, the impact on light sensitive species such as bats which are protected by law must be carefully considered. LED in-path lighting, bat caps and/or motion detection lighting can all help to mitigate these concerns.

Figure 15.4: Example of illuminated active travel route, Ebbw Vale



15.5.4 The level of lighting can be an exclusion factor. Some groups of people (such as women and girls, and LGBTQ+, for example) are more likely to feel unsafe in a dark space, especially if there is no passive surveillance.

15.5.5 Routes along urban and many rural highways will be lit by the existing highway lighting but specific lighting will be needed for off-highway routes. However, in lighting such routes consideration also needs to be given to wider factors, including:

- limiting levels of light pollution.
- level of ambient brightness in the surrounding area.
- the visual impact of the lighting equipment.
- intrusion on nearby properties.
- impact on natural habitats.
- the needs of visually impaired users for uniform illumination at surface level.
- vandalism issues.
- proximity of electricity supply.
- energy usage and cost.
- costs of installation, operation and maintenance.

15.6 Maintenance and management

Introduction

15.6.1 Maintaining the path or carriageway surface is of great importance to people walking, wheeling and cycling, including high standard reinstatement following works by statutory undertakers (see also section 15.7). It is essential to establish responsibility for maintenance of paths that are not part of the highway and put into place a regular regime for inspections. Having invested time and money to build the route, it is important that it remains attractive to users. A route that is kept in good condition will be more useful and popular than one allowed to deteriorate.

15.6.2 The quality of walking, wheeling and cycling infrastructure should be maintained, particularly keeping routes clean and ice free, in autumn and winter.

15.6.3 Highway authorities should therefore systematically look for synergies between their maintenance programmes and, identifying opportunities to deliver walking, wheeling and cycling improvements when carrying out planned highway maintenance works.

15.6.4 An example could include when road markings are removed during highway resurfacing, this creates an opportunity to reallocate part of the carriageway to people who cycle or to widen existing walking, wheeling and cycling infrastructure. General traffic lanes can be narrowed, wide central hatching can be removed, and the resulting space given over to cycle lanes, which can also be protected with light separation, all at minimal or low cost. Coloured surfacing for cycle facilities can also be introduced during planned resurfacing works, at junctions and other potential conflict points.

15.6.5 People walking, wheeling and cycling are disproportionately affected by poor highway maintenance, both in terms of safety and comfort. Cycling UK reports that claims made as a result of poor highway maintenance are on average 13 times higher for people who cycle than those made by people who drive, because the claim is much more likely to involve personal injury. Uneven footpaths can also cause particular issues for wheelchair users and prevent them from using a route.

Design with maintenance in mind

15.6.6 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. For example, an off-highway path surfaced with bituminous material will have a long life needing little maintenance, whereas a different surface treatment will need to be replaced more frequently.

15.6.7 The future maintenance burden on local highway authorities, both financial and operational, should be a major consideration for designers and it is recommended that both a value engineering and future maintenance audit are carried out on all proposed designs before implementation.

15.6.8 It is particularly important to think about maintenance at the start of the design process if the project has capital funding available, but maintenance will have to come from existing budgets. Sometimes money can be put aside from the capital source into a separate fund for future maintenance. Irrespective of what the arrangement will be, the design team should identify the future maintenance arrangements early in scheme development.

15.6.9 The Active Travel (Wales) Act 2013 mandates local authorities to improve conditions for active travel at every opportunity.

Maintenance responsibilities

15.6.10 Most active travel routes will be highways under the definition of the Act (a highway being a route that the public has the right to pass and re-pass), but this does not mean that the highway authority is always responsible for maintenance. Where the route is on the road it will usually be the responsibility of the highways authority but some routes may well be the responsibility of another part(s) of the council – for example the education authority if the route is through school grounds, or the recreation department for parks and open spaces.

15.6.11 Every department with future responsibility for the maintenance of the route needs to accept those responsibilities at the outset of the project and allow for them in future budgeting.

15.6.12 Many local parks and former railway greenways have local volunteer groups supporting the council teams to carry out maintenance activities. They provide a hugely valuable role, ensuring the local community is involved in its local path and promoting its use, as well as keeping the path in good order.

Maintenance tasks

15.6.13 Each local highway authority will have its own defect intervention criteria as part of their 'well maintained highways' process and established safety inspection regimes based on the hierarchical status and functionality of each asset.

15.6.14 The following list, though not exhaustive, gives some indication on the type of defects that affect walking and cycling network safety and serviceability.

- Carriageway, footway and cycleway surface defects:
    - broken/uneven walking, wheeling or cycling surface with defects meeting or exceeding applied intervention criteria.
    - worn walking, wheeling or cycling surface with suspect skid resistance – where appropriate, testing of the surface should be carried out to ensure adequate skid resistance for traffic expected to use it.
    - defective kerbs, edging and channels.

- Drainage and utility covers maintenance:
    - missing or damaged inspection or drainage covers and frames.
    - surface water flooding or severe standing water.
    - blocked surface water gullies and drainage systems.
    - ironwork surface texture.

- Ironworks, such as drainage gullies and utility covers, are particularly hazardous for people who cycle, being both slippery in wet conditions, and often associated with potholes which form around their edges. Where cycle routes are located on roads shared with motor traffic, such surface defects can lead to greater conflict, with people on cycles often having to make often risky manoeuvres.

- Guardrail, fencing and restraint systems:
    - missing or damaged posts, rails or barrier likely to cause a potential danger or render system ineffective.

- Signing, road studs and markings:
    - missing, damaged or illegible sign faces.
    - damaged post or fixings.
    - insufficient headroom from underside of sign.
    - insufficient offset from trafficked areas.
    - post/sign obstruction to passage or visibility.
    - loose sign brackets resulting in turned sign face.
    - failures to reinstate signing, markings or coloured surfacing denoting active travel facilities.
    - missing or damaged road studs.
    - missing faded, worn or incomplete markings.

- Street lighting, traffic systems, pedestrian and cycle crossings:
    - daytime lamp burn.
    - lamp out.
    - damage, corrosion to columns or posts.
    - damaged/turned heads or lanterns.
    - missing/loose access doors to columns or cabinet.
    - missing/damaged tactile paving at crossing.
    - missing/damaged tactile rotating cone on crossing.

- Verge, trees and hedges – on both rural and urban routes:
    - obstructed visibility or physical obstruction to free passage by vegetation, particularly at junctions and crossing points; cuttings to be kept clear of path surface.
    - root heave to surrounding walking, wheeling or cycling surface.
    - obvious damage, disease or poor condition of any tree within falling distance of the route.
    - need for periodic cutting back of adjacent grass verges or banks to maintain full width of asset.

- Cleanliness and weed growth:
  - unacceptable levels of leaf litter likely to cause drainage or safety issues for users.
  - unacceptable levels of litter, detritus or dog fouling.
  - sign face cleansing.
  - unacceptable levels of weed growth.
  - presence of noxious weed growth.
  - programmed cleansing of litter/dog fouling bins.

15.6.15 A poorly cleansed surface, apart from discouraging users, can present real dangers to the user. Bypasses and gaps for people cycling do not benefit from the movement of motor traffic to push debris out of the way, so these need to be of sufficient width for street sweepers and be regularly swept if they are to be usable.

15.6.16 Broken glass is one of the more obvious dangers to people walking, wheeling and cycling. Excessive leaf litter or detritus build up can cause potential slip hazards and impact on the efficiency of surface water drainage infrastructure.

15.6.17 Failure to control weed growth or to maintain hedgerows and verges can have a detrimental effect of the safety and serviceability of an asset as well as its attractiveness to users.

Placemaking elements

15.6.18 Seating and green infrastructure (including trees and planted areas) are integral part of infrastructure for walking, wheeling and cycling (see chapter 8). Therefore, planting and street furniture maintenance plans should be considered at the outset of a design project and integrated into wider maintenance planning. This should include clear responsibilities and allocated budgets. Where available, designers should consult local streetscape manuals to ensure consistency with wider streetscape strategies and maintenance programmes.

Bridges and other structures

15.6.19 Bridges usually have a separate inspection and management system from the rest of the highway and traffic free networks. Bridge owners such as local councils and Network Rail have sophisticated bridge management systems. These tend to focus on the structural condition of the bridge and can pay less attention to the environment of the bridge.

15.6.20 Thus graffiti can remain indefinitely unless reported to the council, making the whole environment look uncared for and potentially feel threatening for people walking, wheeling and cycling. Underpasses provided for people walking, wheeling and cycling to avoid busy roads are particularly vulnerable to this type of abuse making their use off-putting and an unattractive experience.

15.6.21 Smaller bridges in parks and similar motor traffic-free environments sometimes have wooden decks. Unless these are treated with a good anti-skid surfacing material at the time of construction they can become very slippery when wet. Once again, by considering the maintenance problems at the design stage, potential problems can be avoided before they become significant.

15.6.22 It is important to keep trees and bushes cut back close to bridges to allow inspectors a clear view of the structure and to avoid damage. Trees and bushes can affect masonry and cause damage to paintwork.

Winter maintenance

15.6.23 Local highway authorities are under a duty to ensure, so far as reasonably practicable, that safe passage along a highway is not endangered by snow or ice. Whilst this is not an absolute duty due to the qualification of 'reasonable practicality', the Active Travel Act raises the priority of walking, wheeling and cycling routes and this should be reflected in local authority's winter maintenance programmes.

15.6.24 It is not reasonable, due to the scale and cost to expect local authorities to apply this service to the entire highway network or ensure that treated sections of the network remain ice or snow free. However, well used walking, wheeling and cycling routes should merit a high priority in the same way that major motor vehicle routes are considered. It is not uncommon for people to choose alternative modes of transport over motor vehicles when there is heavy snow as often roads become unusable. There is also an equalities issue to keep pavements clear of snow and ice as older people or those without access to a car continue to rely on being able to walk or wheel to local services in all weathers.

15.6.25 It is therefore recommended that local highway authorities:

- undertake risk assessments of which parts of the walking, wheeling and cycling network should be identified for treatment in winter service plans.
- engage walking, wheeling and cycling stakeholders and users in the development of policies, winter service and operational plans.
- advise and inform walking, wheeling and cycling network users and stakeholders on the extent of the service and safe use during these periods.

Highway enforcement and custodianship

15.6.26 Although not strictly a maintenance function, local highway authorities also have a duty to assert and protect the rights of the public to the use and enjoyment of any highway, including active travel routes.

15.6.27 The following list, though not exhaustive, shows typical enforcement or controlling actions that may need to be taken to ensure compliance with statutory duties in relation to walking, wheeling and cycling. All the following have the potential to cause unnecessary obstruction or potentially unsafe conditions for people walking, wheeling and cycling and should be addressed by the local authority or police, as appropriate. Local authorities should consider how they can enable the public to easily report these infringements:

- placing of builders materials or skips within the highway.
- scaffolding within the highway.
- 'A' boards placed within the highway.
- parking of vehicles, trailers or caravans on the footway and across dropped kerbs.

- parking of vehicles, trailers or caravans on carriageway or cycle tracks so as to cause an obstruction.
- illegal signing within the highway.
- privately-owned vegetation encroaching on the highway.
- mud and soil deposited on the highway.
- control of statutory undertakers and maintenance works.

15.7 Walking, wheeling and cycle traffic at street works and construction sites

15.7.1 In the operation and maintenance of highway networks, it is necessary from time to time to put in place temporary traffic management measures to facilitate safe road works, temporary closures or incident management, whilst keeping the traffic flowing as freely as possible. These street works can affect all user groups and may impair the safety and free movement of vehicles, people cycling, and people walking and wheeling (particularly blind, partially sighted and disabled people). All steps should be taken to ensure that the effects of the works are reduced to a minimum.

15.7.2 Poorly planned temporary traffic management can be a danger to people walking, wheeling and cycling or make routes inaccessible to disabled people. Even if the actions are unintentional, such as parking a works vehicle on the footway, they can easily cause an obstruction to the route which places people walking, wheeling and cycling at risk in negotiating around the vehicle or the street works or road works site. This obstruction can make the whole journey unattractive causing potential users to switch to a less sustainable travel mode.

15.7.3 Under part 3 of the New Roads and Street Works Act 1991, local authorities and statutory undertakers must have regard to the needs of people walking, wheeling and cycling in:

- granting street works licences.
- giving directions as to the timing of street works.
- the placing of apparatus.
- restricting street works following substantial road works.
- exercising their duty to co-ordinate works, and
- giving consent to place apparatus on a protected street.

15.7.4 Local authorities, highway authorities and statutory undertakers must consider the effects that street works and road works may have on people walking, wheeling and cycling and addressing this will form part of the co-ordination process. Highway authorities must seek to minimise any disruption for people walking, wheeling and cycling when giving any directions or placing any restrictions on street works.

15.7.5 'Safety at Street Works and Road Works: a Code of Practice' (The Red Book) and chapter 8 of the 'Traffic Signs Manual' highlights the responsibilities of the designers of the works and traffic management to undertake risk assessments of the street works or road works site and the associated works in designing the temporary traffic management scheme.

15.7.6 Each street works or road works site will have different characteristics in terms of layout, available widths, walking, wheeling, cycle and vehicle flows, etc. and these need to be assessed to meet the needs of all road users.

15.7.7 On active travel routes special consideration must be given to people walking, wheeling and cycling. If provision cannot be made, then the designer must consult with their client or commissioning organisation regarding alternative provision. Such an alternative may be the provision of a diversion route that offers the minimum dimensions set out in this Active Travel Act Guidance.

15.7.8 The needs of all those who walk, wheel or cycle should be fully considered when putting in place any alternative arrangements. Wherever possible, maintaining access for people walking, wheeling and cycling should be a priority during street works and road works and in particular to consider whether any change from a separated route to an on-carriageway route is appropriate, safe and accessible to users. When it is necessary to close a road to motor traffic but it can remain open for people to walk, wheel or cycle, this should be made clear with appropriate signage.

15.7.9 Further details on appropriate measures for certain route scenarios are outlined within 114/20 Supplementary Guidance for the Safety at Streets Works and Road Works – A Code of Practice.

Figure 15.5: Street works with active travel provision





Chapter 16: Monitoring and evaluation

This chapter sets out why monitoring and evaluation of active travel routes and schemes is essential to help understand their impact and provide an evidence base for future investment. It also includes information on how this should be carried out.

Key areas for consideration include:

- a monitoring and evaluation plan should be developed for any new active travel routes and schemes.
- the investment in data gathering needs to cost-effectively establish the outcomes and impacts.
- some pertinent data might already be available from existing national or local datasets.
- the output from the analysis will need to be expressed clearly to communicate the findings to a range of stakeholders.

16.1 Introduction

16.1.1 Authorities should establish a programme of active travel monitoring, which will create a baseline for measuring future improvement and progress towards targets and policy goals. Over time, this will lead to the establishment of a catalogue of local data which is important for being able to make the case for future investment. Being able to demonstrate the impact of past investments can be particularly helpful when potentially controversial schemes are being developed.

16.1.2 Monitoring should often cover more than just levels of use of a route. For example, local authorities may wish to record changes in the number, severity and type of collisions at a particular site, or they may wish to record modal share at nearby schools or employers before and after a new route is implemented, or demographic characteristics of users.

16.1.3 The Act requires local authorities to measure and report upon changes in levels of use on active travel routes every time a revised map is submitted – usually every three years. Appendix F provides the current template for these reports. This chapter explores reasons for monitoring and evaluation and how it can be approached.

16.1.4 As part of the development of individual improvement schemes, monitoring should be incorporated as a key element from the outset and should be built into projects. The type of monitoring that is undertaken will depend upon factors most relevant to a specific scheme.

16.1.5 As noted in chapter 3, Llwybr Newydd has set a target of 45% of journeys to be made by public transport, walking, wheeling and cycling by 2040. This represents a significant increase from the estimated current mode share of 32%. This figure will be kept under review, with local authority active travel scheme monitoring helping inform the overall picture of progress against this target. Gathering pre and post scheme data as part of active travel infrastructure improvements is therefore important. Two national evaluation frameworks have been developed to monitor progress towards the commitments in Llwybr Newydd – the Active Travel Monitoring Framework and the Wales Transport Strategy Monitoring. These include quantitative measures across all modes using both new and existing sources of data, and will report annually.

16.2 Why monitor and evaluate?

16.2.1 Gathering data about the usage and impact of routes provides a justification for existing plans and schemes, helps makes the case for new proposals and with exploring future options. Typically monitoring will be used to:

- compare and prioritise scheme design options.
- compare active travel schemes with other local transport schemes.
- assess if schemes are having the desired impact and represent value for money.
- review operation of an experimental scheme, prior to deciding on whether to make it permanent.
- assess changes in travel behaviour post-implementation.
- assess the operation of innovative schemes to learn lessons on how the design might be improved in future.

16.2.2 When planning a new route or network, or improvements to existing infrastructure, data from other similar interventions and networks can be used as the basis for forecasting how usage or safety might change following the intervention, and thereby making the case to support the proposition.

16.2.3 Baseline data should be used to inform the identification of active travel proposals and this may include collecting relevant non-active travel data. For example, where an active travel proposal has been identified within an existing highway corridor, data relating to traffic flows, speeds and the number of HGVs should be collected to help identify whether on-road or off-carriageway interventions may be more appropriate. Further details on how traffic data can be used to help identify acceptable conditions for on-road cycling can be found in table 11.1.

16.2.4 The Welsh Government and other funders expect to see evidence of the impact of a scheme post implementation. The case for future funding and support during public consultation can be enhanced by evidence from a quantified (and qualitative) examination of usage.

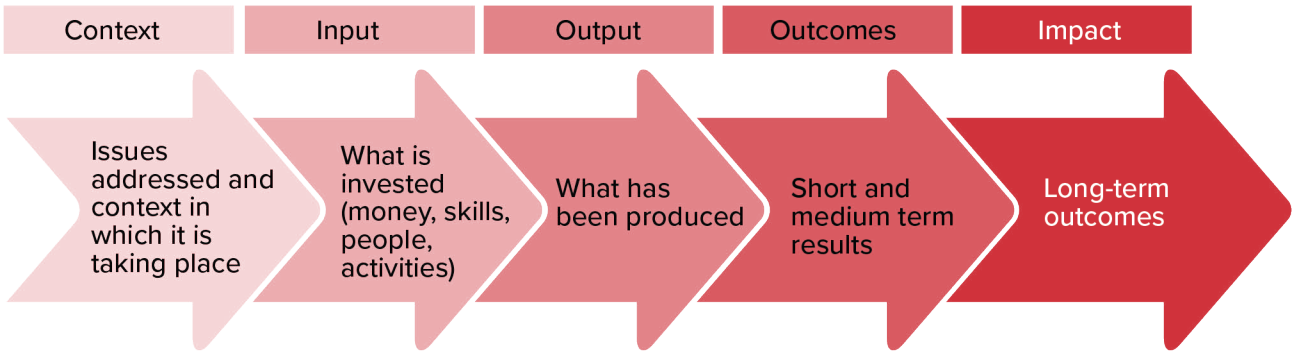
16.3 How to approach monitoring and evaluation

16.3.1 A monitoring and evaluation plan should be developed for all new active travel routes and schemes and the costs of this should be factored in when estimating costs for the overall project. The plan would typically be a variant of a logic map or logic framework (an example is given in figure 16.1) – a systematic and visual presentation of the key steps forming a monitoring programme based on the scheme objectives. Schemes will have both outputs and outcomes derived from the project objectives.

16.3.2 This requires the identification of:

- **SMART objectives** (Specific, Measurable, Achievable, Realistic and Timed).
- **inputs** – what is invested in the project. Examples include: money, skills, people, activities (such as training for people who walk and wheel and training for people who cycle).
- **outputs** – anything that is delivered from a project activity. These are usually quantitative. Examples include: number of participants in project activities, number of crossing points/ junctions improved, number of activities delivered, length of cycle route provided, number of champions recruited, etc.
- **outcomes** – the short to medium term results that is generated through the delivery of outputs. This is the change that is brought about through the delivery of the project activities such as increased walking, wheeling and cycling.
- **impacts** – the long-term results from the intervention such as reduced congestion and improved well-being.

Figure 16.1: Components of an intervention logic map



16.3.3 The information in table 16.1 below gives examples of a range of active travel outputs and outcomes.

16.3.4 Additional columns have been added to the basic logic map to capture information on how the authority plans to measure the impact of the project. This includes the indicator that will be used, the method of data collection and the frequency of data collection. The impact, indicator, method and frequency of measurement for each output or outcome should be entered on a new row in the table.

Table 16.1: Example of a simple logic map for active travel

What does the project aim to deliver?	What is the change you expect to see?	How do you plan to measure this change?
Objective: Enhanced accessibility. **Input:** Infrastructure improvements, barrier removal.	**Output:** Number of dropped kerbs delivered, barriers removed. **Outcome:** Improved accessible provision for users. **Impact:** Improved access for users. Increased access for all users, particularly disabled users. **Indicator:** Number of accessibility upgrades delivered. Positive feedback from disabled people using the route.	**Method:** Construction log, EqIA. User survey or perception survey or community survey. **Frequency:** Captured continuously, reported quarterly (for example, captured before and after delivery).
Objective: Improve provision for people walking and wheeling. **Input:** Pavement widening, signage improvements.	**Output:** Kilometres of pavement widened, number of signs installed, number of kerbs realigned/dropped. **Outcome:** Positive perceptions of walking and wheeling. **Impact:** Better public environments, increase in the number of people walking and wheeling. **Indicator:** Number of improvements delivered for people who walk and wheel; km of pavement upgraded. Positive feedback from people who walk or wheel or local community about changes.	**Method:** Construction log. Perception survey. **Frequency:** Before and after delivery. Continuously captured, reported quarterly.
Objective: Improve safety for people cycling. **Input:** Infrastructure improvements, resources.	**Output:** Physical route, signing. **Outcome:** Increased usage, improved perceptions of the route. **Impact:** Reduction in incidence of accidents, congestion reduction. Increase in cycling users, increase in diversity of cycling users, reduced health burden of accidents. **Indicator:** Number of accidents/reduced congestion. Positive feedback from people cycling and/or local community about changes.	**Method:** Accident logs/ automatic counts. User survey or perception survey. **Frequency:** Annually, quarterly, monthly. Before and after intervention delivery.

16.3.5 The monitoring and evaluation plan should consider the characteristics of the scheme or network in question. The data to be collected should directly address the intended outcomes and impacts, and should relate to what is on the ground, for example: is there a suitable location for an automatic counter on the route or network? Are there schools or workplaces that are served by the route or network where data can be collected by surveys and other methods?

16.3.6 Consideration should also be given to unintended consequences, such as the possibility that certain users may avoid a route following an intervention. It will not always be easy to ascertain, but good baseline data that identifies the existing level of use by type of user will enable an evaluation of changes in the mix of users.

16.3.7 Consideration should be given the timing of data collection across years for consistency, such as comparable months and weather patterns. This is very important for usage data as there is a natural curve of seasonal behaviour that changes throughout the year (increased walking, wheeling and cycling in warmer months, but less in winter months). Collecting perception data at differing months of the year is less problematic as this usage pattern is not such an influence. Further guidance on the data collection, including the most appropriate timings or approaches, is available from Transport for Wales.

16.3.8 The investment in data gathering needs to cost-effectively establish the outcomes and impacts. Cost can be a key constraint and the scaling of costs is not a simple formulaic matter. If a more detailed data set is required, costs are inevitably higher. A low-cost scheme may not necessarily correspond to a scheme with a minimal data requirement.

16.3.9 Examples of historic monitoring approaches have included circumstances where 1% of a multi-million pound investment has been spent on monitoring, and others where monitoring has amounted to a quarter of total project cost. This shows there is no specific proportion that can be used to determine a monitoring and evaluation budget. Rather, the monitoring and evaluation budget should be specific to each scheme and include the activities required to reasonably measure the impact of the planned active travel intervention.

16.3.10 Designs shall be informed by both current conditions and anticipated future demand. This includes consideration of planned development, mode shift aspirations, and longer-term changes in travel behaviour. Proposals should not be limited to existing levels of usage, but should enable and support future growth in walking, wheeling and cycling, ensuring infrastructure remains fit for purpose over its design life.

16.4 Data gathering tools

16.4.1 It is uncommon to collect data on walking and wheeling unless specific to a scheme, and the collection of data on cycling varies enormously both in consistency and extent. Most monitoring of walking, wheeling and cycling relates to levels of use, with less attention to patterns of use, type of user or user satisfaction.

16.4.2 A wide range of tools for data collection is available. These should be selected according to the information requirements identified to demonstrate the scheme objectives in the monitoring and evaluation plan. Some pertinent data might already be available from existing national or local datasets that could meet the project's needs before embarking on further data collection, such as traffic flows, air quality, speed data.

16.4.3 Table 16.2 lists common monitoring tools for active travel, indicative costs and their scale of application. Further information on monitoring tools for walking, wheeling and cycling schemes, including detail on indicative costs and their scale of application, can be found in the Monitoring and Evaluation Guidance Toolkit, available from TfW.

Table 16.2: Data collection methods available for monitoring

Tools	Key issues to consider
Automatic walking, wheeling, and cycling or motor vehicle traffic counts.	Initial investment costs are high due to hardware costs and there is an ongoing maintenance liability; extent of costs depends on number of counters required, and intensity of coverage required; costs can range from £1,500 to £5,000 per counter unit, depending on specification, but greater for complex locations. Ongoing maintenance costs are also a consideration but should be seen as part of the transport network monitoring.
Manual walking, wheeling, cycling and motor vehicle traffic counts, including cordon counts.	No hardware costs, but an ongoing cost in commissioning repeat counts; frequency and the number of points to be covered are the primary determinants of cost; payment usually for a standard day rate per count, day per site per iteration. Cordon counts are manual counts of users passing across a specified boundary such as a zone.
Video monitoring, including counts.	Video technology can capture (non-continuous) usage counts, and/or be used to monitor how infrastructure is used by the public. Data capture period is usually one week. Modest hardware and installation or commissioning costs. Can be resource-intensive to analyse; technology for automated analysis is developing.
Cycle parking counts.	Cost depends on area to be covered; payment usually for a standard day rate per person required, per iteration.
Beneficiary and participant count record and surveys.	Based on four days coverage per survey event, usually using two people per site; fieldwork cost varies by location and provider (approx. £2,000 – £7,000).
User surveys.	Can capture quantitative and qualitative data on travel behaviour and perceptions around a project. Targeted at specific beneficiary; data captured via household postal survey or via local community/ groups/schools/workplaces, etc. Cost varies by scope and audience. Social media and self-selected web-based surveys will not provide a representative sample, but can be useful tools to gather perception data. Qualitative data requires additional resource to analyse.
Perception survey (community/ household or other beneficiary).	Can capture quantitative and qualitative data on travel behaviour and perceptions around a project. Targeted at specific beneficiary; data captured by household postal survey or by local community/ groups/schools/workplaces, etc. Cost varies by scope and audience. Social media and self-selected web-based surveys will not provide a representative sample, but can be useful tools to gather perception data. Qualitative data requires additional resource to analyse.

Tools	Key issues to consider
Household travel behaviour survey.	Best suited to measuring travel behaviour change over time where an extensive programme of active travel interventions is being delivered. Usually very expensive for very strong data; survey design and sampling are part of the process, but the bulk of the cost is surveyor time; key cost determinants are level of coverage with respect to sample size and statistical surety; payment usually £40,000-90,000 per iteration; typical sample size required would be around 1000 households.
Interviews and focus groups.	Used to capture qualitative data from scheme beneficiaries, relevant if interventions are targeting benefits for a specific user group. Low-cost to capture and analyse if carried out at a reasonable scale.
Anonymous data collection methods, such as mobile apps or Bluetooth surveys.	Can provide a variety of data types on the volume and characteristics of journeys at specific points. This is a constantly evolving area although this type of technology can rely on movements across mobile phone tower reception boundaries to capture data.

16.5 Recommended approach

16.5.1 Table 16.3 provides a range of options and monitoring techniques that are available to local authorities when developing and delivering active travel schemes. To provide some consistency it is recommended that as a minimum the following elements are included as part of any monitoring and evaluation plan.

Table 16.3: Recommended minimum level for project development

When required	Tool	Monitoring outcome	Rationale	Timing and frequency
All infrastructure schemes expected to influence levels of walking and wheeling trips through new or improved provision.	Walk, wheel, and cycle counts. These could be manual or automatic (for example traditional cycle counters or video/AI equivalents).	Levels of active travel use.	To understand existing levels of active travel use and potential demand for interventions, before construction. Post-construction, to capture the realised levels of usage. Relevant to all infrastructure schemes expected to influence levels of walking, and wheeling trips through new or improved provision.	The surveys should be undertaken over 3 or 4 days, including both weekdays (ideally Tuesday to Thursday) and weekends. Best carried out in spring and autumn during neutral months March to June and September to November. Repeated annually at a comparable time of year for minimum of 3 years as part of post-completion monitoring.
To be used where a project is near to a school (within 2 miles for primary schools, 3 miles for secondary schools) and/ or expected to influence travel behaviour to/from a school.	Hands-up surveys, or travel tracker tools (a part of school travel plans, other interventions, or Public Health Wales' annual survey).	Mode of travel to school.	To understand travel patterns and behaviour associated with proposals based around schools.	Carried out during pre-design to capture existing travel pattern during the spring or autumn term (including the neutral months of April, May, June, September and October). Where available, data from the Public Health Wales hands-up survey is proposed to be collected during the 2nd or 3rd week in September. Repeated at least annually for a minimum of 3 years as part of post-completion.

When required	Tool	Monitoring outcome	Rationale	Timing and frequency
This will be relevant to all route and network proposals (not for minor works).	Community (or household) perception survey.	Stakeholder perceptions and expectations around an intervention. Can capture quantitative and qualitative data on travel behaviour.	**Pre-scheme:** To help understand user needs and aspirations, inform the scheme objectives and provide baseline data preconstruction. **Post scheme:** To provide evidence of impact of the intervention postconstruction. Should consider the relevant household or community area to include in data collection as being near to the scheme including whether any schools, activity clubs, community centres or local businesses should be targeted in the data collection.	Should be carried out during scheme development and repeated following completion of the project.
This will be relevant to all schemes.	User surveys.	Levels of active travel use, provides additional data relating to active travel journeys including wider benefits and can be used to validate automatic counts.	To provide a detailed measure of usage, including a count and additional information about the usage observed, specific to the location where the survey is carried out. A comparison of any pre-construction and post-construction user surveys will demonstrate an increase in usage. This will be relevant to any schemes expected to influence walking, wheeling and cycling usage through new or improved provision.	The surveys should be undertaken over 3 or 4 days, including both weekdays (ideally Tuesday to Thursday) and weekends. Best carried out in spring and autumn during neutral months March to June and September to November. Repeated annually at a comparable time of year for minimum of 2 years as part of post-completion monitoring (and then moving to a rolling programme of user surveys across the network on a rotational basis).

16.5.2 Where schemes connect to educational establishments or large employers, it may also be appropriate to undertake school or workplace travel surveys in addition to the methods identified above. This will allow for the collection of data relating to levels of active travel use and travel behaviour, as well as additional information regarding barriers to active travel and attitudes to health, air quality and the environment.

16.6 Analysis, results and outputs

16.6.1 The analysis should be planned at the stage of designing the data collection approach. It should be designed to assess progress towards the stated objectives of the scheme and consequent output requirements identified in the monitoring and evaluation plan.

16.6.2 Attributing an impact directly to a project or scheme, especially an area-wide intervention, can be complex as other factors are often at work. It is relatively easy to report on the usage of a short stretch of route if counter and/or user survey data is available. However, this approach can risk significantly underestimating usage on a more complex network due to the failure to account for the parts of the network not covered by data collection activity.

16.6.3 In response to this, anonymous data collection methods such as mobile apps or Bluetooth surveys are available. These go beyond traditional approaches and provide a variety of data types on the volume and characteristics of journeys at specific points. This data can then be used as a proxy for the usage on the surrounding area. It allows geographically distinct sources of data, collected on a network of routes, to be combined to estimate use across that network. This approach can generate a single annual usage estimate (broken down by user type) for a walking and wheeling or cycling infrastructure scheme for both pre and post (where data permits) scheme construction and options to include it at the early development stage should be considered as part of the plan.

16.6.4 Mobile network data can also be purchased from mobile network operators, as well as GPS data from a range of third party providers. These data sources are constantly improving and can increasingly be used for quantifying the volume of shorter distance active travel journeys. These data sources are more useful in the larger built-up areas where there would be a higher volume of people travelling. Transport for Wales is able to provide advice on using mobile phone data for quantifying travel demand.

16.6.5 The output from the analysis will need to be expressed clearly to communicate the findings to a range of stakeholders and its content and format should be determined at the outset in the monitoring and evaluation plan. Any analysis output should relate back to the specific intervention objectives and outcomes, providing evidence of how a scheme has achieved its intended purpose.

16.6.6 Options for data analysis might include:

- measures of levels or changes of walking, wheeling and cycling.
- measures of or change in:
    - levels of walking, wheeling and cycling among particular user groups.
    - levels of walking, wheeling and cycling by journey purpose.

- percentage mode shift from car to active modes on the route.
- safety and perceptions of safety.
- perceptions of facets of a route.
- health benefits associated with a route.
- carbon emissions savings and air quality benefits.

- benefit to cost ratio of a route.

16.6.7 Presentation of monitoring results should have regard to the target audiences and be accessible to them. Whilst a detailed analysis may be appropriate for a more technically minded audience, a more visual representation of key results will be more suited to others, including decision makers and the general public. The local authority's high level monitoring and evaluation framework that sits above individual scheme monitoring plans, will help determine what type of reports are best for particular audiences.

Figure 16.2: Example of monitoring results (Walk Wheel Cycle Trust)



16.6.8 Monitoring and Evaluation (M&E) support is available to practitioners via atmonitoring@tfw.wales. Transport for Wales is available to provide advice and support to practitioners in developing and delivering proportionate M&E approaches.

Practitioners should also refer to the Monitoring and Evaluating Walking, Wheeling and Cycling Schemes guidance and the Monitoring and Evaluation Guidance Toolkit, which provides advice on collecting robust baseline data and identifying the most up-to-date sources of information.

16.6.9 Data collection requirements should be considered and embedded from the earliest stages of scheme development.



Glossary of commonly used technical terms

Key term	Description
AADT (Annual Average Daily Traffic)	The average over a full year of the number of vehicles passing a point in the road network each day (2 way traffic).
Absolute value (minimum or maximum)	Values that should only be used if there are no viable alternatives and only for short sections. The use of these should be justified in the Design Decision Log (see appendix L). Any proposed infrastructure outside absolute values should seek a discussion with Welsh Government before it is proposed.
Accessible (transport)	Transport services and infrastructure that meet the relevant policy and regulatory standards on equality, access, human rights and the Welsh language, recognising the social model of disability.
Active Travel	Active travel is a term used to describe walking, wheeling and cycling for utility or purposeful journeys, as opposed to recreational walking, wheeling and cycling.
Active Travel (Wales) Act 2013	The legislation, unique to Wales, which places duties on local authorities and the Welsh Ministers with an aim to make walking and cycling the most natural and normal way of getting about. Abbreviated to 'the Act' within this document.
Active Travel Network Map (ATNM)	Active Travel Network Maps, introduced in the 2020 consultation draft of this guidance, combine the Existing Routes Map (ERM) and Integrated Network Map (INM) required by the Active Travel (Wales) Act. An ATNM consists of Existing Routes, Future Routes and Related Facilities.
Active Travel Route	A walking, wheeling and/or cycling route that enables utility journeys by connecting trip origins with destinations.
Audit (Route)	A systematic assessment of a walking, wheeling or cycle route, taking into account factors such as the infrastructure type, dimensions, condition, as well as contextual factors.
Basic Network	The basic network, also referred to as local network, refers to local quiet streets where observed low traffic speed, road design and low volumes of motor traffic make them suitable for walking and cycling, without need for designated cycling infrastructure.
Cyclist, or person cycling	The definition of a cyclist under the Act includes all users of a cycle.
Cycle (noun)	The term cycle includes all forms of bicycle, tricycle, or a cycle having four or more wheels, cycles with trailers, adapted cycles, including cargo and electric cycles, but not motorised vehicles.

Key term	Description
Cycle Lane (mandatory, advisory)	The term cycle lane has the meaning given in Schedule 1 of the Traffic Signs Regulations and General Directions (TSRGD). "part of a carriageway of a road reserved for pedal cycles which is separated from the rest of the carriageway". An advisory cycle lane is indicated by a broken white line and a mandatory cycle lane by a continuous white line.
Cycle Track	The term cycle track is used in its wider sense (rather than the legal definition) to describe routes for cycling within the highway boundary that are physically separated from motor vehicles and pedestrians, such as by a kerb, verge, level difference or material delineation (LTN 1/20).
Data Map Wales	Welsh Government digital mapping application which Local Authorities should use to record and submit their ERM/INM (now known as ATNM).
Designated Localities	Settlements defined by Direction by Welsh Ministers to which the Active Travel Act's mapping duties apply.
Desirable values (minimum or maximum)	Desirable values are the minimum (or maximum) level for best practice provision which should be provided whenever possible. Values outside of the desirable range should be justified in the Design Decision Log (see appendix L).
Existing Route	A term used in the Act. Refers to an active travel route that has been audited against a set of Welsh Government specified criteria and deemed suitable for walking and wheeling, cycling or both. Collectively they make up the Existing Routes layer of the ATNM.
Future Route	Previously known as Integrated Network Map routes, Future Routes are either routes that do not yet exist, or routes that fall short of the threshold to be classified as an existing route and require improvement. Collectively they make up the future routes layer of the ATNM.
Highways Authorities	Have a duty to assert and protect the rights of the public to use and enjoy any highway for which they are an authority. As Highways Authority for the motorway and trunk road network in Wales, Welsh Ministers must maintain them at public expense and comply with other regulations.
Infrastructure	Transport infrastructure includes all the things that enable transport services to operate – streets and roads, railway lines and active travel networks such as cycle-paths and footpaths. It also includes associated structures such as stations, bridges, embankments, car parks, signage, signalling, bus stops and transport interchanges and the soft estate – land and green-space associated with transport.
Low Traffic	There is no firm definition of low motor traffic volumes, but up to 2500 motor vehicles per day is a typical cut off in an urban setting.
Low Traffic Neighbourhood (LTN)	Or healthy neighbourhood, is an area usually still open to motor traffic access, but where through traffic is greatly reduced via measures such as planters, bollards, or one-way motor traffic flows.

Key term	Description
Mesh Network Density	If a settlement is imagined as a grid this analysis allows the number of routes to be measured within a 1km square. It is the Welsh Government's aim to achieve a mesh density of cycling routes in designated settlements of approximately 250 metres.
Modal Filter	A modal filter restricts the type of vehicle that can use a through-route, often a simple measure used in residential areas that can enable a more pleasant street environment, whilst retaining residential and emergency vehicular access.
Modal Shift	In the context of this guidance, modal shift refers to where a journey undertaken by another mode of transport (such as private car) is replaced with another mode such as walking, wheeling or cycling.
Primary/Follow-me position	The position centre of carriageway which cyclists should adopt in certain circumstances when interacting with vehicular traffic. See National Standards of Cycle Training/Bikeability for a full explanation.
Propensity	In the context of this guidance, propensity refers to the potential untapped usage of an active travel route or related facility.
Public Right of Way (or PRoW)	A route over which users have a right to roam in accordance with the designation of the right of way. These comprise footpaths, bridleways, restricted byways and byways open to all traffic. All public rights of way are highways and are shown on the Definitive Map held by local highway authorities, which is required to be constantly reviewed and updated.
Related Facility	These are (usually publicly accessible) installations for use by people walking, wheeling and cycling. These include for example parking and storage for cycles, toilets and washing facilities, seating, as well as signage.
Route Classification	Primary routes: The key connections between neighbourhoods/ residential areas and a town or city centre; routes between districts and neighbourhoods; links to main public transport interchanges; other walking, wheeling and/or cycling routes which are (or which have the potential to be) used by many people. Secondary routes: The links between the primary routes; links to trip attractors such as schools, colleges, employment sites; routes which are an attractor for a more limited range of users; links to local public transport interchanges and stops; other routes which may cater for fewer walking, wheeling and/or cycling journeys than the primary routes but are still of strategic importance within the network. Local routes: All-purpose roads, greenways and bridleways that are not necessarily part of a designated route (for example many residential streets). This basic network of local routes, although lower in the hierarchy, forms an important part of the active travel network.
Separated	A route where people walking, wheeling, cycling and motor traffic all use physically separated, often adjacent, alignments (such as footway, cycle track and carriageway).

Key term	Description
Sustainable Transport Hierarchy	Guides decisions about new infrastructure and gives priority to walking, wheeling and cycling and public transport, followed by ultra low emission vehicles and finally private motor vehicles. It is set out in Planning Policy Wales (PPW) (see figure 3.3).
Utility Journey	A journey made for the purpose of getting to a destination. For example to go to or return from work, to school, access a service or a leisure destination, make a visit, or go shopping.
Transport for Wales (TfW)	The body established by Welsh Government to deliver transport priorities in Wales.
Walker (or Pedestrian, or person walking and wheeling)	The term "walker" (or pedestrian) includes those who travel by foot (walking or running) and users of wheelchairs or other mobility aids. Somebody using an electric wheelchair, mobility scooter, or similar vehicle would also be considered a walker or pedestrian, rather than a motorised travel user.
WelTAG	A framework for assessing the impact and benefits of proposed transport interventions such as schemes to upgrade roads. It is aligned with the seven national well-being goals.
85th percentile speed	The speed at or below which 85% of vehicles are traveling.



Appendix A: Powers and duties created by the Active Travel (Wales) Act 2013

Powers of local authorities

S.2(1)(b)	Power to determine whether a route is appropriate for active travel.
S.3(10)(b)	Power to revise the existing routes map without requiring submission to the Welsh Ministers.
S.4(2)	Power to determine what infrastructure is required to develop or enhance the active travel network.

Duties on local authorities

S.2(6)	Duty to take certain factors and guidance into account when determining whether a route is appropriate for active travel.
S.3(1)	Duty to prepare an existing route map and submit it to the Welsh Ministers for approval.
S.3(3)	Duty to consult on the existing routes maps.
S.3(4)	Duty to have regard to guidance on preparing and consulting on the existing routes map.
S.3(5)	Duty to submit existing routes map within a fixed timescale.
S.3(6)	Duty to submit a statement and explanation of standards of routes on the existing routes map to the Welsh Ministers.
S.3(7)	Duty to submit a report on the changes in level of use of active travel infrastructure whenever re-submitting the existing routes map for approval (only applies after the first map).
S.3(10)(a)-(c)	Duty to keep the existing routes map under review, and to resubmit it for approval every time the integrated network map (now the ATNM) is submitted for approval.
S.4(1)	Duty to prepare an integrated network map and submit it to the Welsh Ministers for approval.
S.4(3)	Duty to consult on the integrated network map.
S.4(4)	Duty to consider the desirability of active travel whilst preparing the integrated network map.
S.4(5)	Duty to have regard to guidance on preparing and consulting on the integrated network map.
S.4(6)	Duty to submit integrated network map within a fixed timescale.
S.4(9)(a)-(c)	Duty to keep the integrated network map under review, and to resubmit it for approval every 3 years.
S.5(1)-(3)	Duty to publish maps and the statement and explanation.
S.5(2)	Duty to have regard to guidance on publishing maps.
S.6	Duty to have regard for the integrated network map when preparing local transport plans.
S.7(1)	Duty to make continuous improvement to active travel routes and facilities.
S.7(2)	Duty to have regard to guidance on continuous improvement.
S.7(3)	Duty to report to Welsh Ministers on costs incurred while making continuous improvement.

S.9(1)	Duty to take reasonable steps to enhance active travel provision while exercising certain functions under the Highways Act 1980.
S.9(2)	Duty to have regard to the needs of walkers and cyclists while exercising certain traffic management functions.
S.10(1)	Duty to exercise functions under this Act in a way that promotes active travel and secures more active travel infrastructure.
S.10(2)	Duty to make a report on Welsh Ministers on what the local authority has done to meet their duty under s.10(1).
S.10A(4)	Power to revise a statement about the steps they propose to take to promote active travel as a way of reducing or limiting air pollution at any time.
S.10B(1)	Duty to promote active travel as a way of reducing or limiting air pollution in their areas.
S.10B(1)(2)	Duty to take steps to promote as a way of reducing or limiting air pollution and to report on these steps when it submits an integrated network map.
S.10B(2)	Duty to submit a report alongside each ATNM submission specifying the steps taken by the local authority to perform it's duty under S.10B(1).
S.10B(3a)(3b)	Power to make regulations which impose a duty on any devolved Welsh public authority to take steps to promote active travel as a way of reducing or limiting air pollution and to publish reports on these steps.
S.10C(4)	Duty to have regard to any guidance issued by Welsh Ministers in relation to meeting their duty under S.10.B.
S.10C(4)	Duty to have regard to guidance in performing duties to promote active travel as a way of reducing or limiting air pollution.

Powers of Welsh Ministers

S.2(4)	Power to make a Direction on designated localities.
S.2(6)	Power to issue guidance on whether a route is appropriate for active travel.
S.2(9)	Power to issue guidance on related facilities.
S.3(4)	Power to issue guidance on preparing and consulting on the existing route map.
S.3(5)	Power to vary timescales for the submission of the existing route map by direction.
S.3(8)	Power to require local authority to revise and resubmit an existing routes map if they decide not to approve it.
S.3(5)	Power to issue guidance on preparing and consulting on the integrated network map.
S.4(6)(b))	Power to vary timescales for the submission of the integrated network map by direction.
S.4(7)	Power to require local authority to revise and resubmit an integrated network map if they decide not to approve it.
S.4(10)	Power to vary timescales for the submission of the integrated network map by direction.
S.5(2)	Power to issue guidance on publishing the maps.
S.7(2)	Power to issue guidance on continuous improvement.
S.12(1)	Power to vary or revoke guidance and directions issued under this Act.
S.14	Power to commence Act by Order.

As part of amendments through the Environment (Air Quality and Soundscapes) (Wales) Act

S.10A(1)	Duty to promote AT as a way of reducing or limited air pollution.
S.10A(2)	Duty to publish a statement about steps to be taken to meet duty in S.10(1).
S.10A(3)	Duty to publish the statement as soon as possible after coming into force and keep it under review.
S.10A(5)	Duty to publish a report every 3 years from the date of coming into force of this section specifying what steps have been taken.
S.10B(5)	Duty to consult with any public authority required to promote AT and report on steps to fulfill that requirement.
S.10C(1-2)	Duty to give guidance to local authorities and public authority's about their performance of their duties.
S.10C(3)	Duty to consult with authority or authorities, and any other person considered appropriate, prior to giving or revising guidance.
S.10B(3)(a-b)	Powers to impost a duty on any public authority specified in regulation, to take steps to promote active travel as a way of reducing or limited air pollution and publish reports on the steps taken to fulfill that duty.

Duties of Welsh Ministers

S.3(9)	Duty to consider certain factors in deciding whether to approve the existing routes maps.
S.4(8)	Duty to consider certain factors in deciding whether to approve the integrated network maps.
S.8	Duty to make and publish annual reports on extent of active travel journeys in Wales.
S.9(1)	Duty to take reasonable steps to enhance active travel provision while exercising certain functions under the Highways Act 1980.
S.9(2)	Duty to have regard to the needs of walkers and cyclists while exercising certain traffic management functions.
S.10(1)	Duty to exercise functions under this Act in a way that promotes active travel and secures more active travel infrastructure.
S.10A(1)(2)(3)(5)	Duty to take steps to promote as a way of reducing or limiting air pollution, to publish a statement about the steps they propose to take and to report on these steps every three years.
S.10B(5)	Duty to consult any devolved Welsh public authority about the proposal to extend the duty to promote active travel as a way of reducing or limiting air pollution to that authority.
S.10C(3)(a-b)	Duty to consult any authority to which guidance to promote active travel as a way of reducing or limiting air pollution relates, and any other persons considered appropriate, before guidance is given or revised.
S.10C(1)(2)	Duty to give guidance to local authorities about promoting active travel as a way of reducing or limiting air pollution, and to also give guidance to other public authorities if the promotion duty is extended to them.
S.11	Duty to make full review of the Act 5 years after the publication of the first integrated network map.
S.12(2)	Duty to have regard to the desirability of active travel when varying or revoking direction and guidance.

Appendix B: Direction designating localities under the Active Travel Act

Active Travel (Wales) Act 2013

To all county and county borough councils in Wales.

Direction designating localities in relation to active travel routes.

The Welsh Ministers, in exercise of the powers conferred on them by section 2(4) and (5) of the Active Travel (Wales) Act 2013 ("the Act"), make the following Direction.

Statutory background

Whilst we directly quote other acts/legislation etc. and use the term walking & cycling, in this guidance we now use a more inclusive term 'walking, wheeling and cycling'.

Section 2(1) of the Act provides that for the purposes of the Act a route in a local authority's area is an active travel route if:

a. the route is situated in a designated locality in the area.

b. the local authority considers that it is appropriate for it to be regarded as an active travel route.

Section 2(4) of the Act provides that, in the Act, "designated", in relation to a locality, means specified, or of a description specified, in a direction given by the Welsh Ministers.

Section 2(5) provides that the Welsh Ministers may, in particular, specify a locality, or description of a locality, by reference to:

a. density of the population.

b. size.

c. proximity to densely populated localities above a particular size.

d. position between such localities.

e. proximity to community services and facilities.

f. potential for other reasons to be a locality, or a description of locality, in which more travel is undertaken by walkers and cyclists by active travel journeys.

The direction

In exercise of the above powers under the Act, the Welsh Ministers direct that the designated localities for the purposes of the Act are those localities within Wales specified in the schedule below under the heading 'designated locality'. The table below sets out which cities, towns and villages are included in the designated locality (where the designated locality covers multiple settlements), the population of the designated locality, and the local authorities with responsibility for that designated locality. Shaded darker grey indicates that the designated localities run across local authority boundaries, shaded orange means they fall within a single local authority area.

The designated localities are derived from the Office for National Statistics' built up areas. The built-up areas are identified by splitting Wales into 50 metre by 50 metre squares. The predominant land use in each square is identified as either built up or not built up (containing buildings and similar infrastructure, or empty of development). Where built up squares sit next to each other, then they are amalgamated into larger built up areas.

If settlements are within 200 metres of each other, then they were linked together into a single 'built up area'. Many of these built up areas are amalgamations of a number of towns and villages, which are in close proximity to each other and/or to a larger densely populated area. This approach reflects the actual pattern of development, rather than the administrative boundary divisions between settlements.

The designated localities have been named with reference to the largest town or city within the locality, but many stretch beyond the administrative boundaries of that named town or city. Where the shaded areas on the map extend beyond the administrative boundaries of the named town or city, local authorities should follow the boundaries shaded on the map.

The determination of 'built up areas' derives from 2021 census data.

Local authorities are not required to include on their ATNM areas in England adjacent to their boundaries.

Table B.1: Locality by settlement, population, and corresponding local authority

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Cardiff (runs across local authority boundaries)	**Caerphilly, Cardiff, Dinas Powys, Penarth, Pontypridd, Taff's Well**	**447,287**	**Caerphilly County Borough Council, The City of Cardiff Council, Vale of Glamorgan Council, Rhondda Cynon Taf County Borough Council**
Cardiff	Caerphilly	41,402	Caerphilly County Borough Council
Cardiff	Cardiff	335,145	The City of Cardiff Council
Cardiff	Dinas Powys	7,490	Vale of Glamorgan Council
Cardiff	Penarth	27,226	Vale of Glamorgan Council
Cardiff	Pontypridd	30,457	Rhondda Cynon Taf County Borough Council
Cardiff	Fynnon Taf	5,567	The City of Cardiff Council and Rhondda Cynon Taf County Borough Council
Newport (Runs across local authority boundaries)	**Aberbargoed, Abercarn, Abersychan, Bargoed, Blackwood, Cwmbrân**	**306,844**	**Caerphilly County Borough Council, Torfaen County Borough Council and Newport City Council**
Newport	Aberbargoed	994	Caerphilly County Borough Council
Newport	Abercarn	5,352	Caerphilly County Borough Council
Newport	Abersychan	7,573	Torfaen County Borough Council
Newport	Bargoed	11,537	Caerphilly County Borough Council
Newport	Blackwood	24,042	Caerphilly County Borough Council
Newport	Cwmbrân	46,915	Torfaen County Borough Council
Newport	Newbridge	9,590	Caerphilly County Borough Council
Newport	Newport	128,060	Newport City Council
Newport	Pontllanfraith	9,220	Caerphilly County Borough Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Newport	Pontypool	28,334	Torfaen County Borough Council
Newport	Risca	14,958	Caerphilly County Borough Council
Newport	Wattsville	1,065	Caerphilly County Borough Council
Newport	Ystrad Mynach	19,204	Caerphilly County Borough Council
Swansea (Runs across local authority boundaries)	**Glais, Gowerton, Neath, Pontardawe, Port Talbot, Swansea, Upper Killay, Ystradgynlais**	**300,352**	**City and County of Swansea Council, Neath Port Talbot County Borough Council, Powys County Council**
Swansea	Glais	838	City and County of Swansea Council
Swansea	Gowerton	8,183	City and County of Swansea Council
Swansea	Neath	50,658	Neath Port Talbot County Borough Council
Swansea	Pontardawe	12,333	Neath Port Talbot County Borough Council
Swansea	Port Talbot	37,276	Neath Port Talbot County Borough Council
Swansea	Swansea	179,485	City and County of Swansea Council
Swansea	Upper Killay	1,331	City and County of Swansea Council
Swansea	Ystradgynlais	10,248	Powys County Council
Wrexham (Single local authority area)	**Bradley, Rhostyllen, Wrexham**	**65,692**	**Wrexham County Borough Council**
Wrexham	Bradley	1,323	Wrexham County Borough Council
Wrexham	Rhostyllen	2,766	Wrexham County Borough Council
Wrexham	Wrexham	61,603	Wrexham County Borough Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Buckley (Single local authority area)	**Buckley, Connah's Quay, Deeside Industrial Park, Northop Hall, Sandycroft, Shotton**	**63,576**	**Flintshire County Council**
Buckley	Buckley	19,639	Flintshire County Council
Buckley	Connah's Quay	16,774	Flintshire County Council
Buckley	Deeside Industrial Park	2,134	Flintshire County Council
Buckley	Northop Hall	1,530	Flintshire County Council
Buckley	Sandycroft	6,724	Flintshire County Council
Buckley	Shotton	16,775	Flintshire County Council
Tonypandy (Single local authority area)	**Porth, Rhondda, Tonypandy, Treherbert, Treorchy, Tylorstown**	**62,545**	**Rhondda Cynon Taf County Borough Council**
Tonypandy	Porth	14,648	Rhondda Cynon Taf County Borough Council
Tonypandy	Rhondda	13,333	Rhondda Cynon Taf County Borough Council
Tonypandy	Tonypandy	17,789	Rhondda Cynon Taf County Borough Council
Tonypandy	Treherbert	5,440	Rhondda Cynon Taf County Borough Council
Tonypandy	Treorchy	7,694	Rhondda Cynon Taf County Borough Council
Tonypandy	Tylorstown	3,641	Rhondda Cynon Taf County Borough Council
Bridgend (Single local authority area)	**Bridgend, Sarn, Trelales**	**58,380**	**Bridgend County Borough Council**
Bridgend	Bridgend	46757	Bridgend County Borough Council
Bridgend	Sarn	10,805	Bridgend County Borough Council
Bridgend	Trelales	818	Bridgend County Borough Council
Barry (Single local authority area)	**Barry**	**54,673**	**Vale of Glamorgan Council**

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Llanelli (Single local authority area)	**Llanelli, Llangennech, Pwll**	**49,591**	**Carmarthenshire County Council**
Llanelli	Llanelli	43,878	Carmarthenshire County Council
Llanelli	Llangennech	4,324	Carmarthenshire County Council
Llanelli	Pwll	1,389	Carmarthenshire County Council
Rhyl/Prestatyn (Single local authority area)	**Dyserth, Meliden, Prestatyn, Rhyl**	**46,267**	**Denbighshire County Council**
Rhyl/Prestatyn	Dyserth	2,269	Denbighshire County Council
Rhyl/Prestatyn	Meliden	2,066	Denbighshire County Council
Rhyl/Prestatyn	Prestatyn	16,783	Denbighshire County Council
Rhyl/Prestatyn	Rhyl	25,149	Denbighshire County Council
Merthyr Tydfil (Single local authority area)	**Merthyr Tydfil**	**43,820**	**Merthyr Tydfil County Borough Council**
Colwyn Bay (Single local authority area)	**Colwyn Bay, Penrhyn Bay, Penrhyn-side**	**34,284**	**Conwy County Borough Council**
Colwyn Bay	Colwyn Bay	29,405	Conwy County Borough Council
Colwyn Bay	Penrhyn Bay	4,432	Conwy County Borough Council
Colwyn Bay	Penrhyn-side	447	Conwy County Borough Council
Ebbw Vale (Single local authority area)	**Blaina, Brynmawr, Ebbw Vale, Nantyglo**	**33,068**	**Blaenau Gwent County Borough Council**
Ebbw Vale	Blaina	4,808	Blaenau Gwent County Borough Council
Ebbw Vale	Brynmawr	5,530	Blaenau Gwent County Borough Council
Ebbw Vale	Ebbw Vale	18,095	Blaenau Gwent County Borough Council
Ebbw Vale	Nantyglo	4,635	Blaenau Gwent County Borough Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Aberdare (Single local authority area)	**Aberdare, Fernhill**	**31,135**	**Rhondda Cynon Taf County Borough Council**
Aberdare	Aberdare	29,748	Rhondda Cynon Taf County Borough Council
Aberdare	Fernhill	1,387	Rhondda Cynon Taf County Borough Council
Flint (Single local authority area)	**Flint, Gorsedd, Holywell, Walwen**	**26,442**	**Flintshire County Council**
Flint	Flint	14,907	Flintshire County Council
Flint	Gorsedd	391	Flintshire County Council
Flint	Holywell	9,808	Flintshire County Council
Flint	Walwen	1,336	Flintshire County Council
Rhosllanerchrugog (Runs across local authority boundaries)	**Cefn-mawr, Rhosllanerchrugog, Ruabon, Trevor**	**25,362**	**Wrexham County Borough Council and Denbighshire County Council**
Rhosllanerchrugog	Cefn-mawr	7,051	Wrexham County Borough Council
Rhosllanerchrugog	Rhosllanerchrugog	13,501	Wrexham County Borough Council
Rhosllanerchrugog	Ruabon	3,357	Wrexham County Borough Council
Rhosllanerchrugog	Trevor	1,453	Wrexham County Borough Council and Denbighshire County Council
Ammanford (Single local authority area)	**Ammanford, Pen-y-groes, Penybanc, Saron**	**23,709**	**Carmarthenshire County Council**
Ammanford	Ammanford	**7,945**	Carmarthenshire County Council
Ammanford	Pen-y-groes	**5,717**	Carmarthenshire County Council
Ammanford	Penybanc	**1,126**	Carmarthenshire County Council
Ammanford	Saron	**867**	Carmarthenshire County Council
Ammanford	Tumble	4,302	Carmarthenshire County Council
Ammanford	Tycroes	3,752	Carmarthenshire County Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Church Village (Single local authority area)	**Beddau, Church Village, Efail Isaf**	**23,277**	**Rhondda Cynon Taf County Borough Council**
Church Village	Beddau	8,236	Rhondda Cynon Taf County Borough Council
Church Village	Church Village	13,783	Rhondda Cynon Taf County Borough Council
Church Village	Efail Isaf	1,258	Rhondda Cynon Taf County Borough Council
Maesteg (Runs across local authority boundaries)	**Croeserw, Cymmer, Maesteg**	**21,001**	**Neath Port Talbot County Borough Council and Bridgend County Borough Council**
Maesteg	Croeserw	1,569	Neath Port Talbot County Borough Council and Bridgend County Borough Council
Maesteg	Cymmer	544	Neath Port Talbot County Borough Council
Maesteg	Maesteg	18,888	Bridgend County Borough Council
Gorseinon (Single local authority area)	**Gorseinon, Loughor**	**20,581**	**City and County of Swansea Council**
Gorseinon	Gorseinon	15,757	City and County of Swansea Council
Gorseinon	Loughor	4,824	City and County of Swansea Council
Aberystwyth (Single local authority area)	**Aberystwyth**	**18,749**	**Ceredigion County Council**
Aberystwyth	Aberystwyth	18,093	Ceredigion County Council
Aberystwyth	Llanbadarn Fawr	656	Ceredigion County Council
Kinmel Bay/ Abergele (Single local authority area)	**Abergele, Kinmel Bay**	**18,705**	**Conwy County Borough Council**
Kinmel Bay/Abergele	Abergele	9,208	Conwy County Borough Council
Kinmel Bay/Abergele	Kinmel Bay	9,497	Conwy County Borough Council
Bangor (Single local authority area)	**Bangor**	**17,988**	**Cyngor Gwynedd**
Chepstow (Single local authority area)	**Chepstow**	**16,169**	**Monmouthshire County Council**

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Carmarthen (Single local authority area)	**Carmarthen**	**15,854**	**Carmarthenshire County Council**
Porthcawl (Single local authority area)	**Porthcawl**	**15,672**	**Bridgend County Borough Council**
Llandudno (Single local authority area)	**Llandudno**	**15,371**	**Conwy County Borough Council**
Tredegar (Single local authority area)	**Tredegar**	**14,855**	**Blaenau Gwent County Borough Council**
Abergavenny (Single local authority area)	**Abergavenny, Llanfoist**	**14,651**	**Monmouthshire County Council**
Abergavenny	Abergavenny	13,423	Monmouthshire County Council
Abergavenny	Llanfoist	1,228	Monmouthshire County Council
Haverfordwest (Single local authority area)	**Haverfordwest**	**14,596**	**Pembrokeshire County Council**
Llantrisant (Single local authority area)	**Brynsadler, Llantrisant**	**14,422**	**Rhondda Cynon Taf County Borough Council**
Llantrisant	Brynsadler	1,158	Rhondda Cynon Taf County Borough Council
Llantrisant	Llantrisant	13,264	Rhondda Cynon Taf County Borough Council
Llantwit Major (Single local authority area)	**Llanmaes, Llantwit Major**	**14,384**	**Vale of Glamorgan Council**
Llantwit Major	Llanmaes	403	Vale of Glamorgan Council
Llantwit Major	Llantwit Major	8,427	Vale of Glamorgan Council
Pyle (Single local authority area)	**Pyle**	**13,701**	**Bridgend County Borough Council**
Milford Haven (Single local authority area)	**Milford Haven**	**13,582**	**Pembrokeshire County Council**
Treharris (Runs across local authority boundaries)	**Nelson, Treharris**	**13,352**	**Merthyr Tydfil County Borough Council and Caerphilly County Borough Council**
Treharris	Nelson	4,647	Caerphilly County Borough Council
Treharris	Treharris	7,705	Merthyr Tydfil County Borough Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Holyhead (Single local authority area)	Holyhead	11,431	Isle of Anglesey County Council
Newtown (Single local authority area)	Newtown	11,357	Powys County Council
Mountain Ash (Single local authority area)	Mountain Ash	11,230	Rhondda Cynon Taf County Borough Council
Caldicot (Single local authority area)	Caldicot	11,200	Monmouthshire County Council
Llandudno Junction (Single local authority area)	Bryn Pydew, Llandudno Junction	11,109	Conwy County Borough Council
Llandudno Junction	Bryn Pydew	451	Conwy County Borough Council
Llandudno Junction	Llandudno Junction	10,658	Conwy County Borough Council
Abertillery (Single local authority area)	Abertillery	10,946	Blaenau Gwent County Borough Council
Monmouth (Single local authority area)	Monmouth	10,110	Monmouthshire County Council
Mold (Single local authority area)	Mold	10,058	Flintshire County Council
Pembroke Dock (Single local authority area)	Pembroke Dock	9,753	Pembrokeshire County Council
Caernarfon (Single local authority area)	Caethro, Caernarfon	9,730	Cyngor Gwynedd
Caernarfon	Caethro	237	Cyngor Gwynedd
Caernarfon	Caernarfon	9,493	Cyngor Gwynedd
Tonyrefail (Single local authority area)	Tonyrefail	9,317	Rhondda Cynon Taf County Borough Council
Pencoed (Single local authority area)	Pencoed	9,166	Bridgend County Borough Council
Pontarddulais (Runs across local authority boundaries)	Pontarddulais	9,073	City and County of Swansea Council and Carmarthenshire County Council
Caerleon (Runs across local authority boundaries)	Caerleon	8,747	Newport City Council and Torfaen County Borough Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Rhymney (Single local authority area)	**Pontlottyn, Rhymney**	**8,537**	**Caerphilly, County Borough Council**
Rhymney	Pontlottyn	1,924	Caerphilly County Borough Council
Rhymney	Rhymney	5,151	Caerphilly County Borough Council
Denbigh (Single local authority area)	**Denbigh**	**8,514**	**Denbighshire County Council**
Burry Port (Single local authority area)	**Burry Port, Pembrey**	**8,310**	**Carmarthenshire County Council**
Burry Port	Burry Port	6,156	Carmarthenshire County Council
Burry Port	Pembrey	2,154	Carmarthenshire County Council
Brecon (Single local authority area)	**Brecon**	**8,250**	**Powys County Council**
Pembroke (Single local authority area)	**Pembroke**	**7,552**	**Pembrokeshire County Council**
Ferndale (Single local authority area)	**Ferndale**	**7,338**	**Rhondda Cynon Taf County Borough Council**
Hirwaun (Single local authority area)	**Hirwaun**	**7,247**	**Rhondda Cynon Taf County Borough Council**
Brynna/Llanharan (Single local authority area)	**Brynna/Llanharan**	**6,686**	**Rhondda Cynon Taf County Borough Council**
Abertridwr (Single local authority area)	**Abertridwr**	**6,504**	**Caerphilly County Borough Council**
Rhoose (Single local authority area)	**Rhoose**	**6,160**	**Vale of Glamorgan Council**
Abercynon (Single local authority area)	**Abercynon**	**5,983**	**Rhondda Cynon Taf County Borough Council**
Broughton (Single local authority area)	**Broughton**	**5,974**	**Flintshire County Council**
Welshpool (Single local authority area)	**Welshpool**	**5,948**	**Powys County Council**
Undy/Magor (Single local authority area)	**Undy/Magor**	**5,914**	**Monmouthshire County Council**
Coedpoeth (Single local authority area)	**Coedpoeth**	**5,723**	**Wrexham County Borough Council**

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Gwaen-Cae-Gurwen/Brynamman (Runs across local authority boundaries)	**Brynamman, Gwan-Cae-Gurwen**	**5,692**	**Neath Port Talbot County Borough Council and Carmarthenshire County Council**
Gwaen-Cae-Gurwen/Brynamman	Brynamman	2,608	Carmarthenshire County Council and Neath Port Talbot County Borough Council
Gwaen-Cae-Gurwen/Brynamman	Gwaun-Cae-Gurwen	3,084	Neath Port Talbot County Borough Council and Carmarthenshire County Council
Blaenavon (Single local authority area)	**Blaenavon**	**5,647**	**Torfaen County Borough Council**
Ogmore Vale/Nant-y-moel (Single local authority area)	**Nant-y-moel, Ogmore Vale**	**5,461**	**Bridgend County Borough Council**
Ogmore Vale/Nant-y-moel	Nant-y-moel	2,344	Bridgend County Borough Council
Ogmore Vale/Nant-y-moel	Ogmore Vale	3,117	Bridgend County Borough Council
Ruthin (Single local authority area)	**Ruthin**	**5,461**	**Denbighshire County Council**
Glynneath (Single local authority area)	**Glynneath**	**5,419**	**Neath Port Talbot County Borough Council**
Glynneath	Blaengwrach	1,141	Neath Port Talbot County Borough Council
Glynneath	Glynneath	4,278	Neath Port Talbot County Borough Council
Cwmavon (Single local authority area)	**Cwmavon**	**5,336**	**Neath Port Talbot County Borough Council**
Llandrindod Wells (Single local authority area)	**Llandrindod Wells**	**5,309**	**Powys County Council**
Cardigan (Runs across local authority boundaries)	**Cardigan, St Dogmaels**	**5,301**	**Pembrokeshire County Council and Ceredigion County Council**
Cardigan	Cardigan	4,184	Ceredigion County Council
Cardigan	St Dogmaels	1,117	Pembrokeshire County Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Gresford (Single local authority area)	**Gresford**	**5,010**	**Wrexham County Borough Council**
Menai Bridge (Single local authority area)	**Menai Bridge**	**4,958**	**Isle of Anglesey County Council**
Llangefni (Single local authority area)	**Llangefni**	**4,864**	**Isle of Anglesey County Council**
Bethesda (Single local authority area)	**Bethesda**	**4,735**	**Cyngor Gwynedd**
Bethesda	Bethesda	3,799	Cyngor Gwynedd
Bethesda	Rachub	936	Cyngor Gwynedd
Hope (Runs across local authority boundaries)	**Hope, Sydallt**	**4,706**	**Flintshire County Council and Wrexham County Borough Council**
Hope	Hope	4,284	Flintshire County Council
Hope	Sydallt	422	Wrexham County Borough Council
Tenby (Single local authority area)	**Tenby**	**4,696**	**Pembrokeshire County Council**
Llay (Single local authority area)	**Llay**	**4,681**	**Wrexham County Borough Council**
Hendreforgan/ Gilfach Goch (Runs across local authority boundaries)	**Gilfach Goch, Hendreforgan**	**4,395**	**Rhondda Cynon Taf County Borough Council and Bridgend County Borough Council**
Hendreforgan/ Gilfach Goch	Gilfach Goch	1,920	Rhondda Cynon Taf County Borough Council and Bridgend County Borough Council
Hendreforgan/ Gilfach Goch	Hendreforgan	2,475	Rhondda Cynon Taf County Borough Council
Glanaman (Runs across local authority boundaries)	**Glanaman**	**4,384**	**Carmarthenshire County Council and Neath Port Talbot County Borough Council**
Pontycymer (Single local authority area)	**Pontycymer**	**4,288**	**Bridgend County Borough Council**
New Tredegar (Single local authority area)	**New Tredegar**	**4,208**	**Caerphilly County Borough Council**

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Pwllheli (Single local authority area)	Pwllheli	4,076	Cyngor Gwynedd
Glyncoch (Single local authority area)	Glyncoch	4,020	Rhondda Cynon Taf County Borough Council
Chirk (Single local authority area)	Chirk	4,007	Wrexham County Borough Council
Conwy (Single local authority area)	Conwy	3,873	Conwy County Borough Council
Cowbridge (Single local authority area)	Cowbridge	3,804	Vale of Glamorgan Council
Llanbradach (Single local authority area)	Llanbradach	3,746	Caerphilly County Borough Council
Rhuddlan (Single local authority area)	Rhuddlan	3,709	Denbighshire County Council
Neyland (Single local authority area)	Neyland	3,708	Pembrokeshire County Council
Blaenau Ffestiniog (Single local authority area)	Blaenau Ffestiniog	3,662	Cyngor Gwynedd
Llanfairfechan (Single local authority area)	Llanfairfechan	3,637	Conwy County Borough Council
Penyffordd (Single local authority area)	Penyffordd	3,554	Flintshire County Council
Aberfan (Single local authority area)	Aberfan	3,547	Merthyr Tydfil County Borough Council
Ynysybwl (Single local authority area)	Ynysybwl	3,503	Rhondda Cynon Taf County Borough Council
Murton (Single local authority area)	Murton	3,500	City and Council of Swansea Council
Llangollen (Single local authority area)	Llangollen	3,466	Denbighshire County Council
Fishguard (Single local authority area)	Fishguard	3,400	Pembrokeshire County Council
Saundersfoot (Single local authority area)	New Hedges, Saundersfoot	3,361	Pembrokeshire County Council
Saundersfoot	New Hedges	594	Pembrokeshire County Council
Saundersfoot	Saundersfoot	2,767	Pembrokeshire County Council

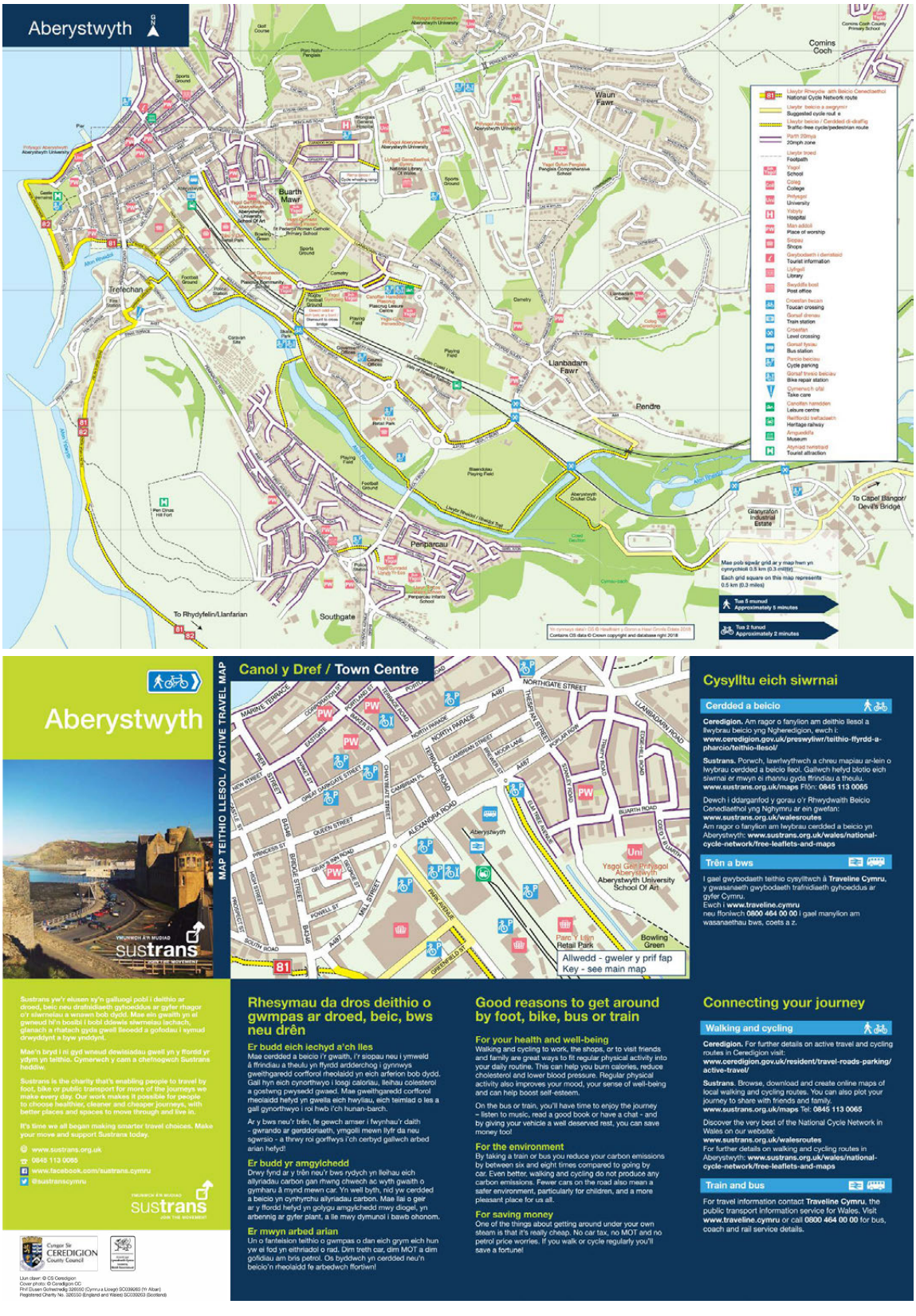
Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
St Asaph (Single local authority area)	St Asaph	3,355	Denbighshire County Council
Llanrwst (Single local authority area)	Llanrwst	3,323	Conwy County Borough Council
Amlwch (Single local authority area)	Amlwch	3,211	Isle of Anglesey County Council
Llanfairpwllgwyngyll (Single local authority area)	Llanfairpwllgwyngyll	3,107	Isle of Anglesey County Council
Tywyn (Single local authority area)	Tywyn	3,097	Cyngor Gwynedd
Marshfield (Single local authority area)	Castleton, Marshfield	3,054	Newport City Council
Marshfield	Castleton	735	Newport City Council
Marshfield	Marshfield	2,319	Newport City Council
Llanharry (Runs across local authority boundaries)	Llanharry	3,035	Rhondda Cynon Taf County Borough Council and Vale of Glamorgan Council
Knighton (Single local authority area)	Knighton	3,007	Powys County Council
Llanhilleth (Runs across local authority boundaries)	Llanhilleth	2,990	Blaenau Gwent County Borough Council and Caerphilly County Borough Council
Porthmadog (Single local authority area)	Porthmadog	2,981	Cyngor Gwynedd
Lampeter (Single local authority area)	Lampeter	2,970	Ceredigion County Council
Llanidloes (Single local authority area)	Llanidloes	2,929	Powys County Council
Usk (Single local authority area)	Usk	2,834	Monmouthshire County Council
Builth Wells/ Llanelwedd (Single local authority area)	Builth Wells/ Llanelwedd	2,834	Powys County Council
Llandybie (Single local authority area)	Llandybie	2,813	Carmarthenshire County Council
Kidwelly (Single local authority area)	Kidwelly	2,782	Carmarthenshire County Council

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Cwm (Single local authority area)	**Cwm**	**2,739**	**Blaenau Gwent County Borough Council**
Dolgellau (Single local authority area)	**Dolgellau**	**2,688**	**Cyngor Gwynedd**
Llanddulas/Mynydd Marian (Single local authority area)	**Llanddulas, Llysfaen, Mynydd Marian**	**2,674**	**Conwy County Borough Council**
Llanddulas/Mynydd Marian	Llanddulas	1,268	Conwy County Borough Council
Llanddulas/Mynydd Marian	Llysfaen	330	Conwy County Borough Council
Llanddulas/Mynydd Marian	Mynydd Marian	1,076	Conwy County Borough Council
St Clears (Single local authority area)	**Pwll-trap, St Clears**	**2,663**	**Carmarthenshire County Council**
St Clears	Pwll-trap	674	Carmarthenshire County Council
St Clears	St Clears	1,989	Carmarthenshire County Council
Penmaenmawr (Single local authority area)	**Penmaenmawr**	**2,535**	**Conwy County Borough Council**
Creigiau (Single local authority area)	**Creigiau**	**2,380**	**The City of Cardiff Council**
Machen (Single local authority area)	**Machen**	**2,362**	**Caerphilly County Borough Council**
Valley (Single local authority area)	**Valley**	**2,361**	**Isle of Anglesey County Council**
Cwmfelinfach/ Ynysddu (Single local authority area)	**Cwmfelinfach, Ynysddu**	**2,342**	**Caerphilly County Borough Council**
Cwmfelinfach/ Ynysddu	Cwmfelinfach	1,383	Caerphilly County Borough Council
Cwmfelinfach/ Ynysddu	Ynysddu	959	Caerphilly County Borough Council
Barmouth (Single local authority area)	**Barmouth**	**2,315**	**Cyngor Gwynedd**
Pentyrch (Single local authority area)	**Pentyrch**	**2,287**	**The City of Cardiff Council**
Y Felinheli (Single local authority area)	**Y Felinheli**	**2,284**	**Cyngor Gwynedd**

Designated locality	Settlements	Population	Local authority with responsibility for settlements within the designated locality
Leeswood (Single local authority area)	Leeswood	2,282	Flintshire County Council
Rossett (Single local authority area)	Rossett	2,279	Wrexham County Borough Council
Narberth (Single local authority area)	Narberth	2,265	Pembrokeshire County Council
Gilwern (Single local authority area)	Gilwern	2,263	Monmouthshire County Council
Bettws (Single local authority area)	Bettws	2,253	Newport City Council
Benllech (Single local authority area)	Benllech	2,236	Isle of Anglesey County Council
Machynlleth (Single local authority area)	Machynlleth	2,235	Powys County Council
Seven Sisters (Single local authority area)	Seven Sisters	2,123	Neath Port Talbot County Borough Council
Tanyfron (Single local authority area)	Tanyfron	2,090	Wrexham County Borough Council
Resolven (Single local authority area)	Resolven	2,068	Neath Port Talbot County Borough Council
Llandovery (Single local authority area)	Llandovery	2,068	Carmarthenshire County Council
Crickhowell (Single local authority area)	Crickhowell	2,063	Powys County Council
Presteigne (Single local authority area)	Presteigne	2,056	Powys County Council
Southgate (Single local authority area)	Southgate	2,004	City and County of Swansea Council

Appendix C: Aberystwyth Map

We are grateful to Walk Wheel Cycle Trust Cymru and Ceredigion County Council for permission to reproduce this map.



Appendix D: Model engagement report

Model engagement report

This report must be submitted to Welsh Government with the authority's draft ERM/INM (now known as ATNM). An electronic version of the report can be downloaded from: https://www.gov.wales/active-travel-act-guidance-model-engagement-report-appendix-d If the information is held in a different format that may be submitted instead of using this form.

Figure D.1: Introductory part of the engagement report

In total, how many engagement events did you organise?	How many people attended?
How were the events advertised?	
Have you established a group with which you engage in regular discussion on active travel issues including network planning? If yes, please give a brief description.	

Engagement with specific categories of the population

For each category please give a brief description of how the engagement took place how many people were involved, the names of organisations involved and at which stage of the process the engagement occurred (such as regular, ongoing engagement, pre-draft ATNM, formal consultation period).

Figure D.2: Engagement with specific categories of the population

Category engaged with	Number of people engaged	Organisation invlolved	Stage of the process
People who do not currently travel actively			
Description of the engagement			
Blind and partially sighted people and their organisations			
Description of the engagement			
Other local authority departments and adjoining local authorities			
Description of the engagement			
Young people (including school students)			
Description of the engagement			
People who had requested that they be consulted			
Description of the engagement			
Walking and cycling organisations			
Description of the engagement			

Category engaged with	Number of people engaged	Organisation invlolved	Stage of the process
Town and Community Councils (where present)			
Description of the engagement			
Other public bodies, including health organisations			
Description of the engagement			
Elected members			
Description of the engagement			
Others (such as large employers or other stakeholders)			
Description of the engagement			

Figure D.3: Submission

Name of local authority:			
Contact official:		Date submitted:	

Note: Consultation on the ATNM does not replace any statutory requirements for consultation and engagement that is required as part of an individual scheme (see chapter 5).

Appendix E: Example ATNMs

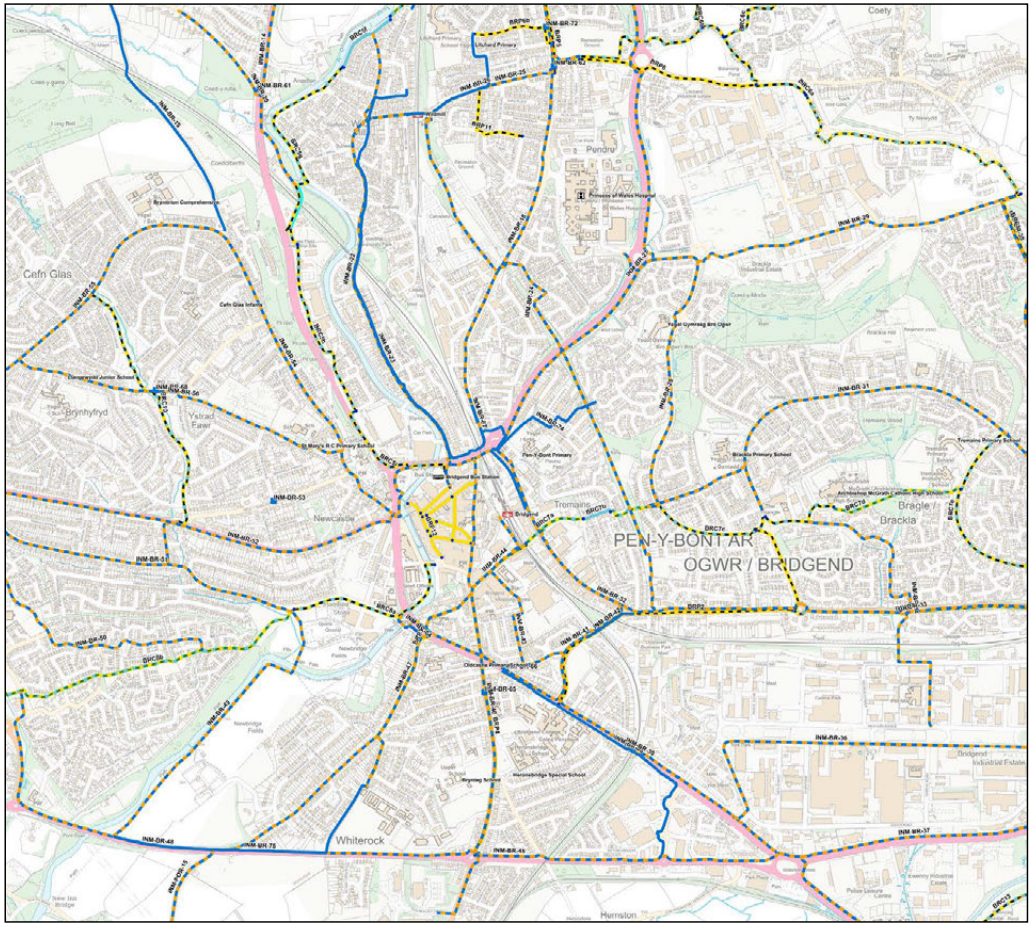
The following plans provide examples of ATNMs from different local authorities, as follows:

Figure E.1: Bridgend – an example of an approved ATNM from the 2017 submission

Bridgend Town Active Travel Network Plan (Scale 1:14,000)

Produced by the Active Travel web site. Gynhyrchwyd gan y wefan Teithio Llesol.

Bridgend County Borough Council
Civic Offices
Angel Street
Bridgend, CF31 4WB



Legend / Eglurhad

Active Travel Routes / Llwybrau Teithio Llesol

- Undefined path design / Dyluniad llwybr heb ei ddiffinio
- Footpath (away from road) / Llwybr troed (i ffwrdd o'r ffordd)
- Footway (alongside road) / Troedffordd (ochr yn ochr â ffordd)
- Cycle track (away from road) / Trac beicio (i ffwrdd o'r ffordd)
- Cycle track (alongside road) / Trac beicio (ochr yn ochr â ffordd)
- Shared use foot/cycle path (away from road) / Llwybr cerdded/beicio a rennir (i ffwrdd o'r ffordd)
- Shared use foot/cycle path (alongside road) / Llwybr cerdded/beicio a rennir (ochr yn ochr â ffordd)
- Segregated foot/cycle path (away from road) / Llwybr cerdded/beicio wedi'i wahanu (i ffwrdd o'r ffordd)
- Segregated foot/cycle path (alongside road) / Llwybr cerdded/beicio wedi'i wahanu (ochr yn ochr â ffordd)
- Cycle route (on road, not segregated) / Lôn feicio (ar y ffordd, heb ei gwahanu)
- Cycle lane (on road, segregated) / Lôn feicio (ar y ffordd, wedi'i gwahanu)
- Pedestrian zone / Ardal cerdded
- Pedestrian and cycle zone / Ardal cerdded a beicio
- Road without footway / Ffordd heb droedffordd

- Line end points / Pwyntiau diwedd llinell
- Integrated Network Walking
- Integrated Network Cycling
- Integrated Network Shared Use
- Cycle Network / Rhwydwaith Beicio

Landmarks / Tirnodau

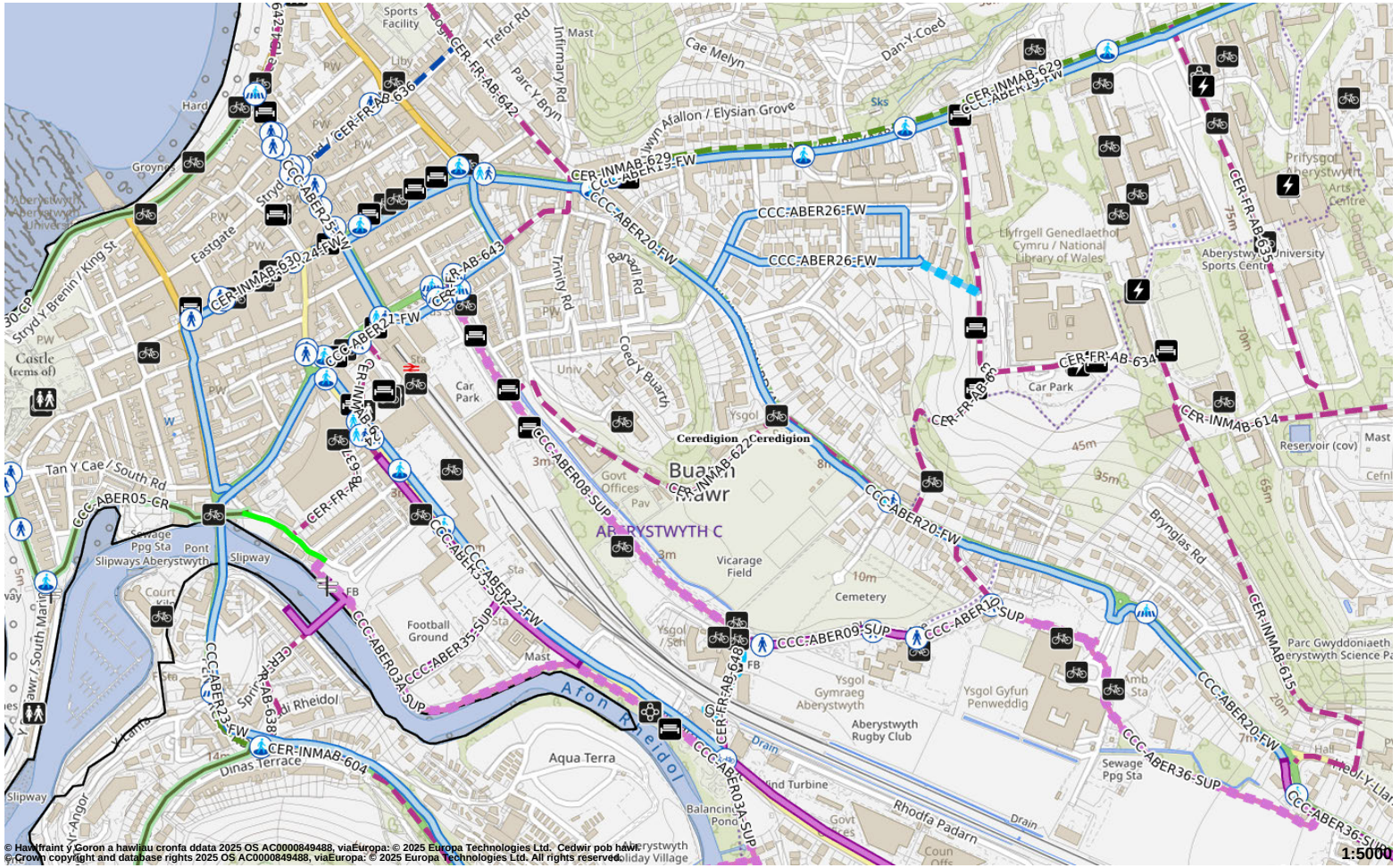
- Bus Station / Gorsaf Fysus
- Hospital / Ysbyty
- Railway Station / Gorsaf Reilffordd
- Schools / Ysgolion
- Labels / Labeli

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Llywodraeth Cymru
Welsh Government

30 Jul 2019 10:38 AM

Figure E.2: Aberystwyth ATNM example, August 2025. Map taken from DataMapWales



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31/07/2025

Appendix F: Annual report

To the Welsh Ministers,

Active Travel (Wales) Act 2013 Reporting Duties

In accordance with the duties under sections 7 (3) and 10 (2) of the Active Travel (Wales) Act 2013, please find [insert local authority name]'s annual report for the year 2023-24.

Figure F.1: Actions taken and costs incurred to promote and improve active travel

Information request	Actions taken/costs incurred
The actions taken to promote active travel journeys	[insert actions taken by the various local authority departments; such as information provision, work undertaken with schools and other organisations, signage, active travel challenges and competitions, events, etc]
The actions taken to secure new active travel routes and related facilities and improvements	[insert actions taken by the various local authority departments; such as directly funded or grant funded construction and improvement of routes and facilities, those negotiated as part of planning processes, support given to third parties, etc]
Costs incurred for new active travel routes and facilities and improvements of existing active travel routes and related facilities carried out in the preceding full financial year	[insert spend]

In addition to the above, the following information provides an overview of infrastructure that has been implemented during the previous year:

Figure F.2: Infrastructure delivery and third-party investment in active travel

Information request	Actions taken/costs incurred
Indicative spending for new active travel routes and facilities and improvements of existing active travel routes and related facilities funded or part funded by third parties	[insert indicative spend and source of funding]
Length of new routes for walking, wheeling, cycling and shared use	[provide separate lengths (in metres) of new (a) walking/wheeling, (b) cycling and (c) shared-use routes] a. b. c.
Length of improved routes for walking, wheeling, cycling and shared use	[Provide separate lengths (in metres) of improved (a) walking/wheeling, (b) cycling and (c) shared-use routes] a. b. c.
New and improved active travel facilities	[insert number and type of new and improved active travel facilities, for example cycle parking, toilets, seating along active travel routes]

Additional information (optional).

I confirm that this report will be published online and made available in hard copy on request, in accordance with the statutory Active Travel Act Guidance (2026 edition).

Chief Executive Signature:

Chief Executive Name:

Date of submission to Welsh Ministers

Report to accompany the ATNM submission

The data available will vary between authorities, therefore the template gives examples for the type of data that can be used.

To the Welsh Ministers,

Active Travel (Wales) Act 2013 Reporting Duties

In accordance with the duties under section 3 (7) of the Active Travel (Wales) Act 2013, please find below [insert local authority name]'s report on the level of use of active travel routes.

Figure F.3: Usage and baseline data for existing active travel routes

Information request	Actions taken/costs incurred
Number of existing Active Travel Routes	Insert number and length (if known) of existing active travel routes in your authority: • Walking and wheeling • Cycling • Shared use
Baseline data at 2016	Insert original levels of active travel in your authority, for example: • Number of trips recorded • Percentage of children walking, wheeling or cycling to school • Percentage of travel to work trips by walking, wheeling or cycling • Percentage of people making active travel journeys • If specific data is available for existing active travel routes, please indicate which routes and their usage levels

Information request	Actions taken/costs incurred
What data was available in your local authority to record usage?	For example: • automated counts • manual counts • Active Journeys data or other school travel surveys • workplace or visitor travel surveys • census data • national survey data • anything else that may be available locally
New data at [insert reporting year]	Insert current levels of active travel in your authority, for example: • Number of trips recorded • Number of children walking, wheeling or cycling to school • Percentage of active travel as a mode of transport • Indicate existing active travel route(s) if specific is available as a comparison against baseline data
What data will be available to support the next iteration of this report?	Insert anticipated methods such as counters on new routes

(Please adapt the template to suit your requirements).

I confirm that this report will be published online and made available in hard copy on request, in accordance with the statutory Active Travel Act Guidance (2026 edition).

Chief Executive Signature:

Chief Executive Name:

Date of submission to Welsh Ministers

Appendix G: List of Design Elements

1. These Design Elements (DEs) provide concise guidance, including dimensioned drawings where appropriate, on the layout and use of particular types of design solution. These DEs should be read in conjunction with chapter 9, chapter 11 and chapter 12.

2. The drawings and images provided are illustrative and will not cover all circumstances. They should be applied in the light of local context. Where appropriate, references are given to other documents that will provide relevant advice, but readers should ensure that any such documents are the current editions.

At the top right corner of each Design Element, a small table shows the maximum 85th percentile speed and the Annual Average Daily Traffic (AADT) recommended for that specific arrangement. These are a guide only, and individual locations should be assessed on a case by case basis. For more information, see chapter 11 and chapter 12, table 11.1, table 12.1, figure 11.1 and figure 11.29.

The terms ‘absolute minimum’ (or “maximum”) and ‘desirable minimum’ (or “maximum”) are used throughout the details. Desirable values are the minimum level for best practice provision which should be provided whenever possible. Absolute values should only be used if there are no viable alternatives and only for short sections (for example a small section being narrowed at a bridge, tree or building). However, designers should keep in mind the importance of continuity; meaning it may be acceptable in exceptional circumstances to provide a small portion of route that is sub-standard in order to provide a continuous route. In all cases, the designer should keep an audit trail of decisions made to justify why the best practice level of provision cannot be provided, please refer to appendix L. Any project team considering infrastructure outside absolute values should seek a discussion with Welsh Government and TfW Active Travel Hub before it is proposed.

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DE101 Footway

Measure and brief description

Footways provide routes for people walking and wheeling alongside carriageways. A satisfactory footway of sufficient width is important to allow people walking or wheeling to travel at their chosen speed and to pass one another safely. Footway widths may be increased by reallocating road space away from motor vehicles to people walking and wheeling or increasing the usable width by removing street clutter. Footway provision for people who walk and wheel is contingent on a range of factors including the local context, static pedestrian activities such as seating, bus stops or congregation near tourist attractions, crossing types, significant trip generators such as schools and workplaces, street clutter, or pavement parking (see **section 11.17**).

Benefits

- Provision of direct and safe movement space for people to walk and wheel alongside carriageways and cycle tracks.

Key design features

- Surface materials should be even, firm and slip resistant in wet and dry conditions.
- Surface materials and layouts should be consistent in colour and tone, with good contrast between walking and wheeling routes, cycle tracks, and carriageways.
- Manhole covers and service hatches should match surrounding material pavers and pavement treatments.
- Rest areas should be provided on a regular basis.
- Footways should normally be lit by the overall highway lighting system.

Dimensions[1]

- Should ideally be level with a desirable maximum longitudinal gradient of 5% (1 in 20) (see section 9.7).
- Absolute maximum longitudinal gradient of 8% (1 in 12.5).
- Cambers and crossfalls should preferably be 2.5% (1 in 40) and should not exceed 3.3% (1 in 30) and an absolute maximum of 10% (1 in 10) at crossings.
- Footways will normally be separated from carriageways by a kerb. The desirable minimum kerb height is 60mm, which can be reliably detected by a blind or partially sighted person.
- Minimum obstacle-free footway widths (a) are shown below. Where it is expected that there will be high volumes of people walking and wheeling, widths should be increased accordingly – see guidance on the dimensions for walking and wheeling routes in section 9.6.

1 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Table G.1: Recommended widths for footways

Provision	a – Footway width (m)	Width can accommodate
Desirable minimum	2.0	Two wheelchairs, large electric mobility scooters, or double buggies passing comfortably.
Accepted minimum	1.8	Two wheelchairs passing each other, one person walking passing a wheelchair or double buggy comfortably.
Absolute minimum	1.5	A person walking passing a wheelchair or a double buggy.
Restricted width at immovable object	1.2	Provides space for a wheelchair, a double buggy, or for a blind or partially sighted person to walk using a long cane, or with a guide dog, or alongside a person providing guidance.

- Width should be increased to 3.5m if the space is frequently used by groups (see figure 9.11).
- On roads with an 85th percentile speed of 33mph or above, or with over 1,500 HGVs AADT, it is desirable to allow an additional minimum of 0.5m of footway or verge width to allow for vehicle overhang and 'kerb shyness' of people walking and wheeling (see section 9.19). There may also be a dead area of up to 0.5m at the back of the footway where the footway is bounded by a vertical feature such as a wall, or by the entrances to buildings (see section 9.6).
- Minimum headroom (b):
    - Desirable minimum – 2.3m.
    - Absolute minimum to isolated obstacles (such as signs) – 2.1m.

Other considerations

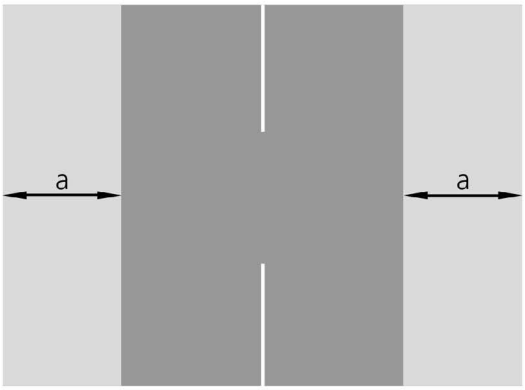
- Footways should be free of obstructions, with street furniture restricted to items which benefit people who walk or wheel. These should be located in a street furniture zone out of the flow of walking and wheeling traffic.
- Wherever possible, lamp columns and other street furniture should be set back at least 0.5m from the edge of the footway.
- Hazard protection (a detectable object, such as tapping rail or similar, with a minimum height of 150mm to underside):
    - At isolated objects, such as advertising boards, that cause an occasional narrowing of a footway, but which project no more than 100mm from their base do not need hazard protection.
    - Where the base of the projection is less than 300mm above ground level, no hazard protection is required.
    - Where an object projects more than 100mm within a zone between 300mm and 2.1 metres above ground level hazard protection should be provided. See BS8300 and Inclusive Mobility for further details.

- At crossing points and at side-road junctions the appropriate tactile paving should be provided.

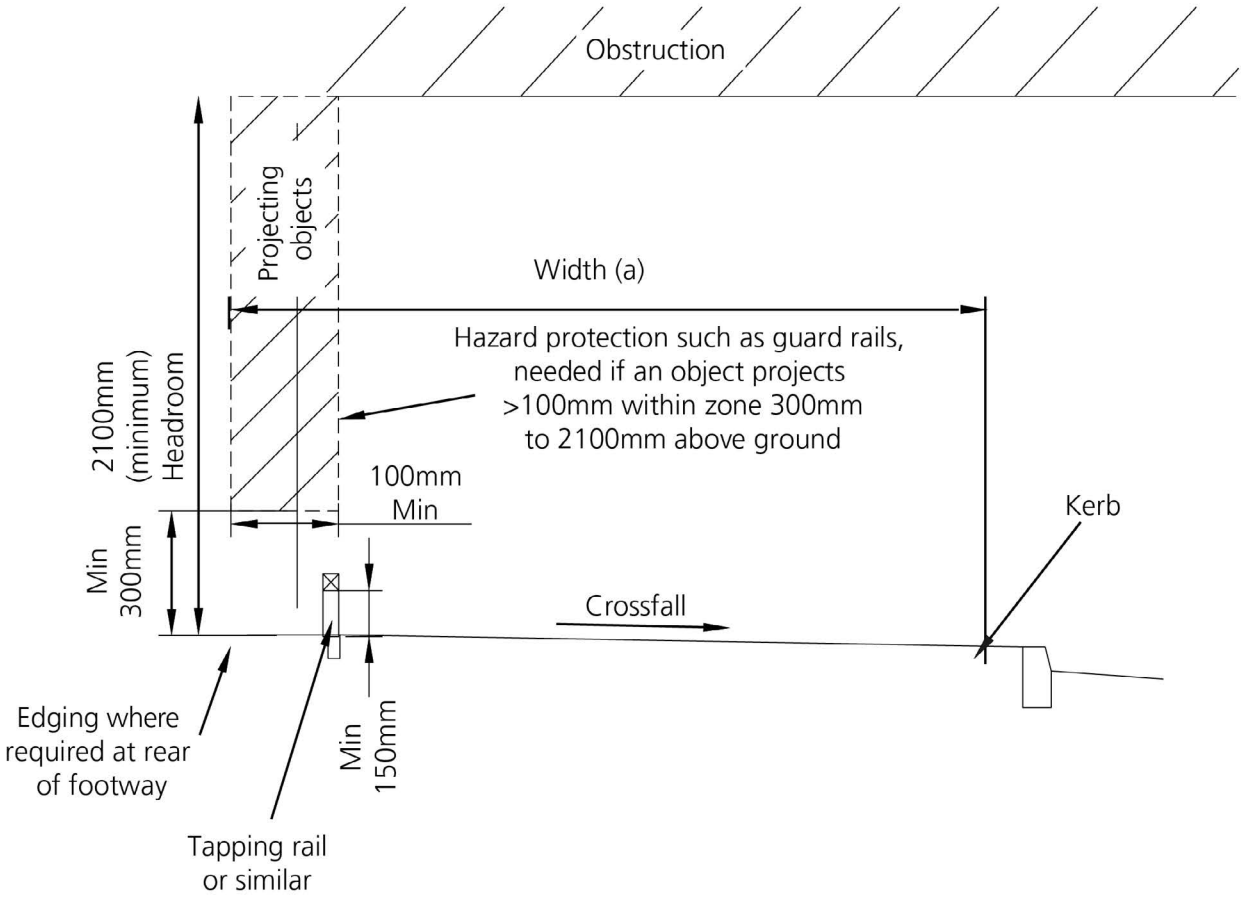
Further references

- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Department for Transport – Inclusive Mobility.
- Department for Transport – Manual for Streets.
- BS 8300-1:2018 Design of an accessible and inclusive built environment. External environment – code of practice.

DE101	Footway	**AADT:** N/A **85th percentile speed:** N/A



Plan



Cross section

Llywodraeth Cymru Welsh Government	DE number: DE101	Previous DE number: DE101
	Do Not Scale Drawing	Revision number: 3
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DE102 Footpath

Measure and brief description

Footpaths provide separate direct routes for people to walk and wheel for journeys in a range of locations such as through housing developments or across open space and countryside. A satisfactory footpath of sufficient width is important to allow people walking and wheeling to travel at their chosen speed and to pass one another safely (see **section 11.17**).

Benefits

- Provision of direct and safe movement of people walking and wheeling typically linking footways.

Key design features

- Surface materials should be even, firm and slip resistant in wet and dry conditions.
- Surface materials and layouts should be consistent in colour and tone, with good contrast between the footpath and any cycle track.
- Manhole covers and service hatches should be flush with surface materials.
- Rest areas should be provided on a regular basis.
- Footpaths should be lit where users might otherwise be discouraged from using the route outside daylight hours.

Dimensions[2]

- Should ideally be level with a desirable maximum longitudinal gradient of 5% (1 in 20) (see section 9.7).
- Absolute maximum longitudinal gradient of 8% (1 in 12.5).
- Cambers and crossfalls should preferably be 2.5% (1 in 40) and should not exceed 3.3% (1 in 30) and an absolute maximum of 10% (1 in 10) at crossings.
- Minimum obstacle-free footpath widths (a) are shown below. Where it is expected that there will be high volumes of people walking and wheeling, widths should be increased accordingly – see guidance on the dimensions for walking and wheeling routes in section 9.6.

2 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Table G.2: Recommended widths for footpaths

Provision	a – Footway width (m)	Width can accommodate
Desirable minimum	2.0	Two wheelchairs, large electric mobility scooters, or double buggies passing comfortably.
Accepted minimum	1.8	Two wheelchairs passing each other, one person walking passing a wheelchair or double buggy comfortably.
Absolute minimum	1.5	A person walking passing a wheelchair or a double buggy.
Restricted width at immovable object	1.2	Provides space for a wheelchair, a double buggy, or for a blind or partially sighted person to walk using a long cane, or with a guide dog, or alongside a person providing guidance.

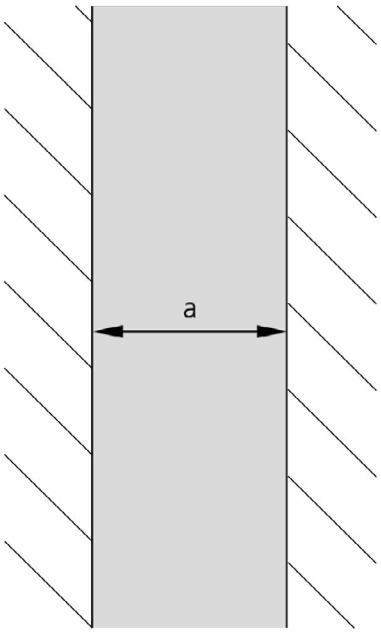
Other considerations

- Footpaths should be free of obstructions, with street furniture restricted to items which benefit people who walk and wheel. These should be located in a street furniture zone out of the flow of walking and wheeling traffic.
- Wherever possible lamp columns and other street furniture should be set back at least 0.5m from the edge of the footpath.
- Hazard protection (a detectable object, such as tapping rail or similar, with a minimum height 150mm to underside):
    - At isolated objects, such as advertising boards, that cause an occasional narrowing of a footway, but which project no more than 100mm from their base do not need hazard protection.
    - Where the base of the projection is less than 300mm above ground level, no hazard protection is required.
    - Where an object projects more than 100mm within a zone between 300mm and 2.1 metres above ground level hazard protection should be provided. See BS8300 for further details.

Further references

- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Department for Transport – Inclusive Mobility.
- BS 8300-1:2018 Design of an accessible and inclusive built environment. External environment – code of practice.
- Highways Act 1980.

DE102	Footpath	**AADT:** N/A **85th percentile speed:** N/A



Footpath

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DE103 Ramp

Measure and brief description

Ramps (defined as a gradient of more than 5% (1 in 20)) are provided to facilitate a change in level or grade on a walking or wheeling route. They should only be used where a change in level or grade cannot be avoided. In many places ramps will provide the alternative access to stairs for wheelchair users.

The details below refer to walking and wheeling routes, with the gradients on cycle routes covered in **section 9.15**. A number of the considerations below should be included in the design process of shared use paths and cycle tracks including maximum gradients, the provision of handrails, landings or rest areas and no sudden changes in direction (see **section 11.18**).

Benefits

- Ramps provide an accessible alternative to steps for disabled people, older people and parents and carers with buggies.

Key design features

- Where the change in level is no more than 200mm a ramp may be used without alternative steps.
- Desirable Maximum Gradient – 5% (1 in 20).
- Absolute Maximum Gradient – 8% (1 in 12). Steeper ramps will cause difficulties for manual wheelchair users.
- Absolute Maximum Gradient over short distances (max 1m) – 10% (1 in 10) – for example on a ramp between a bus entrance and the pavement.

Dimensions[3]

- Ramp surface width:
    - Desirable Minimum – 2m.
    - Acceptable Minimum – 1.8m.
    - Absolute Minimum – 1.5m.
- Sides of a ramp should be protected by a raised solid kerb at least 100mm in height.

3 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- If kerb height exceeds 75mm there must be no slot or gap greater than 20mm in the range of 75mm to 150mm. This is done to avoid the possibility of the footplate of a wheelchair riding over the kerb or becoming trapped.
- Ramp-side face of the kerb to be flush with, or no more than 100mm away from the ramp-side face of the handrail.
- Handrails should be provided on each side, with a minimum clear width rail to rail of 1200mm. Where this unobstructed width exceeds 2000mm, a central, continuous handrail may be used as an alternative to a handrail on each side.
- Recommended height to the top of the principal handrail is between 900mm and 1000mm above the pitchline of the steps or above the surface of the ramp. On landings the top of the handrail should be between 900mm and 1100mm from the surface.
- Handrails should continue beyond the end of the ramp slope or end of the stairs by a (minimum) distance of 300mm and should either return to the wall or down to the floor or have a minimum rounded downturn of 100mm.
- Second, lower handrails for children and people of restricted growth are helpful and should be at heights of between 550mm and 650mm.
- The handrail itself should be smooth and comfortable to use and warm to touch by people with arthritic hands, that is it should not be too small in diameter. Circular handrails should have a diameter between 40mm and 50mm; if not circular the handrail should be a maximum of 50mm wide by 38mm deep with rounded edges (radius of at least 15mm).
- There should be a clear space between the handrail and any adjacent wall of at least 50mm, preferably 60mm. Handrails should be supported centrally on the underside so there is no obstruction to the passage of the hand along the rail. There should also be a minimum of 600mm clear space above the handrail.

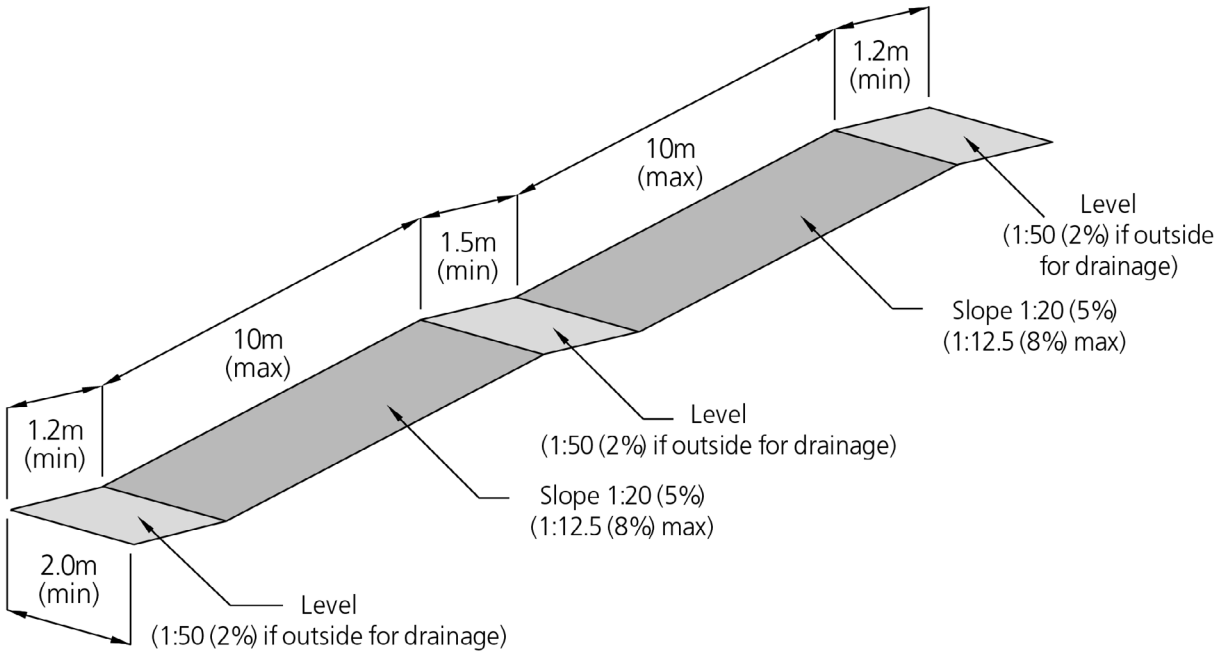
Other considerations

- There is a relationship between the length of a ramp and the gradient that people can manage; the longer the ramp the less severe the gradient that is feasible. Where it is necessary to provide a longer ramp to relieve harsh gradients, it is recommended to include a level resting area for every 500mm rise in the design.
- Ramps should never be longer than 132 metres in total and preferably no longer than 50 metres.
- Means should be provided to limit the risk of people colliding with the underside of freestanding ramps at any point where the clear height is less than 2.1m.
- The transition between the level and inclined parts of the ramp should be sufficiently rounded to ensure that a wheelchair user does not get caught by the foot supports.

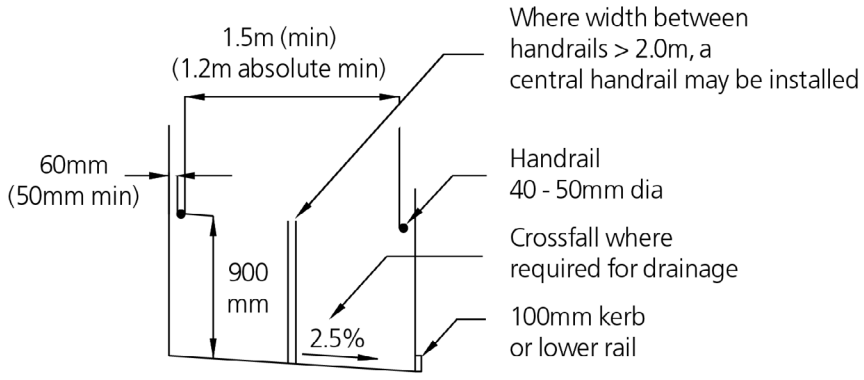
Further references

- Department for Transport – Inclusive Mobility.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.

DE103	Ramp	AADT: N/A 85th percentile speed: N/A



Ramp key dimensions



Section through ramp

Note:
Dimensions above for walking route and wheeling ramps.

Llywodraeth Cymru Welsh Government	DE number: DE103	Previous DE number: DE103
	Do Not Scale Drawing	Revision number: 3
	Copyright: Welsh Government	

DE104 Steps

Measure and brief description

Steps allow direct movement for people walking from one level to another where there would otherwise be a significant gradient, however they are an obstacle for people wheeling (see section 11.18).

Benefits

- Direct routes for people walking.
- Steps can provide a useful shortcut to maintain desire lines where the change in level or grade is high enough that requires a longer ramp to be provided.
- Steps built within public spaces are particularly popular because they can also serve as a good lookout point.

Key design features

- Steps should usually only be provided in conjunction with a ramp (or lift) in order to retain accessibility for disabled people, older people and parents and carers with buggies.

Dimensions[4]

- A riser height of 150mm can be managed by most people; a little more than this is possible if there are well designed handrails, but 170mm should be regarded as the absolute maximum in most circumstances. Steps with very shallow risers can cause problems and should be avoided; 100mm is the absolute minimum. All steps in a flight must have the same dimensions.
- Tread depth or going should be 300mm deep (approximately the length of a size 9 shoe), with an absolute minimum of 250mm.
- The nose of the step should be rounded (6mm radius) without any overhang.
- Steps should be well lit (minimum 200 lux) and surfaced with a slip resistant material.
- Colour/tonal contrast on the step noses is beneficial for blind and partially sighted people and should extend across the full width of each tread, 55mm deep on both tread and riser.
- The maximum number of risers in a flight should be 12, with resting places between successive flights. Resting places should have a desirable minimum length of 1.8m and an absolute minimum length of 1.2m, and be across the full width of the steps. The minimum number of steps in a flight should be three; fewer than this is less safe.
- The desirable minimum clear width between handrails is 1.2m which is sufficient for a disabled person and companion, with an absolute minimum width of 1m.
- Handrails should be provided on both sides and, where steps have a clear width of more than 1.8m, a centre handrail should also be provided.

4 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

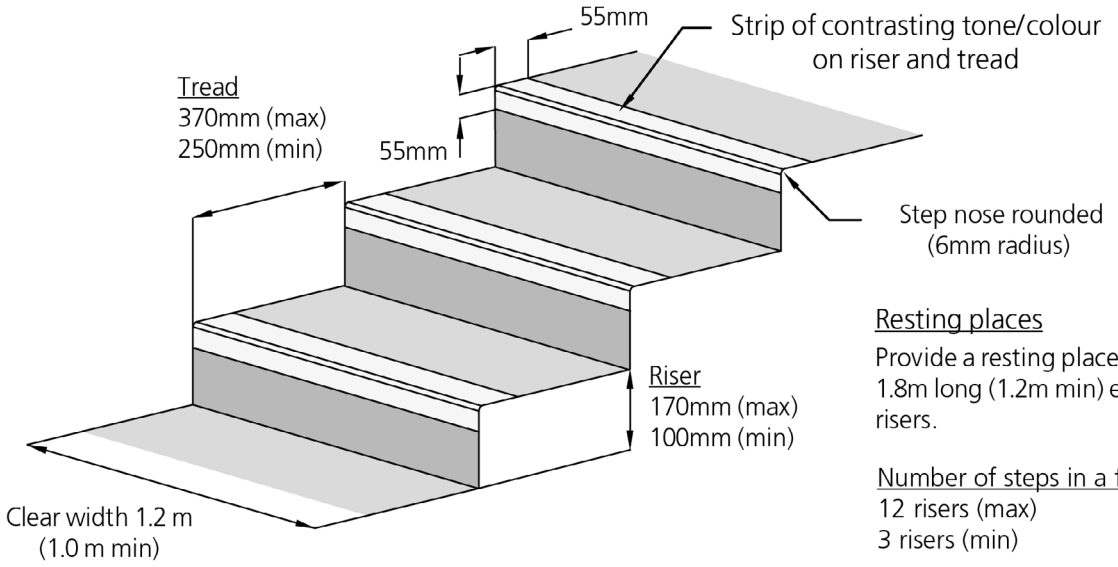
Other considerations

- Means should be provided to limit the risk of people colliding with the underside of freestanding steps at any point where the clear height is less than 2.1m.
- Incorporation of corduroy warning paving to the top and bottom, and visual contrast between elements should be used to highlight features such as steps edges and handrails.
- Open tread steps are to be avoided, as are curved or spiral steps.
- There should be unobstructed landing space at the top and bottom of each flight of steps of a length at least equal to the unobstructed width of the steps.

Further references

- Department for Transport – Inclusive Mobility.
- Department for Transport – Guidance on the use of tactile paving.

DE104	Steps	AADT: N/A 85th percentile speed: N/A



Resting places

Provide a resting place (landing) 1.8m long (1.2m min) every 12 risers.

Number of steps in a flight

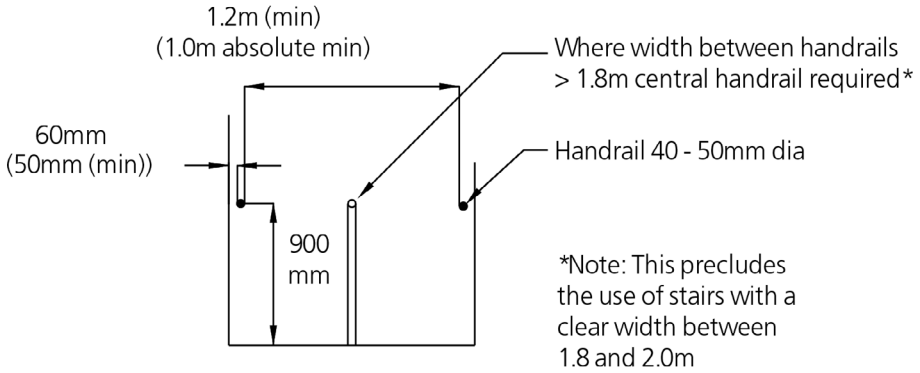
12 risers (max)
3 risers (min)

Pitch (angle) of steps

25° (min)
35° (max for high usage)
45° (absolute max)

Rule of thumb:
tread length + 2 x riser height = 600mm

Steps key dimensions



Section through steps

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DE105 Wheeling ramp

Measure and brief description

Where cycle routes are introduced onto routes originally designed for walking use only, such as canal towpaths or railway footbridges, flights of steps are sometimes unavoidable, at least in the short term. To assist people with cycles, wheeling ramps should be added to the flights using steel sections or by forming them in concrete (see **section 11.19**).

Benefits

- Enables people cycling to negotiate an existing footbridge or underpass at minimal cost where a ramp is not possible.

Key design features

- Locating the wheeling ramp close to the wall minimises the trip hazard for people walking.
- The ramp and hand rail should be far enough away from the side-wall to allow people with cycles to use it without the side-wall snagging their handlebars (including cycles with wide handlebars), but not so far out as to impede people who need to from using the hand rail. In practice, the wheeling ramp should normally be directly below the hand-rail, with enough height difference between them for a cycle, angled slightly outwards, to fit beneath the hand-rail.
- The wheeling channel needs to extend beyond the top and bottom steps to provide a smooth transition.
- Steel sections should have a non-slip surface so that the tyres grip the ramp on descent.
- In most cases the ramp is fitted to one side, usually on the right for people climbing, but on well used routes a ramp on each side may be considered.

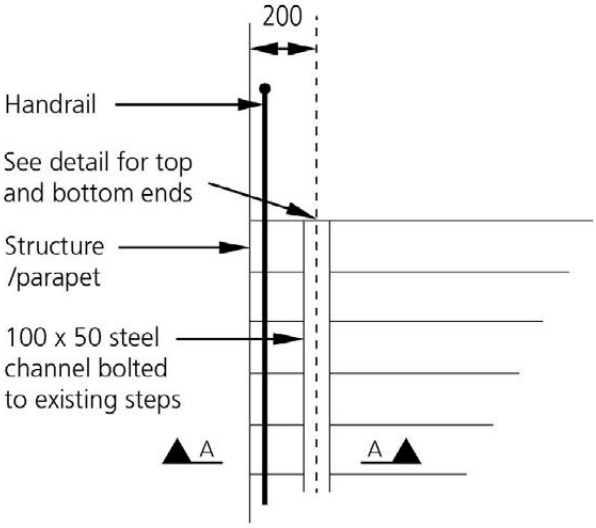
Dimensions

- A channel 100mm wide and 50mm deep is generally suitable.
- The centres of the channel and hand rail should be 200mm from the side wall for ease of use.
- Handrail should be above wheeling ramp, with the centre of both being 200mm from the wall.

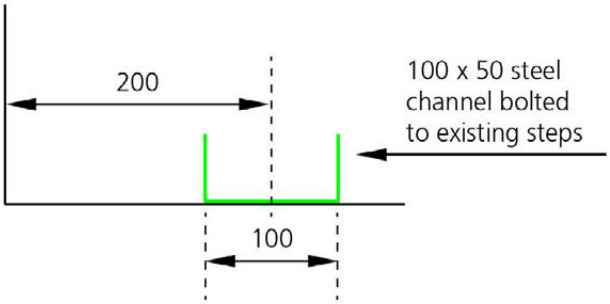
Other considerations

- Wheeling ramps should not obstruct convenient access to the handrail nor be located in the centre of the steps where they might form a trip hazard.
- Where a ramp is constructed in metal, a continuous piece is preferred.
- In some instances timber and stone surfaces blend better with the original construction.
- Requires considerable effort from people who cycle, especially with luggage.
- Are of no benefit to many non-standard cycles such as tricycles, cargo cycles and cycles with trailers.

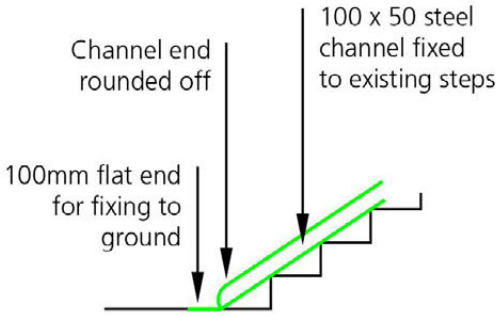
DE105	Wheeling ramp	AADT: N/A 85th percentile speed: N/A



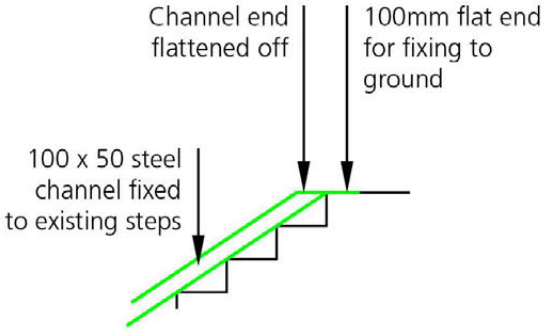
Elevation



Section A - A



Bottom end detail



Top end detail

Llywodraeth Cymru Welsh Government	DE number: DE105	Previous DE number: DE105
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DE201 Raised table junction

Measure and brief description

Raised table junctions create safer environments for all users by reducing the speed of vehicles negotiating the junction. They are typically used at priority junctions but can also be applied to roundabouts (including mini roundabouts and implied roundabouts) and traffic signals (see section 11.6 and section 11.7).

Raised table junctions can be used on roads with a speed limit of 30mph or less, with adequate street lighting provision, in the following situations:

- urban/suburban residential and mixed use areas;
- in town centres as part of public realm improvements, where raised tables at key junctions provide informal crossing points for people walking and wheeling.

Raised table junctions are road humps and must comply with the Highways Act 1980, Sections 90A to 90F.

Benefits

- Raised tables emphasise the presence of a junction, encourage people driving and cycling to have more attention and giving informal priority to people walking and wheeling.
- Raised table junctions help reducing the speeds, which if reduced to under 22mph (85th percentile), will allow for cycling mixed with general traffic, not requiring separated cycling facilities.
- The speed reduction effect of raised tables can be used to mitigate reduced visibility at some low volume/low speed junctions.
- Raised table junctions included as part of wider traffic calming measures can discourage through traffic.

Key design features

- The raised table must comply with the Highways (Road Humps) Regulations.
- The raised table should extend from kerb to kerb to benefit people walking and wheeling who are crossing the junction. This will require attention to drainage requirements to avoid standing water at the bottom of the ramps.
- Appropriate tactile paving should be provided at pedestrian crossing points (see Guidance on the Use of Tactile Paving Surfaces).
- Approach ramps should preferably be located sufficiently far from the junction mouth so that the changing level of the carriageway does not become problematic for people cycling when turning.
- It may be necessary to install build outs, bollards or introduce parking restrictions as appropriate in order to prevent parking around the junction which could obscure people trying to cross.

- Drainage covers/gully gratings should be set flush with the surface to avoid becoming a hazard for people walking, wheeling and cycling and should preferably not be in the path of a crossing.

Dimensions[5]

- Approach ramps with a sinusoidal profile will reduce discomfort for bus users and people cycling compared to a 1 in 10 ramp.
- Table height should normally be 75mm, and no more than 100mm.
- Kerb radii should be reduced to 2-3m, subject to vehicle tracking (and allowing for vehicles to use the whole width of the carriageway to turn and cross centrelines unless flows are high).

Other considerations

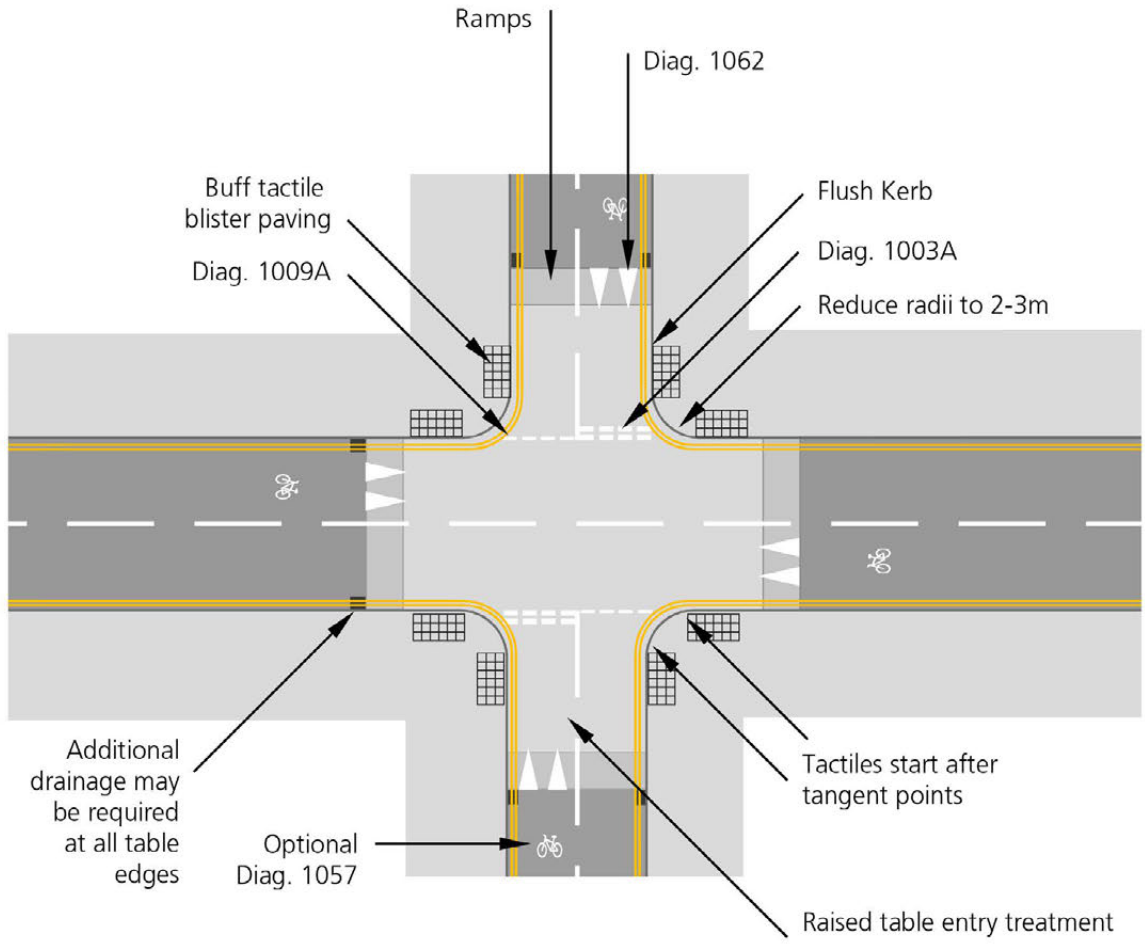
- Bollards may be provided to prevent over-run on corners.
- Strengthened corners may be necessary if over-run is to be expected.
- Raised tables can usefully be provided between junctions, using similar design criteria.
- The blister tactile paving should cover the whole length of flush kerb. Outside of the kerb crossing points, kerb should transition to a height difference of no less than 50mm to be cane detectable by visually impaired users. Corduroy/hazard tactile paving should be used in sections where there is a lack of a kerb upstand (but blister paving should still be used at crossing points).
- Early engagement with groups representing people with sight loss and other disabilities is essential, particularly where new or uncontrolled crossings are proposed (see chapter 5 and guidance in the use of tactile paving surfaces).

Further references

- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance on the use of tactile paving.

5 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE201	Raised table junction	**AADT:** <2000 **85th percentile speed:** <22mph



Note:
1. The 22mph 85th percentile speed refers to the full arrangement in the detail, with cycling mixed with the traffic. If a raised table junction is used with separated cycling or outside of a cycling route, the arrangement would be suitable for 85th percentile speeds up to 33mph (see table 11.1 and table 12.1).
2. The AADT for this detail refers to the uncontrolled crossings. If these were replaced for a controlled crossing, the arrangement would be suitable for higher volumes of traffic (see table 12.1).

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DE202 Sinusoidal hump

Measure and brief description

Traffic calming measures are used to reduce motor vehicle speeds thereby improving safety for people walking, wheeling and cycling as well as improving living conditions for residents living along traffic calmed routes. The provision of sinusoidal profile humps reduces the discomfort for people cycling when riding over humps, whilst still being effective in reducing traffic speed (see **section 11.6** and **11.7**). Sinusoidal humps are road humps and must comply with the **Highways Act 1980**, Sections 90A to 90F.

Benefits

- Sinusoidal road humps minimise discomfort for bus users and people cycling and are effective at reducing motor-vehicle speeds.
- Improve perceived and actual safety for people walking, wheeling and cycling.
- Reduction in traffic speeds helps improve comfort and safety for people cycling and helps creating more suitable cycle routes.
- Helps reduce the necessity for speed limit enforcement by police.
- Can improve living conditions for residents living along traffic calmed roads.

Key design features

- The sinusoidal road hump must comply with the Highways (Road Humps) Regulations.
- As an exact profile may be difficult to construct, so an approximate sinusoidal profile is acceptable, with a tapered entry and exit profile.

Dimensions

- Hump height should normally be 75mm, maximum 100mm, see also Local Transport Note 1/07.

Other considerations

- Where a drainage gap is provided at the edge of a sinusoidal hump it should not be wide enough that people driving use it.
- Sinusoidal ramps made of pre-cast materials should not be used where there is high use by HGV traffic as they are likely to work loose.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Sinusoidal road humps may be constructed if the highway is subject to a statutory speed limit for motor vehicles of 30mph or less, and adequate lighting is provided.

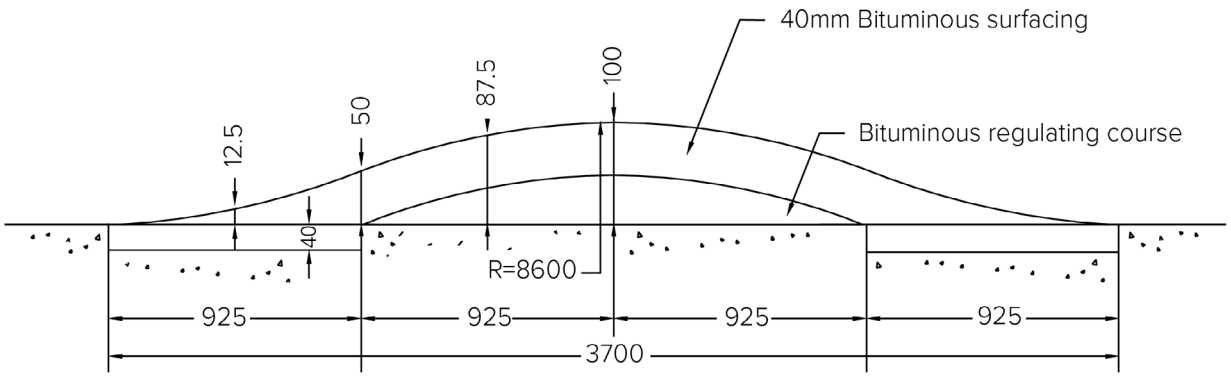
Further references

- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Highways (Road Hump) Regulations.
- Highways Act 1980.

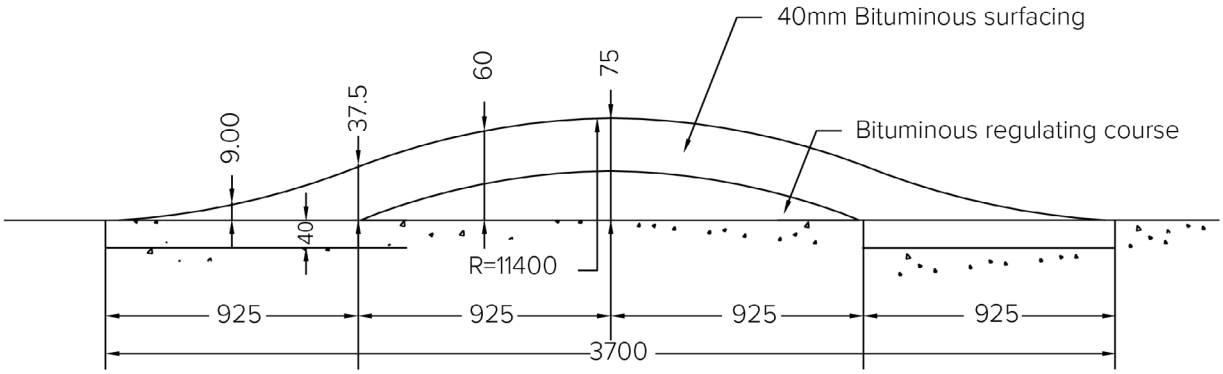
DE202

Sinusoidal hump

AADT:
N/A
85th percentile speed:
N/A



A. 100mm high hump



B. 75mm high hump

Notes:

Flexible construction is shown but other materials may be used, for example pre-cast concrete
R = Radius of sinusoidal hump
All dimensions are in mm

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DE203 Cycle bypass at narrowing

Measure and brief description

Traffic calming measures are used to reduce motor vehicle speed thereby improving safety for people walking, wheeling and cycling as well as improving living conditions for residents living along traffic calmed routes. Traffic calming can improve walking, wheeling and cycling conditions, but where poorly designed it can also be uncomfortable and in some cases be intimidating and dangerous. Where horizontal traffic calming features are provided consideration should be given to providing bypasses for people cycling (see **section 11.6** and **section 11.7**).

Benefits

- People cycling are not intimidated or squeezed by motor traffic.
- Improve perceived and actual safety for people walking, wheeling and cycling.
- Reduction in traffic speed helps improve comfort for people cycling and create suitable cycle routes.
- Helps reduce the necessity for speed limit enforcement.
- Can improve living conditions for residents living along traffic calmed roads.

Key design features

- Cycle bypass exits should not require people cycling to merge abruptly with motor vehicles.
- Parking and loading/waiting restrictions should be provided to avoid cycle bypasses becoming blocked by vehicles.
- Careful consideration should also be given to drainage at cycle bypasses to minimise gully grate conflict and flooding in the area.
- Bypasses should be wide enough to facilitate maintenance, for example, street sweeper vehicles.

Dimensions[6]

- a – Cycle bypass to traffic calming features to be 2m desirable minimum (1.5m absolute minimum).
- b – Gap for traffic between traffic calming features to be 3m max.
- c – Avoid pinch point distances of between 3.2m – 3.9m (see section 9.22).

6 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Bypasses should desirably be at carriageway level, in which case regular sweeping will be necessary.
- Footway level bypasses should consider impact on people walking and wheeling, and additional drainage will be required.
- When combined with a crossing, see detail DE608.

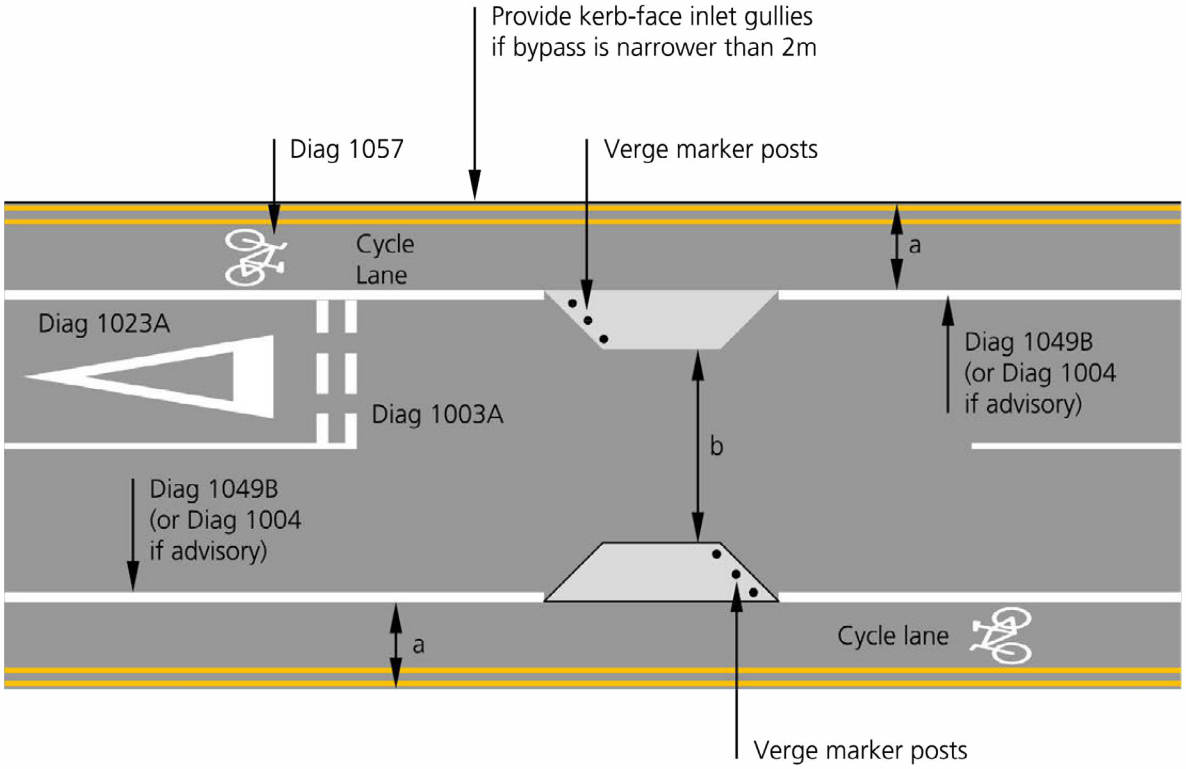
Further references

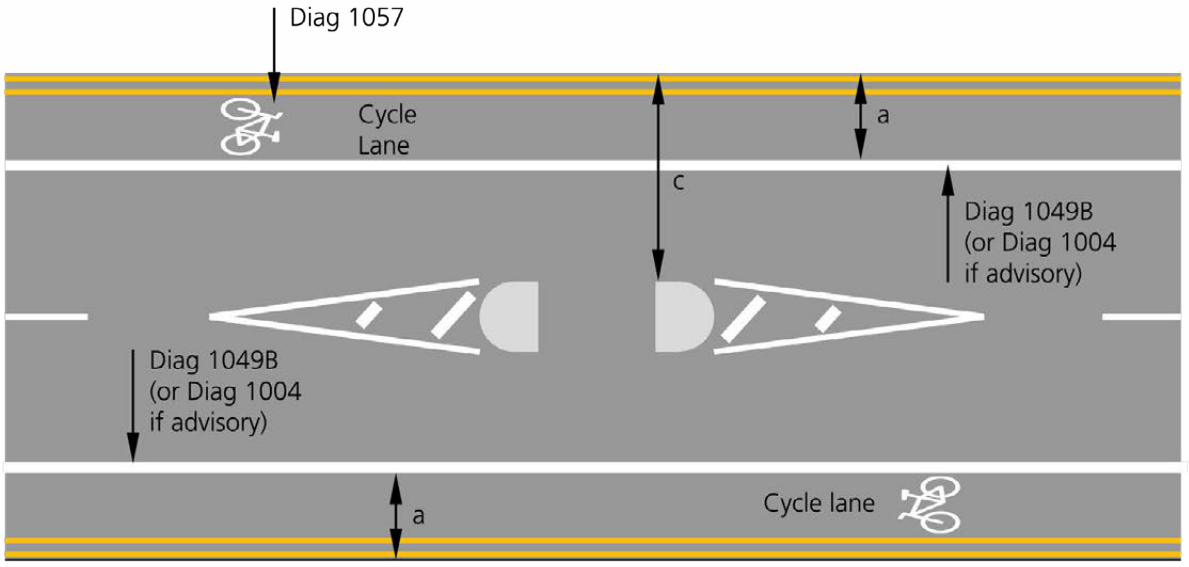
- Department for Transport – Local Transport Note 01/07. Traffic Calming.

DE203

Cycle bypass at narrowing

AADT:
<5000
85th percentile speed:
<22mph





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DE204 Cycle-only access with right turn facility

Measure and brief description

People cycling should be exempted from access restrictions applied to motor traffic on links or at junctions where safe to do so, or through the creation of short connections which are only available to people walking, wheeling and cycling, to give them time and distance advantages. This example shows how a cycle-only access can be provided, which includes a central lane to assist people cycling in turning right (see **section 11.6**).

Benefits

- Reduces cycle journey times.
- Increase permeability of area for people cycling.
- Provide convenient and attractive routes.
- Helps to reduce through traffic in neighbourhoods where motor traffic in residential streets is a problem, helping to deter unnecessary car trips.
- Relatively low cost.
- Can be retro-fitted to existing streets.

Key design features

- Traffic movements are often banned to help ease congestion by deterring traffic from certain streets. It is possible to exempt cycles from turning bans without having to significantly change the physical nature of the road.
- Where a closure is planned the preferred method is by the use of bollards with cycle signing mounted on them.
- Demountable bollards can be used to retain access for emergency vehicles. Dedicated right turn pockets for people cycling provide protection whilst waiting to make a turn.

Dimensions[7]

- a – Dedicated right turn pockets for people cycling to be 2m desirable minimum (1.5m absolute minimum).
- Width for people cycling at cycle only entry to be 1.5m absolute minimum.

7 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

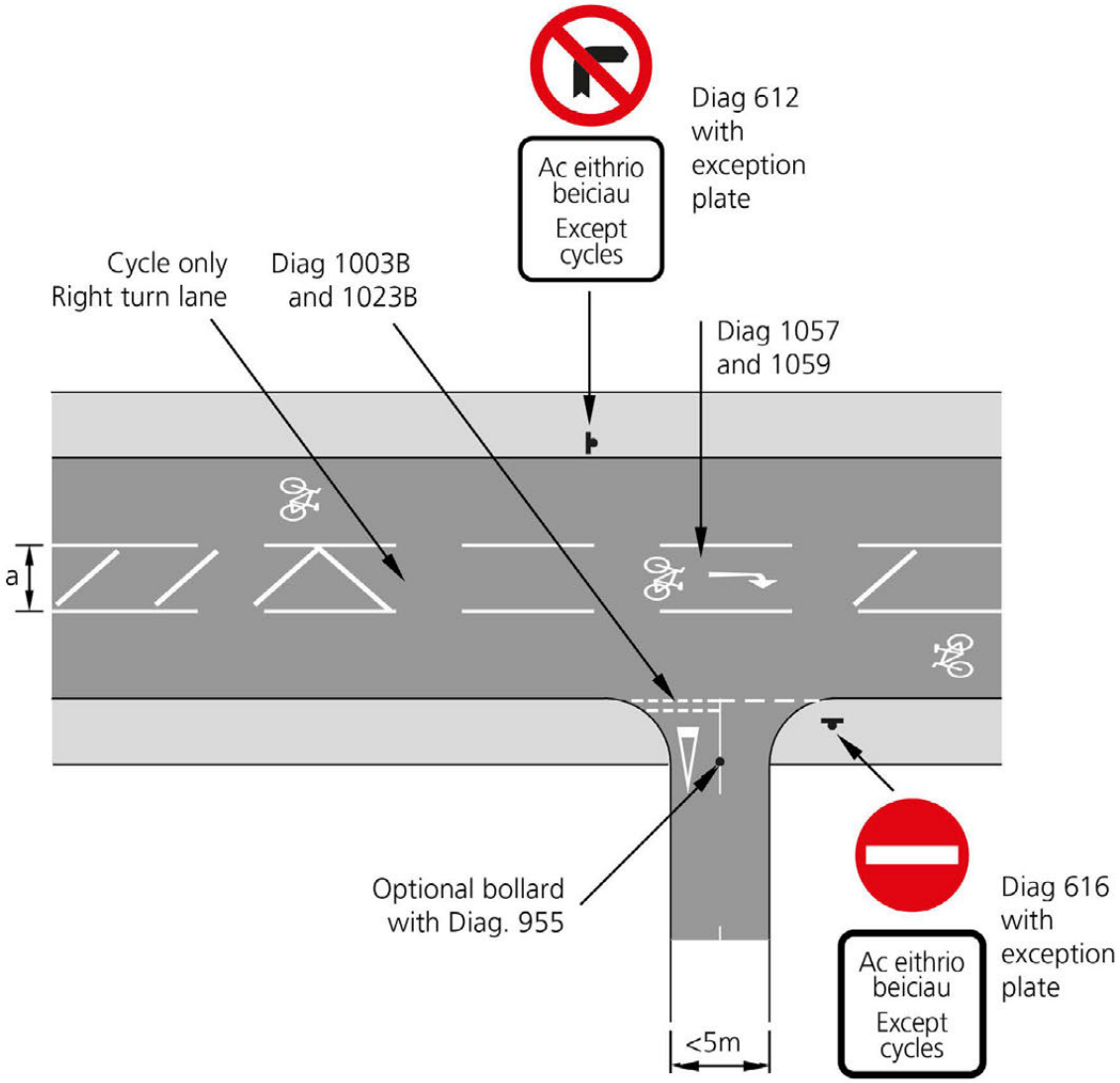
Other considerations

- Consideration should be given to:
    - Need to restrict car parking in the vicinity of the cycle gap, for example through double yellow line or a parking restricted zone.
    - Providing good natural surveillance to deter crime and increase the actual and perceived safety of the area.
    - Potential need to maintain access for emergency vehicles.
    - Interaction between people walking or wheeling, and people cycling.
- Build outs or other features may be needed to keep the cycle gap clear of parked vehicles.
- The impact of road closures can be assessed by undertaking a trial closure on a temporary basis. The closure can then be made permanent if it is found to be successful.

DE204

Cycle-only access with right turn facility

AADT:
<2500
85th percentile speed:
<22mph



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Welsh Government

DE number: DE204 | Previous DE number: DE204

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DE205 Quiet streets

Measure and brief description

Quiet Streets is a term given to urban cycling routes on low traffic speed and volume back streets, which are particularly suitable for people who are new to cycling, or less confident cycling. Routes should maintain continuity for cycling and tackle physical barriers such as busy junctions, narrow paths, and should minimise diversions away from desire lines.

Cycle symbols to diagram 1057, without necessarily the use of vertical signs to diagram 967, can be used to sign the continuity of cycle routes and indicate the correct positioning for cycling within the carriageway; in doing so they also help to raise the awareness to those who drive that people might be cycling in the carriageway, and encouraging them to allow space for cycling (see **section 11.9**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Continuous direct routes for cycling following desire lines.
- Relatively low cost solution.
- Largely un-separated from motor traffic, but separation can be used when required.
- Secure and perceived as secure (socially safe).

Key design features

- Routed generally via lightly-trafficked roads (less than 2500 vehicles AADT and measured 85th percentile speeds of less than 22mph) and very limited HGV traffic.
- Where traffic volume levels or speeds observed exceed these values, motor traffic reduction or a filtered permeability approach should be used to reduce motor vehicle volume, or a different type of cycle provision should be proposed (see table 11.1).
- Diagram 1057 can be useful to improve legibility of the route where needed. It is recommended that it is placed at junctions to warn the vehicles joining the carriageway that people might be cycling in that road.
- Points of conflict with oncoming and crossing traffic, parked vehicles and loading bays (kerbside activity) should be minimised.
- Minimise overall delays and provide route continuity and safety by prioritising cycle movements at junctions.

Dimensions

- Where 1057 markings are provided to highlight the route they should be spaced at regular intervals.

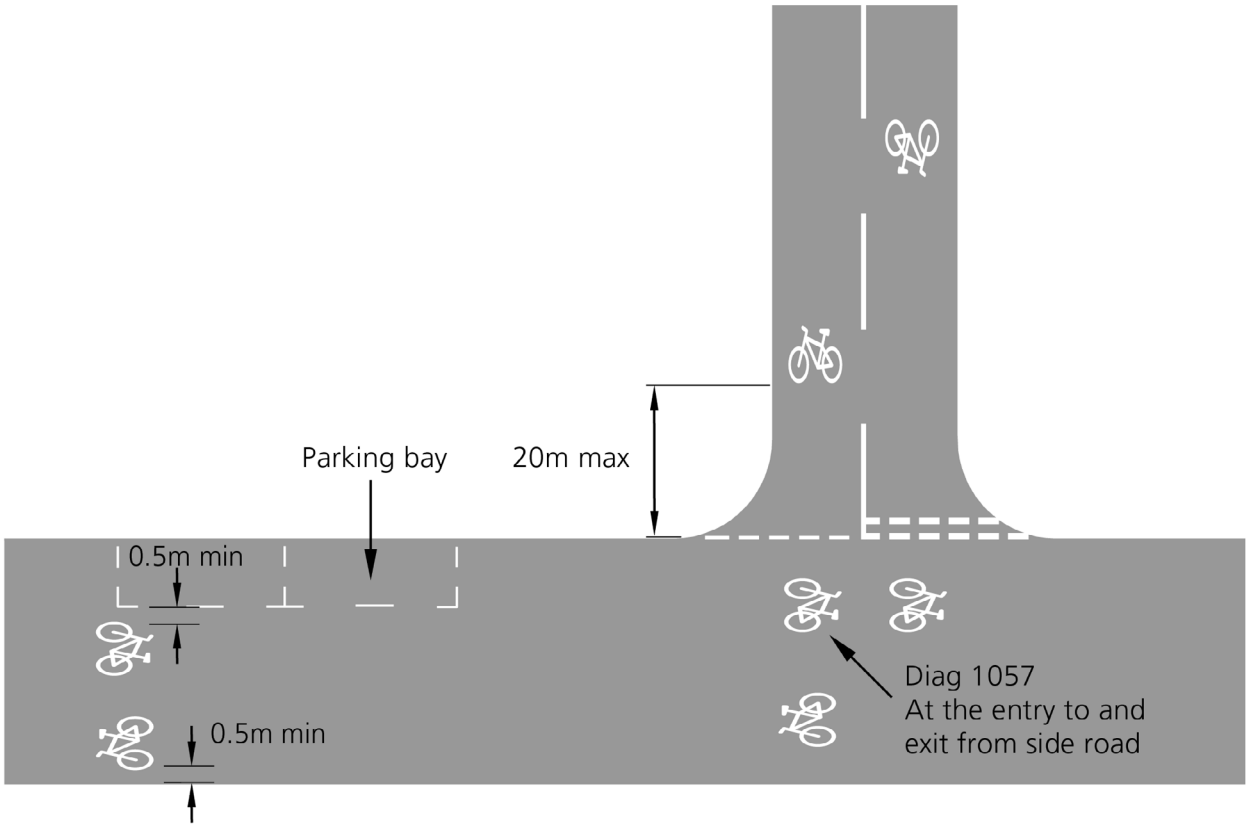
Other considerations

- TSRGD no longer requires the use of vertical signs to diagram 967 with diagram 1057 markings, and authorities may choose to only place signs where there is a clear need to alert other road users to the presence of a cycle route.
- The 20mph default speed limit changes in Wales are effective in enabling quiet streets to be a part of the basic network. However, it is important to consider that measures may be required to ensure that the measured 85th percentile speed is 22mph or less, so that creating a quiet street is possible.

DE205

Quiet streets

AADT:
<2500
85th percentile speed:
<22mph



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DE number: DE205	Previous DE number: DE205
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DE206 Cycle streets

Measure and brief description

A Cycle Street is a Quiet Street which also serves as a primary cycle route. It should carry low levels of low speed motor traffic, high levels of cycling, and provide people cycling with a level of service comparable to that provided by a high quality traffic free route. The objectives of a Cycle Street are to:

- present a legible design recognisable to all types of user as a main cycle route.
- influence behaviour so that people cycling assume priority over motor vehicles.
- maintain priority for people cycling.
- attract people who are experienced in cycling as well as people who are less confident.

There is no standard design; design approaches should be creative, easily maintainable and adaptable (the design detail provided is one indicative solution); the street should be physically recognisable, including from side roads (see **section 11.10**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

Benefits

- Improved safety and perceived safety of people cycling.
- Improved route legibility.

Key design features

- Street design should encourage people cycling to assume priority, with motor vehicles travelling slowly and not overtaking them.
- People cycling should have priority along links and at junctions to increase convenience.
- The length over which a car has to follow a person cycling should be limited to between 200m and 400m.
- Street should carry no more than 2,500 motor vehicles AADT.
- Where motor traffic volume levels exceed these values, traffic reduction or a filtered permeability approach should be used to reduce motor vehicle flows.
- Traffic speeds to be low – 85th percentile below 22mph and 15mph advisory speed limit.

Dimensions[8]

- a – Cycle lane width 1.5m absolute minimum, 3m absolute maximum.
- b – Central median, 1.2m absolute minimum.
- Where diagram 1057 markings are provided to highlight the route they should be spaced at regular intervals.

Other considerations

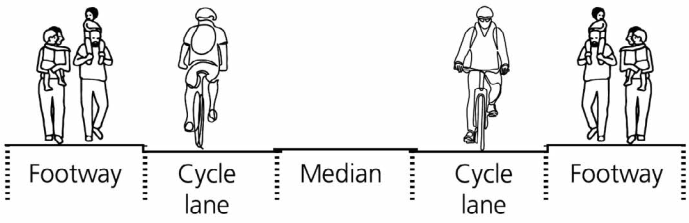
- TSRGD no longer requires the use of vertical signs to diagram 967 with diagram 1057 markings. Authorities may choose to only place signs where there is a clear need to alert other road users to the presence of a cycle route.

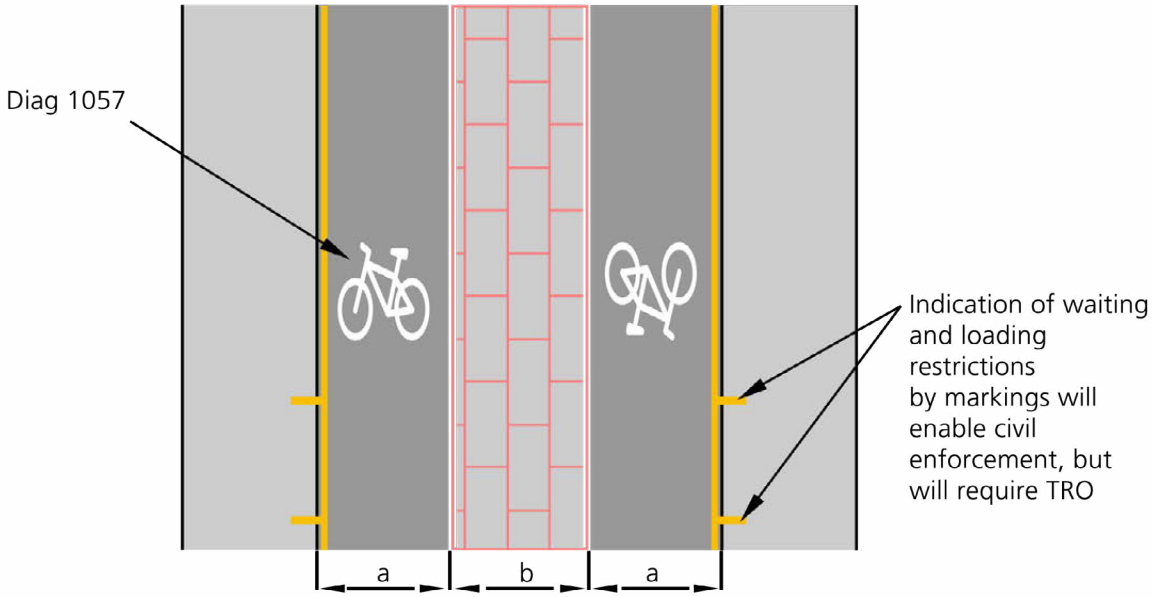
8 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

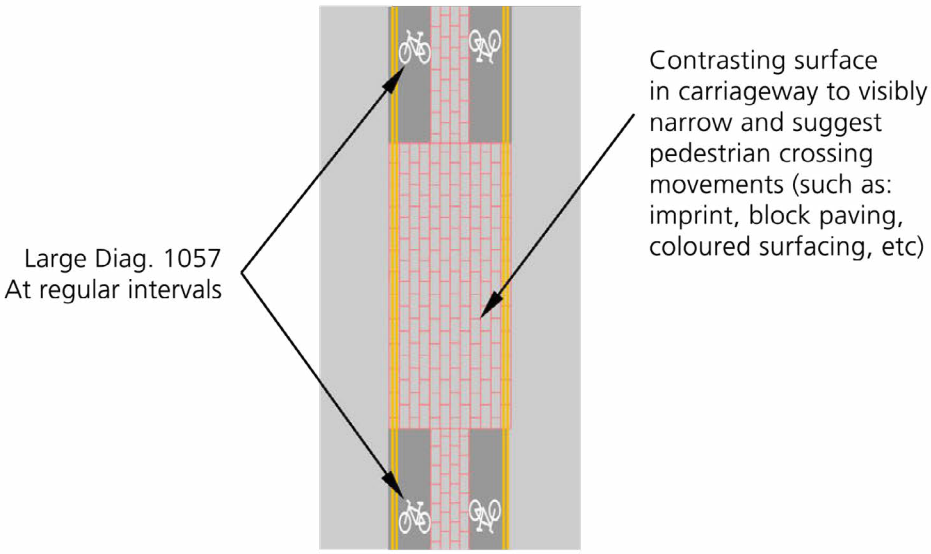
DE206

Cycle streets

AADT:
<2500
85th percentile speed:
<22mph







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DE207 Central median strip

Measure and brief description

A central median strip is a long paved area of different coloured or textured surfacing in the centre of a carriageway which provides space for people walking or wheeling to wait in, while crossing a road in two stages at any point along its length, whilst also helping to lower vehicle speeds (see section 12.6).

Benefits

- Central median strips enable people walking or wheeling to cross carriageways in two stages.
- This is particularly useful where crossing movements are distributed along a significant length, for example along a shopping street.
- These strips can also enhance the character of a highway and help to lower vehicle speeds. They also provide safety benefits to people cycling, helping to prevent collisions with motor vehicles turning into and out of the side road.

Key design features

- The width of the central median needs to be sufficient for a person walking or wheeling to wait safely in the median for a gap in the traffic.
- The median may be constructed to enable occasional overrun by larger vehicles, or kerbed to prevent vehicular overrun.
- Kerbed medians will give the most confidence to people walking or wheeling that are crossing the carriageway. Central medians can be designed to be overrun so that the carriageways can be kept narrow but still allow for vehicles to pass stationary buses etc.
- Strips that are designed to be overrun can be flush or domed and/or constructed in rough surfacing so that vehicles travel slowly when travelling across the median.
- Designated crossing points may still be provided at intervals, with flush kerbs on the median and at the footways. Tactile paving should be provided at these flush kerbs.
- Raising the carriageway to footway level across the mouth of the side road can be considered to facilitate crossing (see Guidance on the Use of Tactile Paving Surfaces).

Dimensions[9]

- a – Lane width either side to be below 3.2m or above 3.9m, avoiding the critical lane width range for people cycling (see section 9.21).

9 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- b – Width of median strip should be a desirable minimum of 2.0m to accommodate a wheelchair and a person pushing (if required) and an absolute minimum of 1.2m.
- Minimum kerb height of 60mm is recommended, except at crossing points where it should be flush.

Other considerations

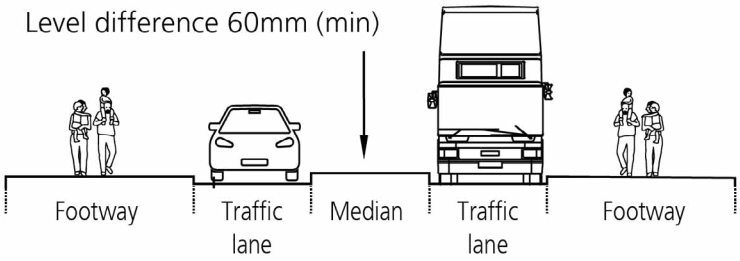
- Unless kerbed, the form of construction of the median strip will need to accommodate vehicular overrun.
- Subject to vehicle tracking requirements, trees and planting can be placed in the central median.

DE207

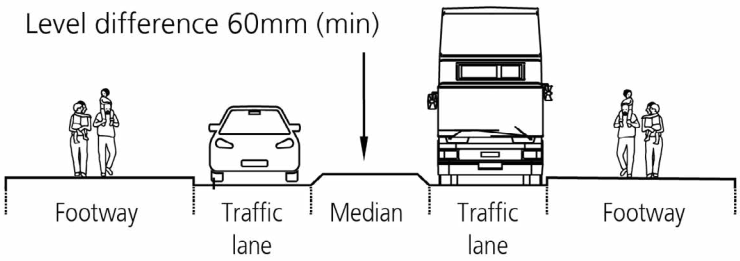
Central median strip

AADT:
N/A
85th percentile speed:
N/A

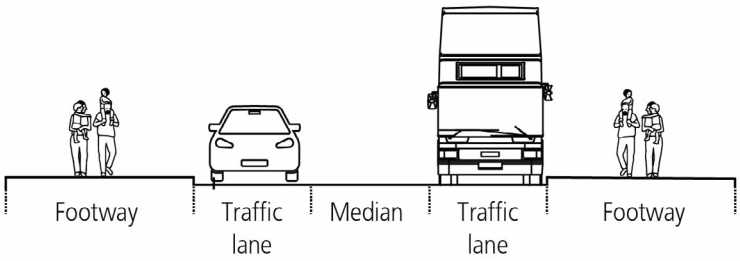
Kerbed median

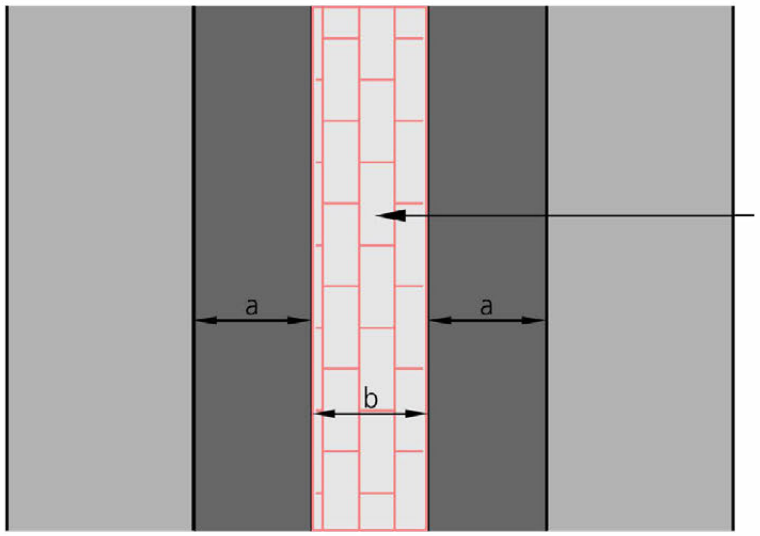


Humped median



Flush median





A material of differential colour, tone and/or surfacing should be used for the medianstrip (such as: imprint, block paving, coloured surfacing, ect)

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DE301 Mandatory cycle lane

Measure and brief description

Mandatory cycle lanes define an area of the carriageway that is reserved for people cycling and are suitable for roads where the 85th percentile speed is 22mph or less and no more than 5000 AADT. Mandatory lanes are marked with a continuous white line (diagram 1049B) which prohibits people driving motor-vehicles from entering the lane during the hours of operation, which should normally be at all times. There can be exceptions, such as emergency service vehicles and access to private driveways. Parking and loading should also be prohibited through appropriate controls. Mandatory lanes are preferable to advisory lanes and should be used unless there are particular local circumstances preventing their use. As per **TSRGD**, mandatory lanes do not require Traffic Regulation Orders (TRO) to be made (see **section 11.22** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- For exclusive use by people cycling during hours of operation (normally at all times).
- Delineated by solid white line, which is less likely to be crossed by people driving motor vehicles.
- Can be enforced by the Police.
- Reduces the potential for conflict between people driving and people cycling compared to an advisory lane.
- Highlights presence of people cycling.
- Reduced lane width for people driving is likely to reduce their speeds.

Key design features

- Continuity of cycle lane is essential.
- Solid white delineation line 150mm wide (diagram 1049B).
- Cycle symbol markings (diagram 1057) should be placed at the start of the lane and after every break, as well as at regular intervals on long uninterrupted lengths.
- TRO not required for use of marking but may be used to enforce parking.
- Lanes should operate at all times.
- Waiting and loading restrictions should apply at all times.

Dimensions[10]

- a – Desirable minimum 2.0m, Absolute minimum 1.5m.
- Cycle lane entry taper 1:10, exit taper 1:5.

10 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Mandatory lanes must be discontinued at side road junctions but the use of a short length marking to diagram 1010 preserves continuity.
- Mandatory lanes can be continued across private accesses.
- Additional protection of cycle lanes can be provided using hatched road markings and traffic islands.
- A person cycling in the 'secondary' position will fill a 1.5m cycle lane, so if this width cannot be provided a cycle lane is unlikely to be appropriate.
- Inadequate cycle lane widths may increase conflict risk because drivers do not realise that people cycling need to move away from the kerb to avoid surface hazards. A narrow cycle lane may also give people driving motor vehicles (misplaced) confidence to provide less clearance while overtaking than they would in the absence of a cycle lane.
- Greater width should be considered on uphill cycle lanes to allow for additional lateral movement.
- A single uphill cycle lane is preferable to two sub-standard lanes.
- Cycle lanes constrain people cycling to the margin of the carriageway and so cycle-friendly gully gratings are essential.
- Authorities may choose to only place vertical signs to diagram 959.1 with each diagram 1057 marking where there is a clear need to alert other road users to the presence of the mandatory lane.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

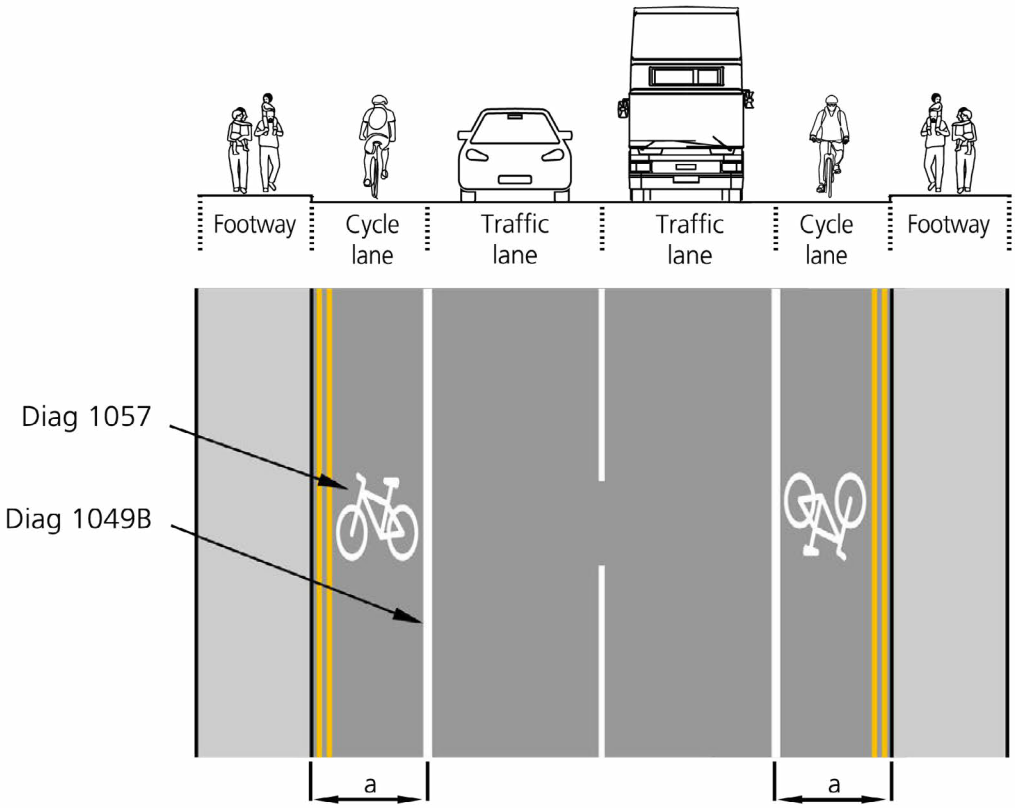
Further references

- Department for Transport (2019) – Traffic Signs Manual, Chapter 3.
- Manual for Streets and Manual for Streets 2.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE301

Mandatory cycle lane

AADT:
<5000
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE301 | Previous DE number: DE303

Do Not Scale Drawing | Revision number: 3

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DE302 Advisory cycle lane

Measure and brief description

Advisory cycle lanes define an area of the carriageway that is intended for people cycling. They are suitable for roads where the 85th percentile speed is 22mph or less and traffic volumes are no more than 5000 AADT. Advisory lanes are marked with a broken white line (diagram 1004) which indicates that other vehicles should not enter unless it is safe to do so. Advisory lanes are less preferable than mandatory lanes, which should be used unless there are particular local circumstances (see **section 11.22** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Can be used in circumstances where a carriageway is not wide enough to permit full width mandatory cycle lanes, resulting in people driving motor vehicles occasionally entering the cycle lane.
- Can be useful to indicate routes through a large or complex junction.
- Reduces the potential for conflict between people driving motor vehicles and people who are cycling.
- Highlights presence of people cycling.
- Reduced lane width for people driving likely to reduce their speeds.

Key design features

- Continuity of cycle lane essential.
- Bounded by broken white line 100mm wide (diagram 1004).
- Cycle symbol markings (diagram 1057) should be placed at the start of the lane and after every break, as well as at regular intervals on long uninterrupted lengths.
- TRO not required for advisory cycle lane.
- Waiting and loading restrictions should apply at all times.

Dimensions[11]

- a – Desirable minimum 2.0m, Absolute minimum 1.5m.
- Cycle lane entry taper 1:10, exit taper 1:5.

11 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Where width is constrained, a wider advisory cycle lane may be preferable to a narrow mandatory one.
- There can be benefits in continuing advisory cycle lanes through signalled junctions.
- Additional protection of cycle lanes can be provided using hatched road markings and traffic islands.
- A person cycling in the 'secondary' position will fill a 1.5m cycle lane, so if this width cannot be provided a cycle lane is unlikely to be appropriate.
- Inadequate cycle lane widths may increase conflict risk because people driving do not realise that people who are cycling need to move away from the kerb to avoid surface hazards. A narrow cycle lane may also give people driving a motor vehicle (misplaced) confidence to provide less clearance while overtaking than they would in the absence of a cycle lane.
- Greater width should be considered on uphill cycle lanes to allow for additional lateral movement.
- A single uphill cycle lane is preferable to two sub-standard lanes.
- Cycle lanes constrain people cycling to the margin of the carriageway and so cycle-friendly gully gratings are essential.
- A study in London from 2020, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

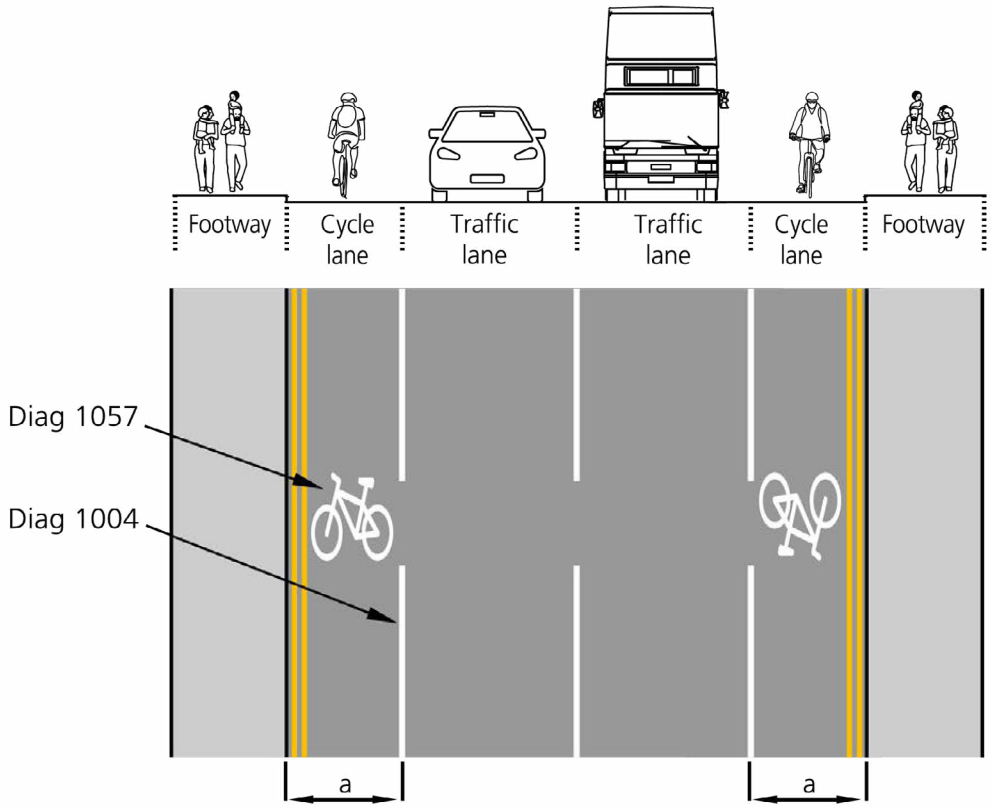
Further references

- Department for Transport (2019) – Traffic Signs Manual, Chapter 3.
- Manual for Streets and Manual for Streets 2.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE302

Advisory cycle lane

AADT:
<5000
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE302 | Previous DE number: DE304

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DE303 Protected contraflow

Measure and brief description

The permeability of the road network for people cycling can be greatly enhanced by exempting them from one-way restrictions. This provides connections that are only available to people cycling and reduces their travel times and distances. Protected contraflow cycling is provided by using physical separation (see **section 11.22**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Improves cycle journey directness.
- Enables people using cycles to avoid longer routes on busy roads.
- Gives cycling an advantage over people driving private motor vehicles.
- Likely to reduce the number of people cycling on the footway.
- In one-way streets people cycling in the contraflow have better vision of people exiting parked vehicles facing towards them.
- Affordable and relatively straightforward to introduce.

Key design features

- Physical separation is appropriate where motor vehicle speeds and/or volumes are higher, in the form of kerb separation or light separation (see table 11.1).
- Gaps should be used to allow people cycling access to the carriageway and junctions.
- Where contraflow lanes pass parked cars a 1m wide buffer zone should be provided.
- Entry points for general traffic should preferably be provided with an island with sufficient cycle gap that will not be blocked by people inappropriately parking their vehicles, as it gives added protection to people cycling against turning vehicles.
- 1057 cycle symbols should be used at entrances/exits and across side roads to alert people driving motor vehicles of likely cycle movements.
- 'No Entry' signs should be used rather than the 'No Motor Vehicle' sign (diagram 619) (see Traffic Signs Manual, Chapter 3).

Dimensions[12]

- Cycle lane with light separation width (a):
    - 2m desirable minimum.
    - Where cycling flows are predicted to exceed 250/hr (peak), the desirable minimum width should be increased to 2.5m (see table 9.10).

Other considerations

- Contraflow cycle lanes should be designed to general guidance and standards including where they pass side road junctions or tracks.
- Traffic calming features that require cyclists using the contraflow lane to change their alignment should be avoided, for example speed cushions and build-outs.
- Waiting and loading restrictions should be included in TROs for contraflow lanes to prevent people parking vehicles obstructing the lane and pushing people cycling into oncoming traffic.
- Echelon parking bays should be angled so that people parking motor vehicles reverse into them, such that they exit facing forwards and towards people cycling in the contraflow lane, therefore improving visual contact.
- Authorities may choose to omit vertical signs to diagram 960.1 and 960.2 when the speed limit is 20mph and the contraflow cycle lane is clearly visible.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

Further references

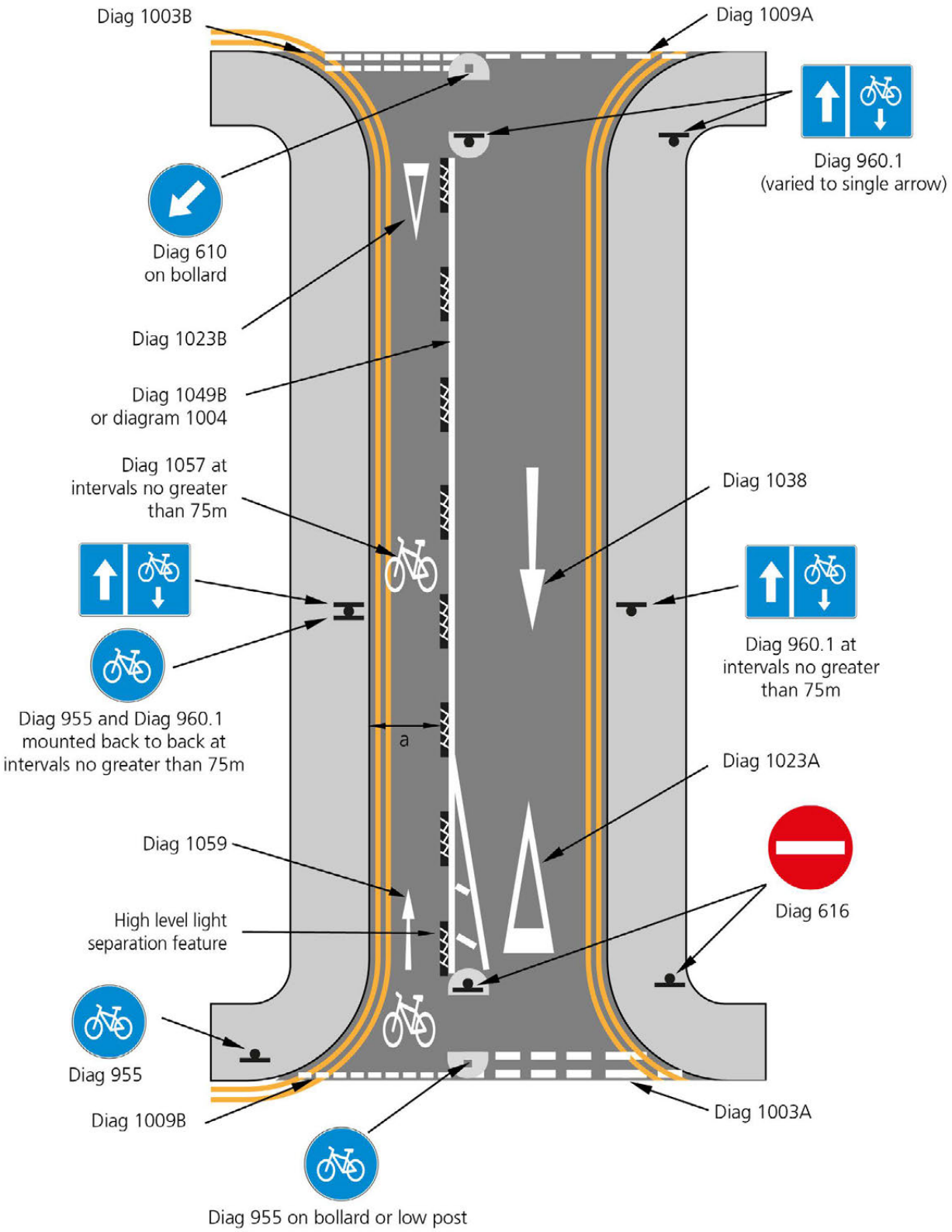
- Department for Transport – Traffic Signs Manual, Chapter 3.
- Manual for Streets 2.

12 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE303

Protected contraflow

AADT:
<6000
85th percentile speed:
<33mph



Llywodraeth Cymru
Welsh Government

DE number: DE303	Previous DE number: DE301
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DE304 Unprotected contraflow

Measure and brief description

The permeability of the road network for people cycling can be greatly enhanced by exempting them from one-way restrictions. This provides connections that are only available to people choosing to cycle and reduces their travel times and distances. Contraflow cycle lanes without physical separation can be provided as mandatory or advisory lanes. On less busy one-way roads with a narrow width two-way cycling may be permitted without a cycle lane (see **section 11.21**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Improves cycle journey directness.
- Enables people cycling to avoid longer routes on busy roads.
- Gives people cycling an advantage over people travelling by private motor vehicles.
- Likely to reduce the number of people cycling on the footway.
- In one-way streets people cycling in the contraflow have better vision of people exiting parked vehicles facing towards them.
- Affordable and relatively straightforward to introduce.
- Can be introduced without a cycle lane where motor traffic volumes and speeds are very low.

Key design features

- A contraflow cycle lane should preferably be marked.
- Mandatory cycle lane should be used in preference to advisory cycle lanes where space permits, traffic lane widths should be marked in accordance with minimum widths given in table 9.10; 'Manual for Streets 2', Section 8.6.4; and 'Manual for Streets' Figure 6.18.
- Advisory contraflow lanes are suitable where the 85th percentile speed is less than 22mph and motor traffic flows are below 1,000 AADT, and where the speed limit is less than 20mph.
- At entries and exits, consideration should be given to alert people driving, as well as people walking and wheeling of contraflow cycle movements using a short section of cycle lane.
- Cycle logos and directional arrows should be used especially at entrances/exits and across side roads to alert people driving of likely people cycling. Physical separation should be provided at the start and end of the contraflow.
- 'Except cycles' signs with 'No Entry' signs should be used rather than the 'No Motor Vehicle' sign (diagram 619) (see Traffic Sign Manual, Chapter 3).

Dimensions[13]

- When possible, physical separation such as islands and bollards should be used at the entrances and exits of the contraflow.
- Advisory lanes may be a suitable option where oncoming vehicles need to encroach into the cycle lane, for example, to pass obstructions.
- Sufficient carriageway space is required to ensure people cycling have enough space to pass oncoming vehicles, however it is possible to facilitate contraflow cycling in lightly trafficked narrow streets, including where there is car parking on one or both sides and a narrow running lane.
- Carriageway width (a):
    - Absolute minimum at pinch points, less than 20% of contraflow length: 2.6m (no car parking).
    - Absolute minimum: 3.85m based on car passing cycle (no car parking).
    - Absolute minimum at parking spaces, that should occupy less than 60% of contraflow length: 4.6m (with car parking on one side).

Other considerations

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Traffic calming features that require people cycling in contraflow to change their alignment should be avoided, for example speed cushions and build-outs.
- Echelon parking bays should be angled so that people driving reverse into them, so that they exit facing forwards and towards people cycling in the contraflow lane, therefore improving visual contact.
- Any car parking should preferably be on the opposite side of the carriageway to the contraflow cycle lane.
- However, where widths are very restricted, car parking on the contraflow cycle lane side will enable people cycling in the contraflow lane to wait in gaps between parked cars to avoid larger oncoming vehicles.
- Parking spaces should ideally be set back, as shown in DE307 where footway widths can still accommodate flows of people walking and wheeling, or should be provided in accordance with DE305.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

13 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

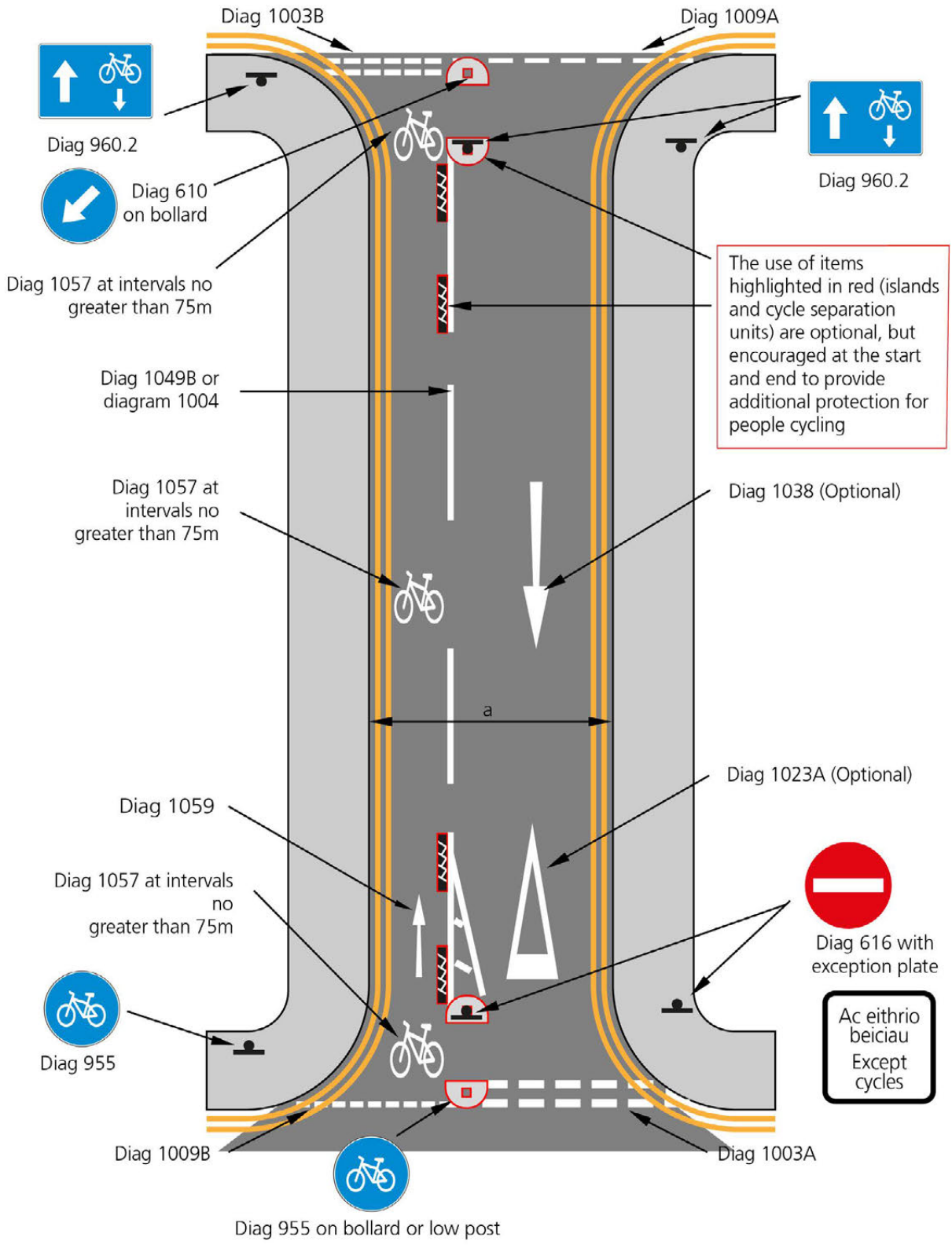
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Manual for Streets 2.
- Manual for Streets.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE304

Unprotected contraflow

AADT:
<1000
85th percentile speed:
<22mph



Llywodraeth Cymru Welsh Government	DE number: DE304	Previous DE number: DE302
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DE305 Cycle lane passing car parking/loading

Measure and brief description

Kerbside vehicle parking or loading can be dangerous for people cycling, especially parking spaces with high vehicle turnover rates, since there is a significant risk to people cycling from vehicle doors being opened by vehicle passengers or drivers. It is therefore highly desirable that cycle lanes pass vehicle parking areas with a dividing strip of sufficient width (buffer strip) (see **section 11.23** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Prevents people riding cycles being hit by people opening vehicle doors.
- Reduces the risk of people cycling having to swerve into motor traffic lane to avoid people who have opened vehicle doors into their path.
- Encourages good road positioning as taught in cycle training.
- Prevents people cycling getting trapped at the kerbside at the start of a parking bay.

Key design features

- Buffer strip between parking/loading bays and cycle lane.
- Hatched road markings may be used to define the buffer strip.
- Tapers required at approach to and at end of parking/loading bays.

Dimensions[14]

- a – Desirable minimum 2m, Absolute minimum 1.5m (see table 9.10).
- b – Buffer strip along parking/loading bays – desirable minimum 1m, absolute minimum 0.5m.
- c – Width of parking/loading bays:
    - for cars – minimum 2m wide.
    - for vans – minimum 2.4m wide.
    - for buses and HGVs – min 2.8m wide (preferably 3.2m wide).
- d – General traffic lane should be 2.5m min width, or 3m where there are significant heavy vehicle flows (see table 9.12).

14 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- 1:10 approach taper to allow people cycling the opportunity to safely realign themselves before passing parked vehicles.
- 1:5 exit taper to allow people cycling the opportunity to safely realign themselves after passing parked vehicles.

Other considerations

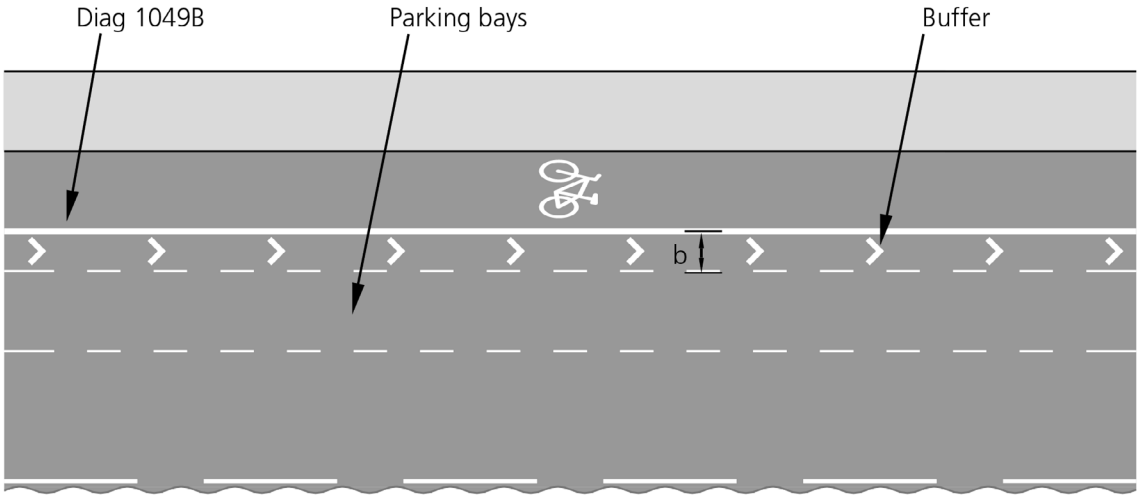
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Where space is limited due to parking, consideration should be given to the reallocation of space from parking to a safer walking, wheeling and cycling environment.
- Where carriageway widths are narrow and parking cannot be relocated or removed all day, timed mandatory cycle lanes could be considered for peak times.
- A 2.0m wide cycle lane can be reduced locally to 1.5m to allow a 0.5m wide buffer strip to be provided.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

Further references

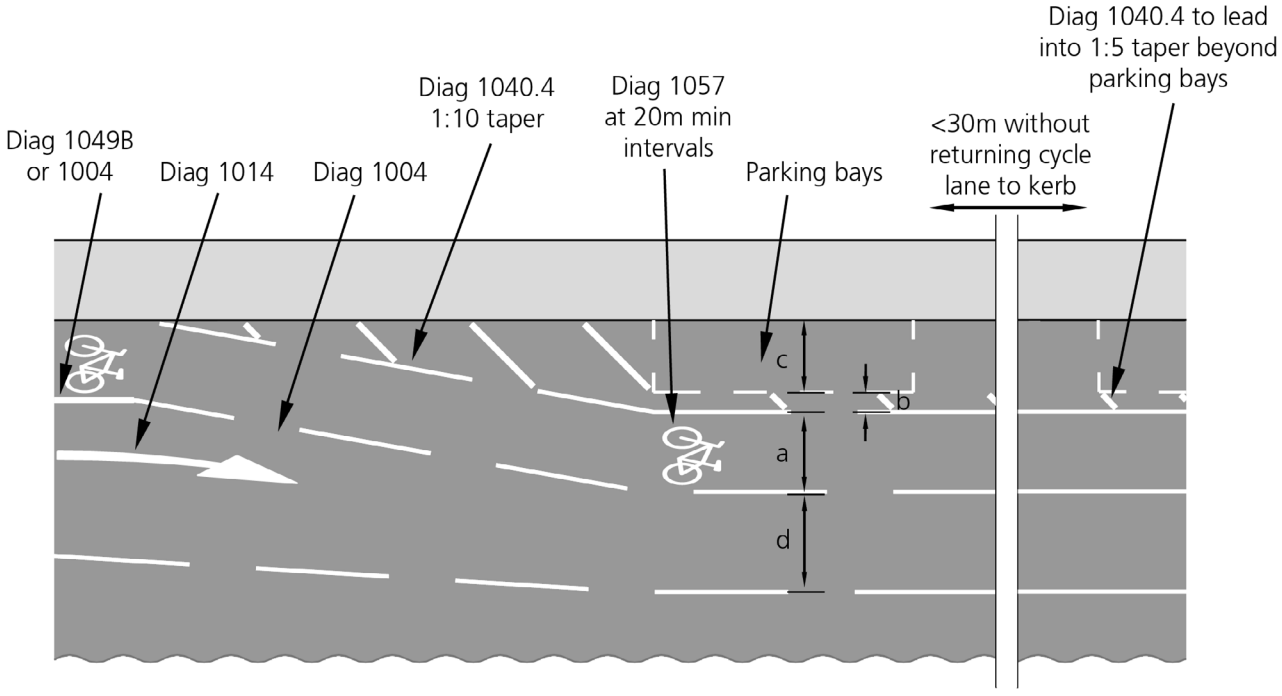
- Department for Transport – Traffic Signs Manual, Chapter 3.
- Manual for Streets 2.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE305	Cycle lane passing car parking/ loading	AADT: <5000 85th percentile speed: <22mph

Cycle lane passing inside of parking/loading bays



Cycle lane passing outside of parking/loading bays



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DE306 Cycle lane at side road

Measure and brief description

Cycle lanes should continue across side road junctions to ensure continuity and help improve safety. This can be achieved using a stretch of road marking to diagram 1010, where the white line is broken, since continuous mandatory lanes across side road junctions are not permitted, and in preference to advisory cycle lanes to diagram 1004. It is recommended that the cycle lane width be increased at the mouth of side roads to encourage people cycling to position themselves further out from the kerb in order to increase its effectiveness and avoid conflict with vehicles nosing out of junctions (see **section 11.24** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Improves conspicuity of people cycling at conflict point.
- Provides route continuity.

Key design features

- The use of diagram 1010 markings is recommended in preference to advisory cycle lanes to diagram 1004 to increase conspicuity.
- Cycle symbols (diagram 1057) may be placed in the cycle lane along the mouth of a junction.
- Coloured road surfacing may also be used in cycle lane to highlight an area of potential conflict.
- Wider cycle lanes across side roads help offer people cycling more space when people driving cars encroach onto their path and encourage better road positioning by people cycling.

Dimensions[15]

- a – Width on approach – desirable minimum 2.0m, absolute minimum 1.5m (see table 9.10).
- b – Width at side road should be at least 0.5m greater than on approaches.
- c – General traffic lane should be 2.5m minimum width, or 3m where there are significant heavy vehicle flows (see table 9.12).
- Widening at side road introduced with 1:10 entry taper and 1:5 exit taper.

15 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Side road entry treatments (DE604) should also be considered, which provide raised carriageway tables and reduced corner radii at side road junctions. They help reduce turning speeds for people driving motor vehicles, making it safer and more accessible for people cycling passing through the junction and people walking and wheeling across the side road.
- Entry to and from side roads should be reviewed to ensure appropriate sightlines and speeds are in place, to mitigate risks to people cycling from turning traffic.
- Side-road warning signs to diagrams 962.1 or 963.1 to warn people driving, walking or wheeling of the presence of people cycling are generally unnecessary except for situations where contra-flow cycling is permitted.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

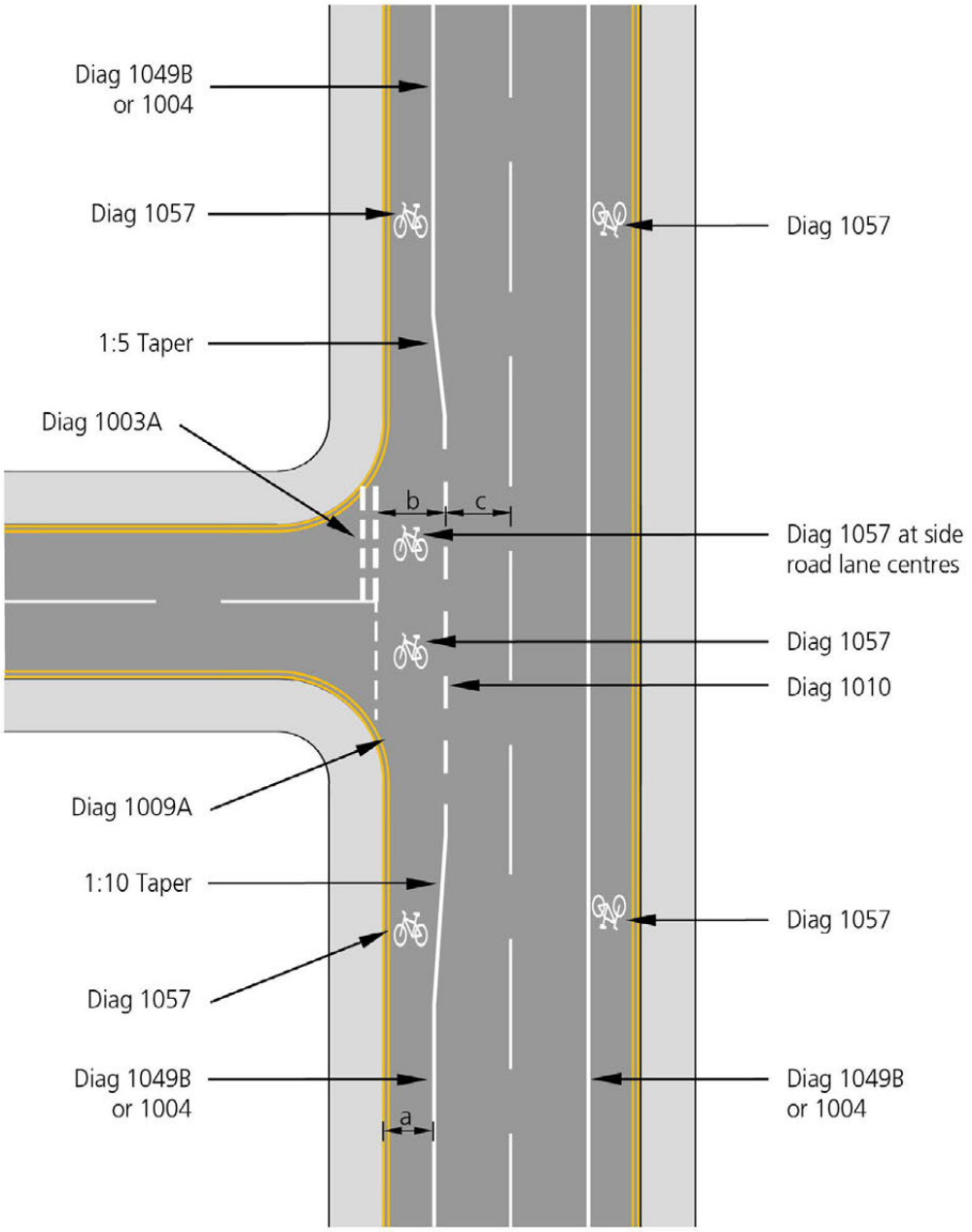
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Manual for Streets 2.
- TSRGD.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE306

Cycle lane at side road

AADT:
<5000
85th percentile speed:
<22mph



DE number: DE306	Previous DE number: DE306
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DE307 Cycle lanes with removal of centre lines

Measure and brief description

Consideration can be given to the removal of centre lines where carriageway widths do not permit the introduction of cycle lanes of adequate width whilst retaining two general traffic lanes. In addition to increasing the width available for people cycling, the technique also has a speed reducing effect for people driving motor vehicles, as there are no longer defined lanes in each direction. Where the need arises for on-coming motor vehicles to pass each other on a narrow carriageway, this is achieved by both people driving cars momentarily pulling over into their respective near-side advisory cycle lanes, having first checked to see they are clear of people cycling in the cycle lanes (see **section 11.25** and **table 11.1**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

Benefits

- Creates sufficient width for cycle lanes of the appropriate standard.
- Creates a safer and more comfortable environment than sub-standard cycle lanes.
- Achieves speed reduction for motor vehicles.
- Cost-effective, may be facilitated through maintenance works.
- Can be politically more acceptable than other more physical, traffic calming techniques.

Key design features

- Not suitable for roads with high motor traffic and HGV flows (maximum 4500 AADT and/or 500 vehicles per hour at peak times) with minimal HGV/bus traffic.
- Not suitable for roads with 85th percentile speeds over 22mph (see table 11.1).
- Unless only light vehicles are present, advisory cycle lanes should be used so that large vehicles can use the cycle lanes to pass one another.
- Requires adequate forward visibility.

Dimensions[16]

- a – Desirable minimum 2.0m, Absolute minimum 1.5m.
- b – Central general traffic lane 3m to 5.5m wide, preferably 4.1m – 4.8m.
- Where kerb-side parking is present, provide a buffer strip of 0.5 – 1m, or use inset parking bays (see DE305).

16 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- If the general traffic lanes are wider than 5.5m in total, the additional space should be used to increase the width of cycle lanes or provide a separated facility.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

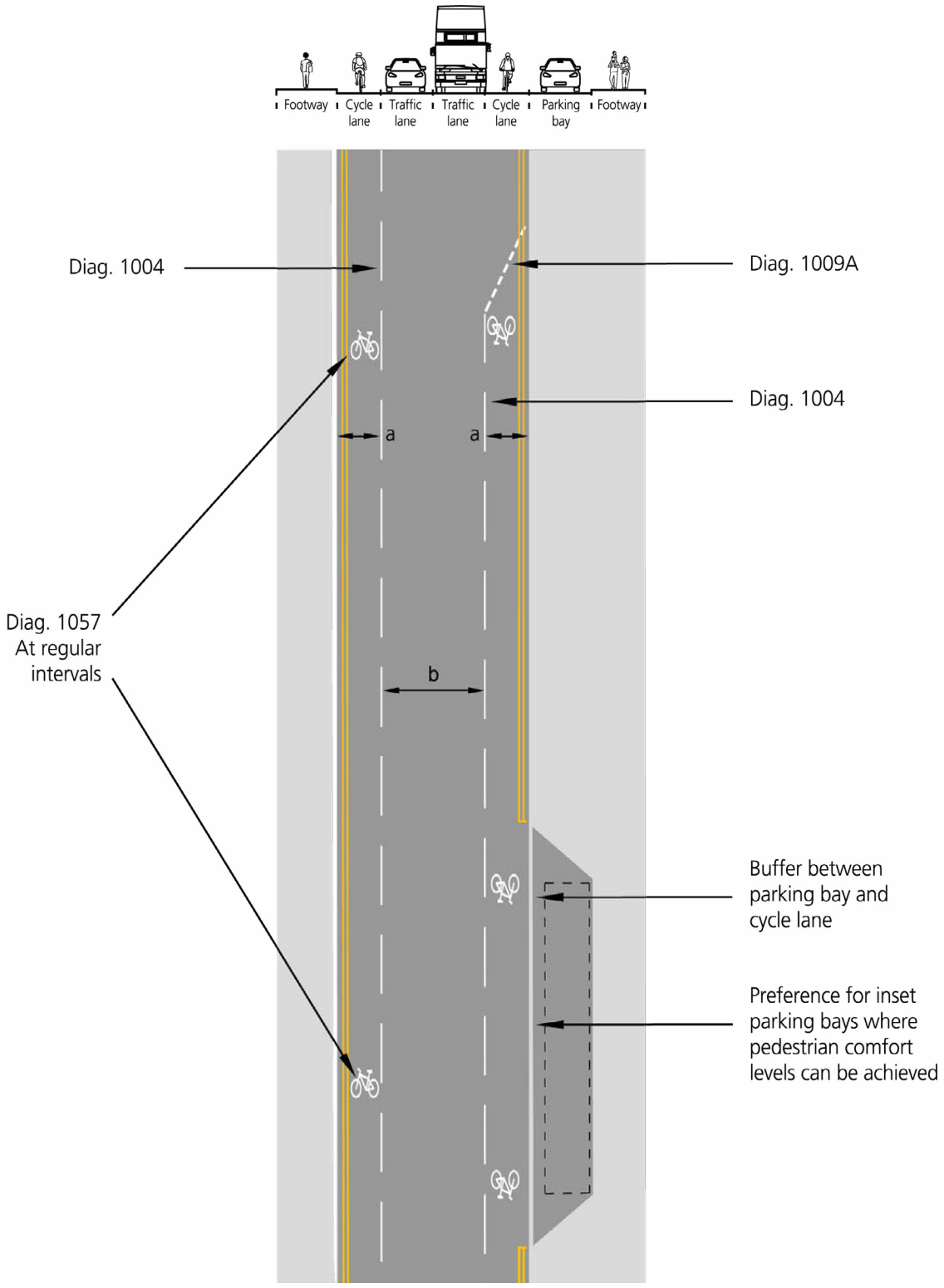
Further references

- Manual for Streets 2.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE307

Cycle lane with removal of centre lines

AADT:
<4500
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE307 | Previous DE number: DE307

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DE308 Cycle lane with light separation

Measure and brief description

A mandatory cycle lane may be reinforced by 'light separation' from the main carriageway to provide additional protection, for example intermittent physical features such as planters, wands (retroreflective self-righting bollards) or proprietary raised features which may be constructed from rubber, PVC or concrete. The fact that the obstacles are intermittent allows people using the cycle lane to manoeuvre between the cycle lane and the carriageway as necessary, avoids any impact on drainage and means that the design is cost effective and flexible (see **section 11.26** and **table 11.1**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

Benefits

- Increase comfort and safety levels for people choosing to cycle, as well as subjective safety.
- Can be used on roads with 85th percentile speeds of up to 33mph.
- Physical features deter people driving motor vehicles from encroaching into lane.
- People cycling can manoeuvre in and out of the lane to carry out right turns and for access.
- Low installation cost.
- Easily installed upgrade to existing cycle lanes.
- Lane widths can be easily adapted to suit future conditions, such as increased usage.
- Can also be used for contra-flow lanes and for two-way cycling.
- Avoids the need for drainage works.

Key design features

- Used in combination with a mandatory cycle lane (diagram 1049).
- Advisory cycle lane (diagram 1004) should not be used, as a key design principle is that people driving motor vehicles should not cross light separation.
- Physical features should be placed on the left-hand side of the cycle lane marking so that the marking can clearly be seen by people driving.
- Careful consideration is needed for the design of the physical feature – they need to be conspicuous and robust, but not mimic a road marking or sign.
- Continuity should be provided at bus stops.
- Gaps should be provided at side roads and accesses to allow people cycling to enter or exit the cycle lane.

Dimensions[17]

- a – Desirable minimum 2.0m, Absolute minimum 1.5m (see table 9.10).
- Where cycle flows are heavy (over 250 cyclists in the peak hour) and frequent overtaking occurs, widths should be increased to 2.5m.
- b – Separation features to be spaced at 2.5-10m intervals, or as recommended by the product manufacturer.

Other considerations

- If using bollards consideration should be given for illumination or reflective strips.
- Widths proposed should have in consideration that vertical features, such as wands, can reduce the effective width of the cycle lane.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- Light separation features can pose a trip hazard if selected and sited poorly. This can usually be mitigated by careful detailing to minimise trip-hazards in the separation units themselves, and by siting the units away from crossing points and desire lines. Care should also be given to make sure separation units are cane detectable for blind and partially sighted users.
- Light separation features can be selected to enhance the sense of place, including decorative bollards (for example pencil outside schools) and wands (for example floral wands) as well as planters and/or intermittent stone kerb separation for heritage scenarios.

Further references

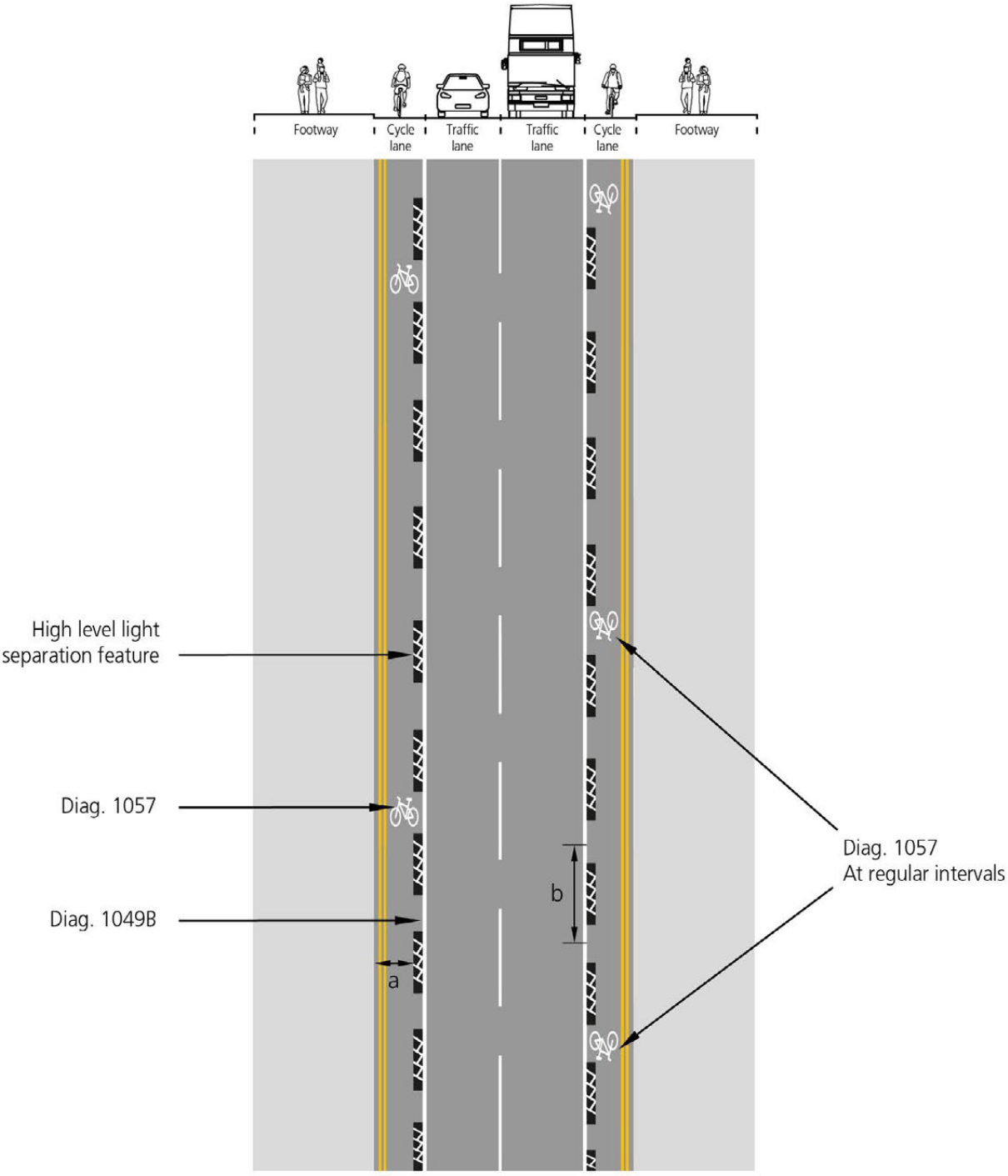
- Manual for Streets 2.
- Department for Transport – Traffic Signs Manual, Chapter 3.

17 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE308

Cycle lane with light separation

AADT:
Any
85th percentile speed:
<33mph



DE number: DE308	Previous DE number: DE308
Do Not Scale Drawing	Revision number: 3
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Llywodraeth Cymru
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DE309 Cycle lane with light separation at side road

Measure and brief description

Cycle lanes with light separation should continue across side road junctions to ensure continuity and help improve safety for people choosing to cycle. This can be achieved using a stretch of road marking diagram 1010, where the white line is broken, since continuous mandatory lanes across side road junctions are not permitted and in preference to advisory cycle lanes to diagram 1004 (see **section 11.26** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Improves conspicuity of people cycling at conflict point.
- Provides route continuity.

Key design features

- Light separation feature does not continue across side road.
- The use of diagram 1010 markings is recommended in preference to advisory cycle lanes to diagram 1004 to increase conspicuity.
- Cycle symbols (diagram 1057) may be placed in the cycle lane along the mouth of a junction.
- Coloured road surfacing may also be used in cycle lane to highlight the area of potential conflict.

Dimensions[18]

- a – Width on approach – desirable minimum 2m, absolute minimum 1.5m (see table 9.10).
- b – Width at side road should be at least 0.5m greater than on approaches.
- Separation features to be spaced at 2.5-10m intervals, or as recommended by the product manufacturer.
- Separation to cease no more than 5m from junction, depending on swept path requirements.

18 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Side road entry treatments (DE604) should also be considered, which provide raised carriageway tables and reduced corner radii at side road junctions. They help reduce turning vehicle speeds, making it safer and more accessible for people cycling passing the junction and people walking and wheeling crossing the side road.
- Entry to and from side roads should be reviewed to ensure appropriate sightlines and speeds to mitigate risks to people cycling from turning traffic.
- Side-road warning signs to diagrams 962.1 or 963.1 to warn people driving and people walking and wheeling respectively are generally unnecessary except for situations where contra-flow cycling is permitted.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

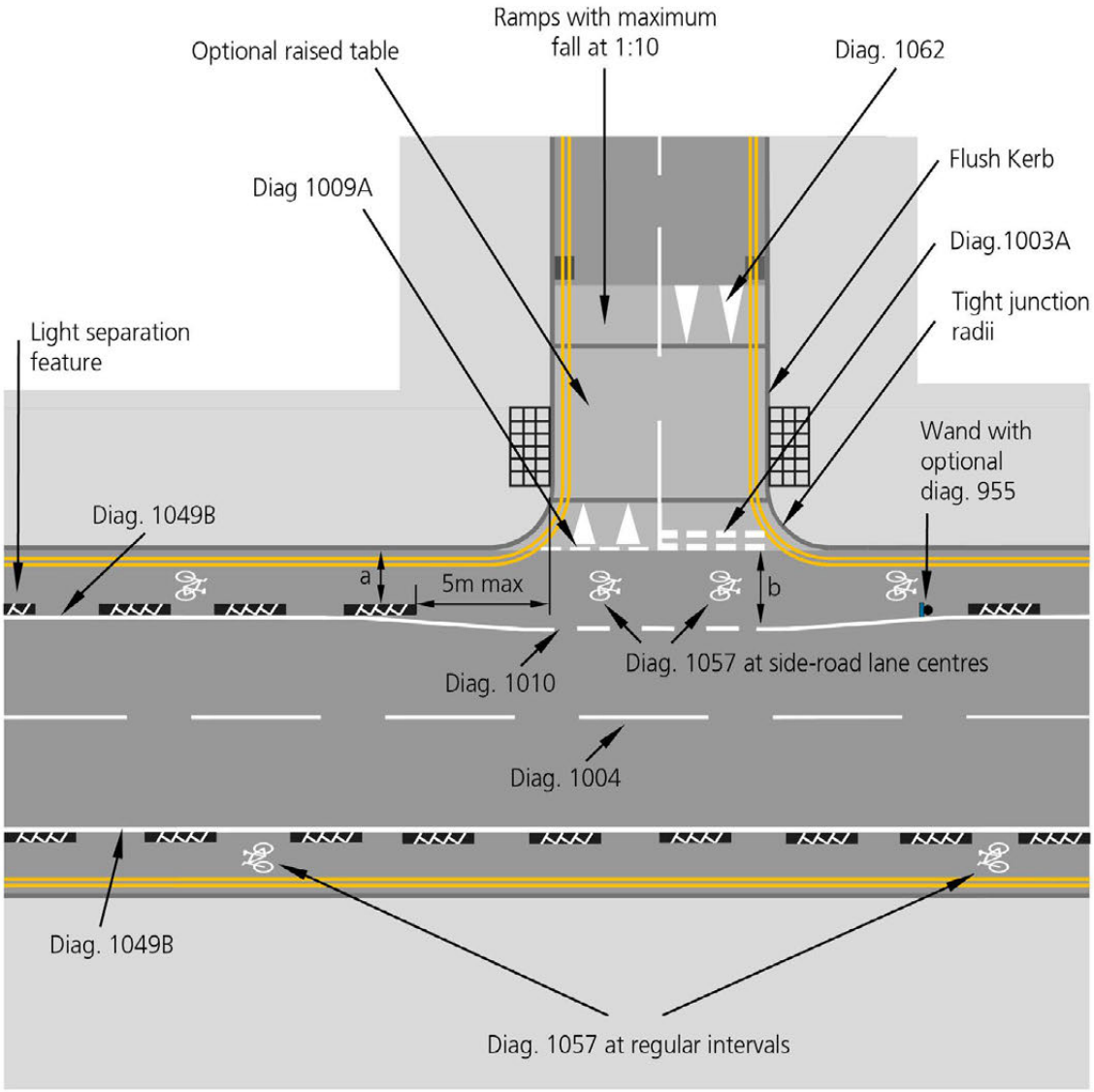
Further references

- Manual for Streets 2.
- TSRGD.
- Department for Transport – Traffic Signs Manual, Chapter 3.

DE309

Cycle lane with light separation at side road

AADT:
<2000
85th percentile speed:
<33mph



Note:
The AADT advised is due to the uncontrolled crossing on the detail.
With a controlled crossing, this detail is suitable for higher AADT (see table 11.1 and table 12.1).

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DE310 Cycle lane with light separation alongside parking/loading

Measure and brief description

Car parking/loading may be provided on the carriageway side of cycle lanes with light separation, with a buffer strip between the edge of the lane and the car parking/loading. Parking/loading should be prohibited in the vicinity of side road junctions and accesses so as to maintain adequate intervisibility (see **section 11.26** and **table 11.1**).

This detail can also be applied to stepped cycle tracks.

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Provides people cycling with additional protection from moving motor traffic.
- Prevents people parking cars in ways that cause obstruction to cycle lanes/tracks.
- Reduces likelihood and severity of people cycling being hit by people opening doors of motor vehicles into their path.
- Prevents people cycling getting trapped at the start of parking bay.

Key design features

- Car parking located on the carriageway side of the cycle lane/track.
- Buffer strip to be provided between the edge of the cycle track and the parking/loading spaces.
- Car parking/loading to be prohibited on the approach to side roads/accesses, so that people approaching by cycle are clearly visible to people driving motor vehicles coming out of the side road/access.

Dimensions[19]

- a – Desirable minimum 2.0m, absolute minimum 1.5m (see table 9.10).
- b – Buffer strip desirable minimum width of 1m, absolute minimum width 0.5m.
- 1:10 entry taper and 1:5 exit taper.
- Separation features to be spaced at 2.5-10.0m intervals, or as recommended by the product manufacturer.

19 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- A 2.0m wide cycle track can be reduced locally to 1.5m to allow a 0.5m wide dividing strip to be provided.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

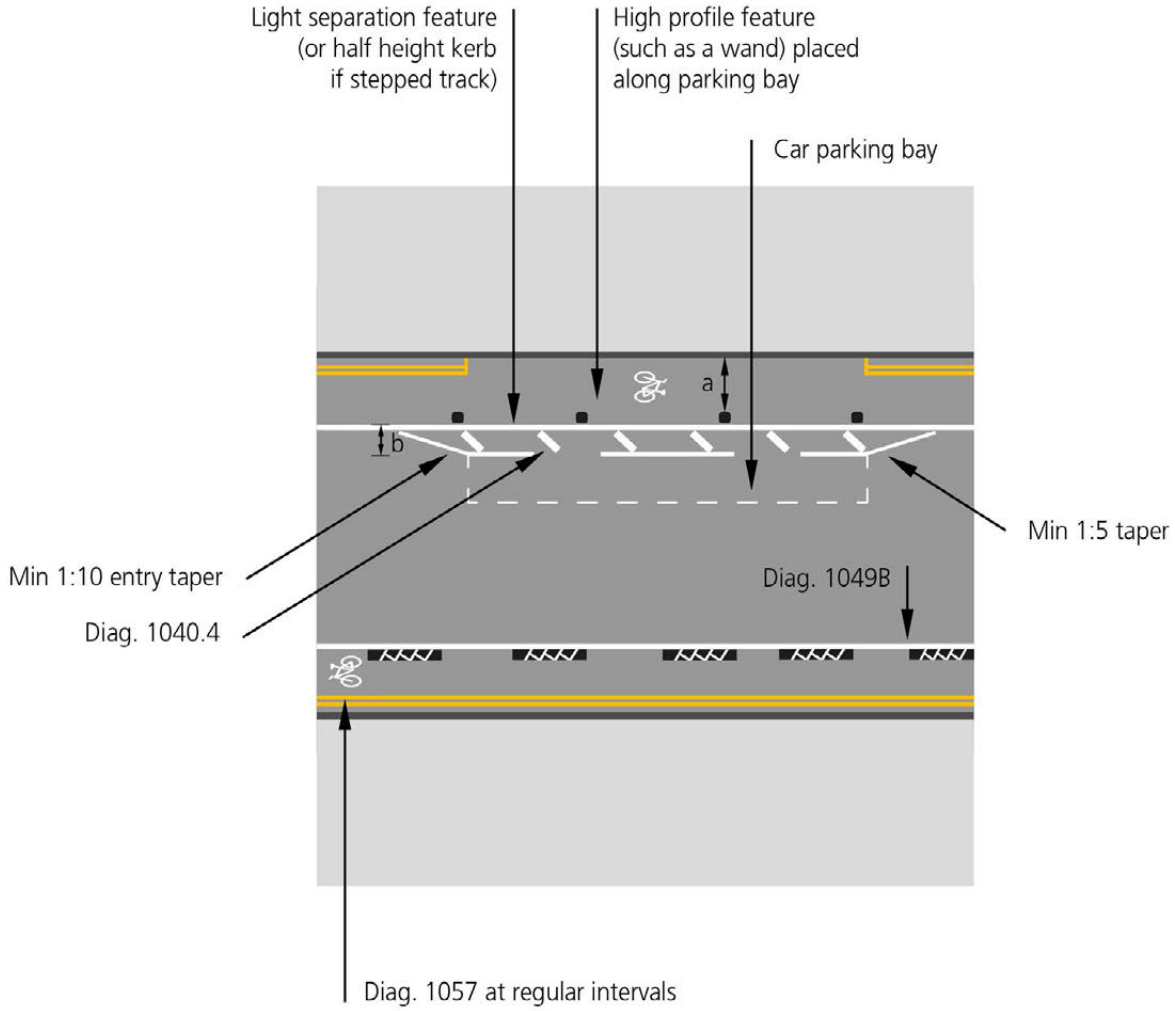
Further references

- Manual for Streets 2.
- TSRGD.

DE310

Cycle lane with light separation alongside parking/loading

AADT:
Any
85th percentile speed:
<33mph



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Welsh Government

DE number: DE310 | Previous DE number: DE310

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DE311 Stepped cycle track

Measure and brief description

Stepped cycle tracks have a surface raised above the carriageway but are below the level of the footway. They keep people using the cycle lane close to other traffic but provide more separation from it than a cycle lane or light separation does. People cycling can enter and leave the cycle track relatively easily where lowered kerbs or entrance kerbs are provided but the presence of a raised kerb edge along most of the length deters encroachment by people driving motor vehicles (see **section 11.27** and **table 11.1**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Increases comfort and safety levels for people choosing to use the cycle track as well as subjective safety.
- Can be used on roads with speed limits of up to 30mph and 85th percentile speed up to 33mph (see table 11.1).
- Level difference helps deter people driving motor vehicles from straying into the cycle track.
- Priority for people cycling over accesses to properties and side roads is maintained.
- Can reduce the amount of traffic signs and markings compared with mandatory cycle lanes.
- No TRO is required although this would be necessary for parking restrictions.
- Significantly reduces the risk of conflict between people cycling, and people walking and wheeling, compared with shared use paths.

Key design features

- Stepped cycle tracks usually operate one-way, in the same direction as motor traffic flow.
- Cycle tracks will be provided through reallocation of road space from the carriageway or verge in preference to reducing footway widths.
- Lowered to merge with the carriageway at junctions or other areas where people cycling need to access the general traffic lanes.
- Continuity should be provided at bus stops.
- Stepped tracks at side roads retain priority for people cycling over motor traffic.
- Dropped or access kerbs should be provided at side roads and accesses to allow people cycling to enter or exit the cycle track.

Dimensions[20]

- a – Desirable minimum 2.0m, Absolute minimum 1.5m (see table 9.10).
- Where cycle flows are heavy (over 250 cyclists in the peak hour) and frequent overtaking occurs, widths should be increased to 2.5m.
- Minimum kerb upstands should generally be 50mm on the carriageway side, and 25mm on the footway side.
- Lamp columns, sign posts, etc. should be placed no closer than 0.5m from any stepped cycle lane.

Other considerations

- New drainage facilities will need to be introduced into the narrowed carriageway while existing grates will need to be raised to cycle track level. Cycle friendly drainage grates should be used for both.
- Can be used as part of centre line removal projects.
- There is no particular requirement to sign stepped tracks (or use coloured surfacing). In many cases, the kerb upstand itself will suffice to deter people driving motor vehicles from entering. However, the use of a mandatory lane placed on the carriageway side of the kerb could be considered if encroachment by people driving motor vehicles (including parking) becomes a problem. Coloured surfacing (with good skid resistance) is only recommended at conflict points (such as junctions).
- See DE312 for details of Stepped Cycle Tracks at Side Roads.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

Further references

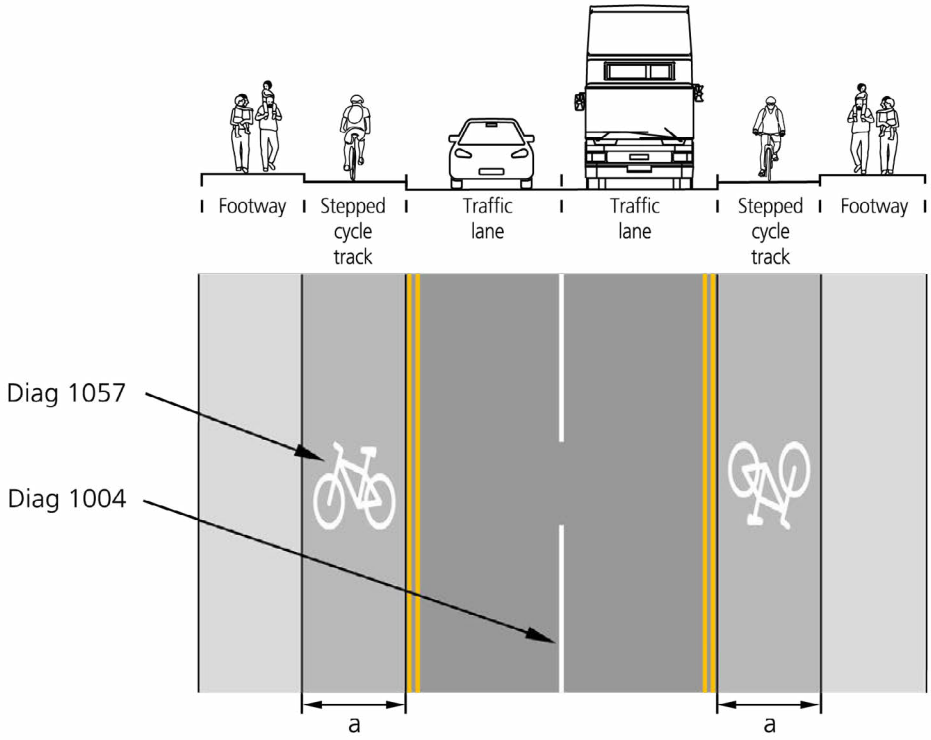
- Manual for Streets 2.
- TSRGD.

20 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE311

Stepped cycle track

AADT:
Any
85th percentile speed:
<33mph



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Welsh Government

DE number: DE311 | Previous DE number: DE311

Do Not Scale Drawing | Revision number: 3

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DE312 Stepped cycle track at side road

Measure and brief description

Stepped tracks are still considered part of the carriageway, and normally operate one-way in the same direction as general traffic, they should cross side roads in the same position as a cycle lane, ensuring route continuity (see **section 11.27** and **table 11.1**). One-way stepped tracks should normally retain priority over side roads, this can be achieved by:

- Continuing the track through the junction with a flush kerb.
- Stopping the stepped track within 5.0m of the junction on either side with a raised crossing for turning traffic and tight corner radii at the side road.
- Transitioning the stepped track to a cycle lane 20m-30m in advance of the side road (in which case refer to **DE306**).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Benefits

- Helps the conspicuity of people cycling at conflict points.
- Helps with route continuity.

Key design features

- Side road give-way markings should be set back from the cycle track.
- TSRGD cycle symbols (diagram 1057) should be placed in the cycle track/lane across the mouth of a junction.
- Coloured road surfacing may also be used in cycle track/lane to highlight the area of potential conflict.
- Care needs to be taken where stepped tracks pass private accesses, to ensure people driving motor vehicles emerging from the access can see people riding cycles. People cycling should not normally be required to give way to vehicles using accesses.

Dimensions[21]

- a – Width on approach – desirable minimum 2.0m, absolute minimum 1.5m (see table 9.10).

21 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Side road entry treatments (DE604) should also be considered, which provide raised carriageway tables and reduced corner radii at side road junctions. They help reduce turning vehicle speeds, making it safer and more accessible for people cycling through the junction and people walking or wheeling across the side road.
- Entry to and from side roads should be reviewed to ensure appropriate sightlines and speeds to mitigate risks to people walking, wheeling or cycling from people manoeuvring motor vehicles through the junction.
- Side-road warning signs to diagrams 962.1 or 963.1 to warn people driving, and walking or wheeling respectively are generally unnecessary except for situations where contra-flow cycling is permitted.
- Widening of the cycle lane at the junction can also be considered, as per DE306.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

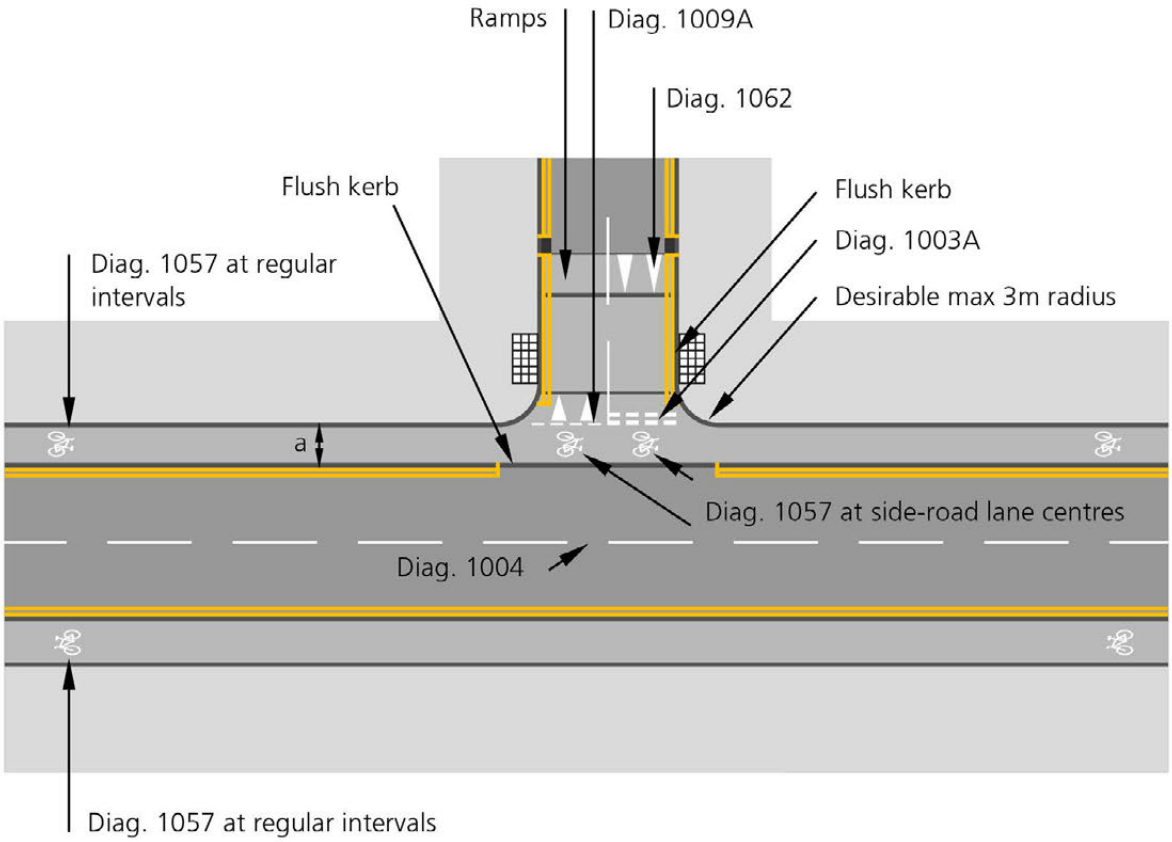
Further references

- Manual for Streets 2.
- TSRGD.

DE312

Stepped cycle track at side road

AADT:
<2000
85th percentile speed:
<33mph



Note:
The AADT advised is due to the uncontrolled crossing on the detail.
With a controlled crossing, this detail is suitable for higher AADT (see table 11.1 and table 12.1).

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DE313 Cycle track alongside road, separated from footway

Measure and brief description

Where motor traffic volumes and/or speeds are too high for cycle lanes, light separation or stepped tracks, physical separation from motor traffic may be appropriate to provide people choosing to cycle with safe and comfortable space, through the provision of separate cycle tracks and footways. Cycle tracks will be provided through reallocation of road space from the carriageway or verge in preference to reducing footway widths.

Physical separation from people walking and wheeling is generally preferred where widths can be achieved, using a level difference or verge. Barriers between cycle tracks and footways are not desirable because they limit the effective width of the paths and can be hazardous. Segregation using only simple white lines (diagram 1049) is not detectable for blind users. A raised white line delineator (diagram 1049.1), is an option that may be acceptable alongside faster and busier main roads where there is plenty of space and demand is light. Where demand is likely to be greater, it is preferable to use a stepped track (see **DE311** and **DE312**) (see **section 11.28** and **table 11.1**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

Benefits

- Provides routes which are free from conflict with people driving motor vehicles.
- Separated paths allow people to move at their own desired pace and improve comfort and perceived safety.

Key design features

- The cycle track should normally be located between carriageway and footway.
- Footways and cycle tracks should be continuous across private accesses, preferably with the use of entrance kerbs.
- People walking or wheeling require regular crossing points with flush kerbs between the cycle track and the carriageway; tactile paving should be provided (see the guidance on the use of tactile paving).
- Cycle tracks should not deflect more than 45° and changes in level should be avoided with the use of entry kerbs, for example.
- Machine-laid black bituminous surfacing should be used as it will make cycle journeys safer, more comfortable and helps distinguish cycle tracks from adjacent footways that should be surfaced by paviours or slabs.

- Lamp columns, sign posts and other street furniture should not be placed in cycle tracks.
- Centre lines should be marked on two-way cycle tracks.
- Dropped or access kerbs should be provided at side roads and accesses to allow people cycling to enter or exit the cycle track.

Dimensions[22]

- a – Cycle track width (two-way) should be sufficient to accommodate the forecast level of use with a minimum of (see table 9.10):
    - Desirable minimum 3m, where flows are under 250/hr, 4.0m for cycle flows over 250/hr. Cycle tracks should include additional width where they are bounded by vertical features. Additional width required is (see section 9.18):
        - Kerb up to 150mm high: add 200mm.
        - Vertical feature 150-600mm high: add 250mm.
        - Vertical feature above 600mm high: add 500mm.
- b – In addition to the path width above, a margin strip separating the cycle track from the carriageway is recommended (see table 9.11):
    - Desirable minimum 0.5m with 85th percentile speeds up to 33mph.
    - Desirable minimum 1.0m with 85th percentile speeds up to 44mph and wider if the speeds are higher.
- c – The width of the footway should reflect the level and type of use, based on level of service, Desirable minimum 2.0m width, increasing to 3.5m width where there is frequent use by groups, for example near schools, transport interchanges or other locally significant trip attractors. 1.5m may be acceptable over short lengths (see DE101).
- If a verge is used to separate footways from cycle tracks it should be a minimum of 1.0m wide to enable mowing.

Other considerations

- Generally cycle tracks alongside the carriageway will either be two-way, usually on one side of the road, or one-way on both sides of the road. Junctions with two-way cycle tracks need careful design, to allow people walking, wheeling and cycling to move safely in all directions.
- Care needs to be taken where a cycle track passes private accesses, to ensure people driving motor vehicles emerging from the access can see people walking, wheeling and cycling.
- Two-way tracks are therefore best suited to routes that have few side road junctions and accesses.
- Use of white lining to provide a buffer between the cycle track and carriageway is not recommended in unlit areas, as this could be misinterpreted as marking the edge of carriageway by passing motorists, who are then at risk of striking the kerb and losing control.

22 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Upright signs to indicate cycle track should be avoided as they create clutter. Where they are absolutely necessary, they should preferably be located in the verge or footway, without compromising width for people walking and wheeling.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

Further references

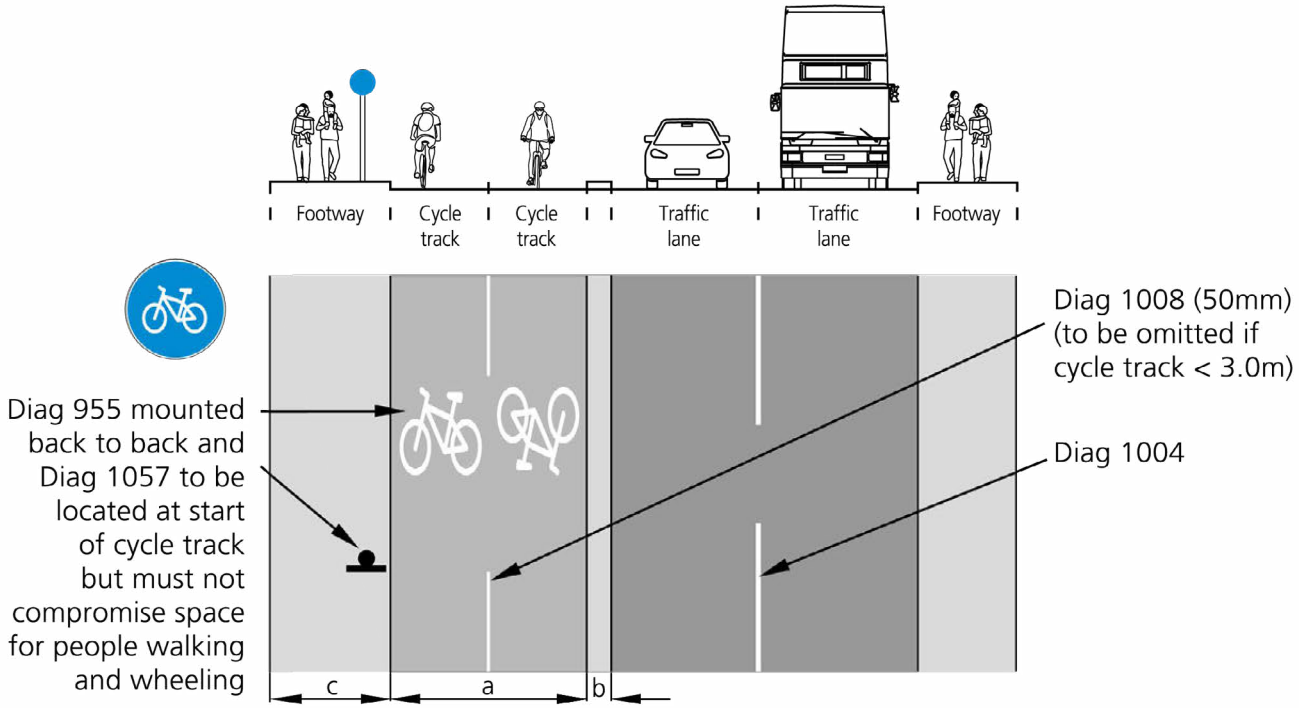
- Manual for Streets 2.
- TSRGD.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.

DE313

Cycle track alongside road, separated from footway

AADT:
Any

85th percentile speed:
Any



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Welsh Government

DE number: DE313 | Previous DE number: DE313

Do Not Scale Drawing | Revision number: 3

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DE314 Two-way cycle track in centre of carriageway

Measure and brief description

Two-way cycle tracks in the centre of the carriageway can offer a good level of service. People cycling are in a highly visible location which has no conflict with parked vehicles, bus stops or loading, or vehicles turning into and out of side road junctions or accesses. Access to the track (at each end and along its length) can be via priority or signal controlled crossings, or signal controlled junctions with cycle stages. Where motor traffic volumes are not high, mini or compact roundabouts are also an option, since people cycling will be arriving into and leaving from the junction in a dominant position (see **section 11.29** and **table 11.1**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

- No conflict with kerbside activity.
- High profile facility.

Key design features

- Two-way cycle track should be protected with kerb upstands (DE311, DE313) or with light separation (DE308).
- Tracks can be provided in wide central reservations, including on higher speed roads (see table 11.1).
- Similarly, one-way light-separated lanes, stepped tracks or tracks can be provided adjacent to the central reservation on dual carriageways.
- Cycle priority to be maintained across any lightly-trafficked central reservation gaps.
- U-turns at central reservation gaps should be banned.
- Dropped or access kerbs should be provided at side roads and accesses to allow people cycling to enter or exit the cycle track.

Dimensions[23]

- Cycle track width should be sufficient to accommodate the forecast level of cycle use with a minimum of:
    - Desirable minimum 3.0m, where the peak hour cycle flow is under 250/hr, 4.0m for peak hour cycle flows over 250/hr (see table 9.10).

23 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- In addition to the path width above, a margin strip separating the cycle track from the carriageway is recommended (see table 9.11):
  - Desirable minimum 0.5m with 85th percentile speeds up to 33mph.
  - Desirable minimum 1.0m with 85th percentile speeds up to 44mph or wider if speeds are higher.

Other considerations

- Provision should be made for people walking or wheeling making crossing movements at regular intervals.
- Difficulties in joining or leaving the track at points along it mean this arrangement is unlikely to be suitable for roads with many destinations along them (such as shopping streets) or with frequent side-road junctions, unless the motor traffic is light and/or very slow-moving.
- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).

Further references

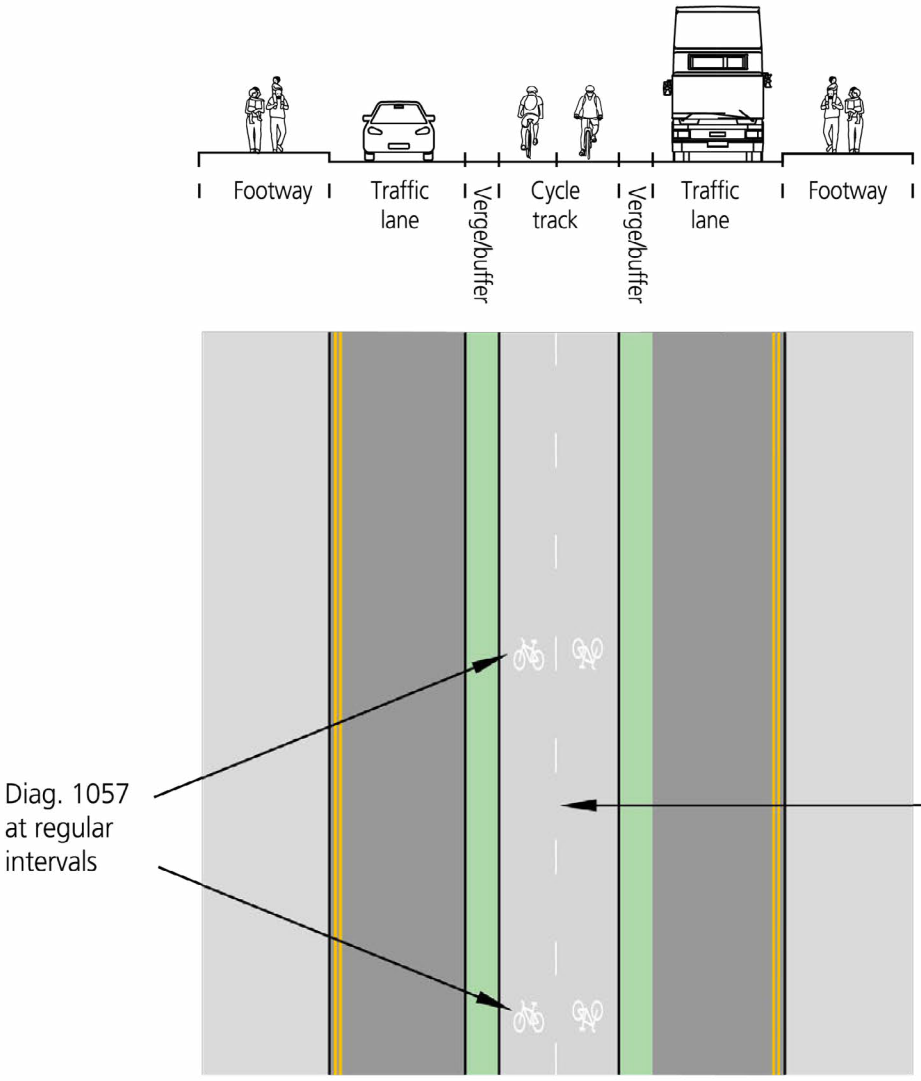
- Manual for Streets 2.
- TSRGD.

DE314

Two-way cycle track in centre of carriageway

AADT:
Any

85th percentile speed:
Any



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Welsh Government

DE number: DE314 | Previous DE number: DE314

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DE315 Transition between carriageway and cycle track

Measure and brief description

'Merge' transitions involve people cycling joining the carriageway, a cycle lane, light separated lane or stepped track, from motor traffic-free cycle track. At 'diverge' transitions, people cycling carry out the reverse manoeuvre to join a parallel cycle track. The design of these transitions should provide a direct and safe route for people cycling which does not require them to deviate significantly from their direction of travel, nor cross a kerb at an angle. At merges they should not need to give way to general traffic and be given space free from motor vehicles to enter into, defined by a cycle lane, light separation or a stepped track. The design should ensure that people cycling are clearly visible to people driving and that they are aware that people cycling are likely to be re-joining the carriageway.

As well as providing transitions between on and off-road facilities along links, these transitions can be used on the approaches to controlled crossings or junctions to enable people cycling to leave the carriageway to use a facility. The design should minimise any conflict with people walking and wheeling and other people cycling waiting at the crossing point (see **section 11.30**).

Before proposing this design element it is recommended to check in **figure 11.1** ATNM Link Selector that this is the most appropriate infrastructure to use.

Benefits

- A smooth transition when joining or leaving the carriageway, without the need to give way or stop, will make a facility more comfortable and safe.

Key design features

- Build-outs can be used to push people driving vehicles away from people cycling rejoining the carriageway.
- Designs should take account of people cycling who are already using the carriageway at the merge point.
- People cycling leaving the carriageway should not be brought into conflict with people who are walking or wheeling.
- People cycling should cross any kerbs at 90 degrees and these should be flush.
- Any tapers should be no sharper than 1:10.

Dimensions[24]

- a – Width – desirable minimum 2m, absolute minimum 1.5m (see table 9.10).
- b – Desirable margin strip separating cycle track from carriageway (see table 9.11).
- c – The width of the footway should reflect the level and type of use, based on level of service, desirable minimum 2m width, increasing to 3.5m width where there is frequent use by groups. 1.5m may be acceptable over short lengths (see DE101).

Other considerations

- Tactile paving should be provided at transition points (see guidance on the use of tactile paving surfaces), when people cycling start/stop sharing the space with people walking and wheeling, or at crossing points (over the carriageway or cycle tracks).
- Transition to carriageway should be flush with no upstand.
- It is preferable to continue the cycle lane with light separation, even if only for a short section, not least because this prevents the exit-point from the cycle track from being blocked by people parking vehicles inconsiderately.
- Other types of transitions between cycle tracks and carriageways are possible, as shown in figure 11.21 and in ATE Rural Design Guide.

Further references

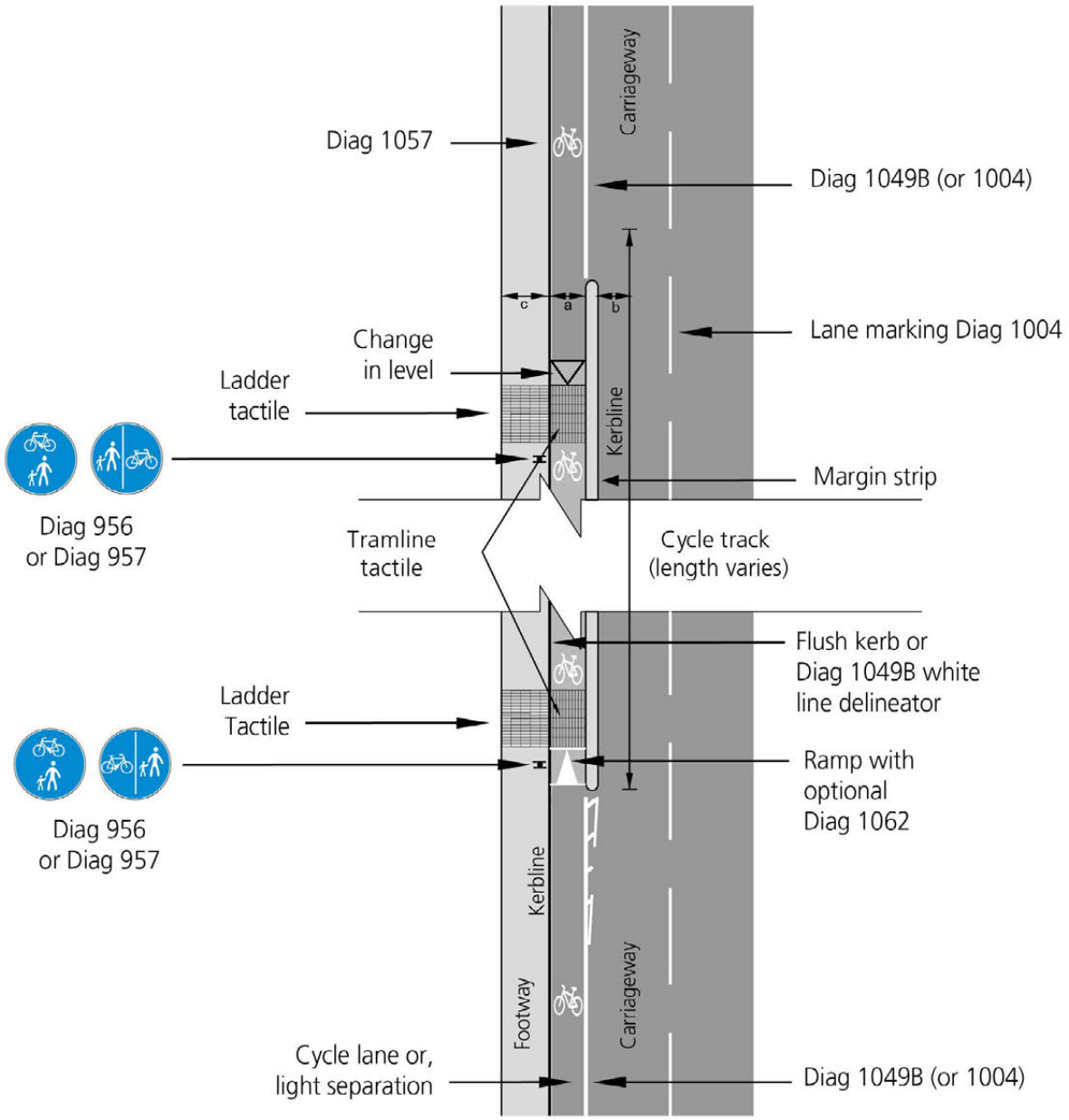
- TSRGD.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Active Travel England – Rural Design Guide.

24 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE315

Transition between carriageway and cycle track

AADT:
Any
85th percentile speed:
<33mph



Note:
1 – The values for AADT and 85th percentile speed recommended on this detail relate to a design with light separation. When applied to a cycle lane, the values will differ (see table 11.1).
2 – This arrangement of tactiles is only to be used where people walking and wheeling start/stop sharing the space with people cycling. If there is no shared space and there is a kerb identifiable by blind or partially sighted people (minimum 60mm) tactiles are not required (see guidance on the use of tactile paving surfaces).

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DE401 Shared use path alongside road

Measure and brief description

As outlined in the ATNM Link Design Selector (**figure 11.1**), when an active travel route involves fewer points of conflict (with less than 20% of the route directly adjacent to developed frontages with property access) and where traffic speeds and volumes are unsuitable for on-road cycling (more than 2500AADT or over 22mph 85th percentile speed), a shared path for walking, wheeling, and cycling may be appropriate.

In locations where these conditions are not met, converting footways into shared-use paths should be avoided and considered only as a last resort (for example, for short sections to join up routes, when the space is insufficient for segregated provision). Where motor traffic speeds 33mph or above, a horizontal buffer between the carriageway and the active travel route is recommended (refer to **sections 11.16** and **9.19** for guidance).

Before proposing this design element it is recommended to check with the **ATNM Link Selector** that this is the most appropriate infrastructure to use.

Key design features

- Shared use paths should remain level and uninterrupted at private accesses, by using access kerbs, for example.
- People walking and wheeling require regular crossing points with flush kerbs; tactile paving should be provided (refer to the guidance on the use of tactile paving).
- Shared use paths should not deflect more than 45º and should have a curve radius above 2.0m.
- Machine-laid bituminous surfacing should be used as it will make cycle journeys safer, more comfortable, and helps distinguish shared use paths from nearby footpaths and footways, which should be surfaced by paviours or slabs.
- When possible, lamp columns, signs (including diagram 956), and other street furniture should not be placed in shared use paths, but on a close verge, ideally 0.5m from the boundary of the path.
- Shared use paths are not recommended in locations where there is a high proportion of vulnerable users, such as outside hospitals, care homes and schools.

Dimensions[25]

- a – Width requirements are set out in table 11.3.
- Shared use paths should include additional width where they are bounded by vertical features. Additional width required is (see section 9.18):
    - Kerb up to 150mm high: add 200mm.
    - Vertical feature 150-600mm high: add 250mm.
    - Vertical feature above 600mm high: add 500mm.

25 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- b – In addition to the path width above, a margin strip separating the shared use path from the carriageway is recommended (see section 9.19):
    - Desirable minimum 0.5m with 85th percentile speeds up to 33mph.
    - Desirable minimum 1.0m with 85th percentile speeds up to 44mph and wider with higher speeds.

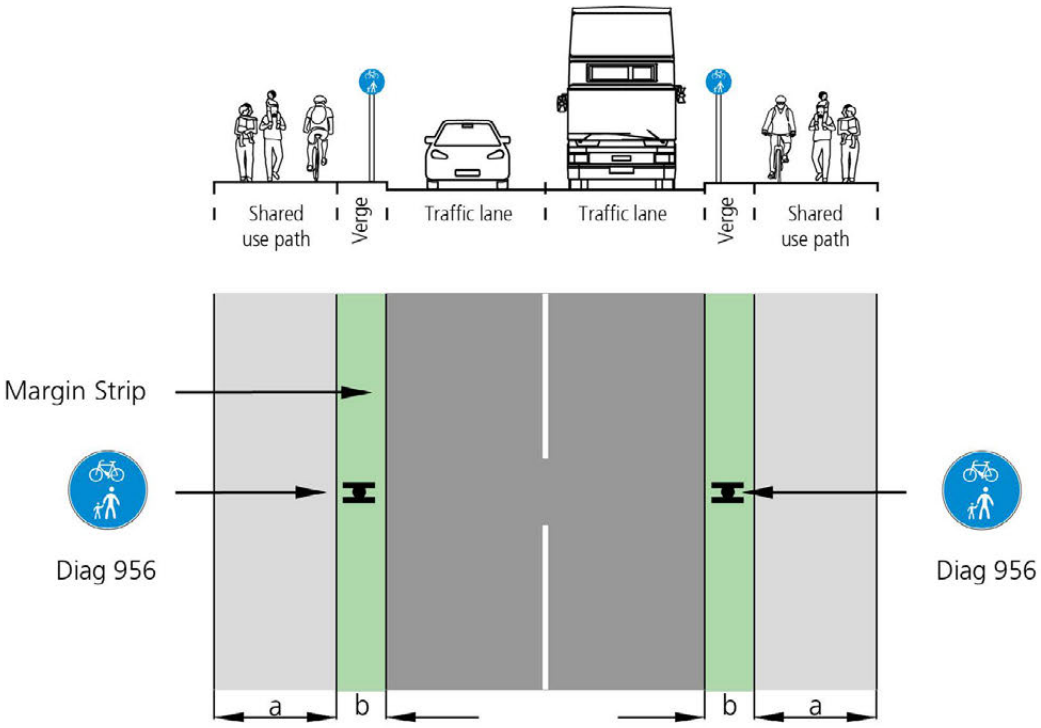
Other considerations

- Care needs to be taken where a shared use path passes private accesses, to ensure drivers emerging from the access can see people walking, wheeling and cycling.
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted from the early stages of design.
- Avoid using white lining as a buffer in unlit areas, as motorists may mistake them for the carriageway edge and risk hitting the kerb.
- Careful assessment is essential before introducing a shared use path. Use the flowchart below to guide your evaluation of its suitability.

Further references

- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.

DE401	Shared use path, alongside road	**AADT:** Any **85th percentile speed:** Any



Llywodraeth Cymru Welsh Government	DE number: DE401	Previous DE number: DE401
	Do Not Scale Drawing	Revision number: 4
	Copyright: Welsh Government	

DE402 Separated pedestrian and cycle track, away from road

Measure and brief description

Routes away from the road can offer high-quality connections for people walking, wheeling, and cycling. Wherever possible, provide separate, parallel paths wide enough to accommodate each mode without encroachment. Physical segregation, such as a level change or verge, is preferable to barriers, which reduce usable width and can pose hazards for people cycling.

Simple white-line markings (diagram 1049) should be avoided because they're undetectable to blind or partially sighted users and risk being mistaken for the carriageway edge. Raised white-line delineators (diagram 1049.1) also prove ineffective in practice – often ignored unless cycle flows are very high or path widths are generous – and therefore should be avoided (see **section 11.31**).

Benefits

- Provides routes which are free from conflict with motor traffic.
- Separated paths allow different modes to move at their own desired pace and improve comfort and perceived (as well as actual) safety for all users.

Key design features

- Footpaths and cycle tracks should be continuous.
- Flush kerbs with tactile paving at crossings (see the guidance on the use of tactile paving surfaces).
- Cycle tracks should not deflect more than 45° from the desire line and changes in height should be avoided. At vehicle crossovers, the use of access kerbs is recommended.
- Machine-laid black bituminous surfacing should be used as it will make cycle journeys safer, more comfortable and helps distinguish cycle tracks from adjacent footways that should be surfaced by paviours or slabs.

Dimensions[26]

- a – Footpath widths should be based on anticipated usage. A minimum of 2.0 m is desirable for general pedestrian flow, increasing to at least 3.5m in areas with frequent group movements. Over short stretches, a reduced width of 1.5m may be acceptable (see DE101).

26 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- b – Cycle track width should be sufficient to accommodate the forecast level of use with a minimum of (see table 9.10):
    - Desirable minimum 3.0m where peak flow hour is 50-250/hr.
    - Desirable minimum 4.0m for cycle flows over 250/hr.
- Cycle tracks should include additional width where they are bounded by vertical features. Additional width required is (see section 9.18):
    - Kerb up to 150mm high: add 200mm.
    - Vertical feature 150-600mm high: add 250mm.
    - Vertical feature above 600mm high: add 500mm.
- Verges separating pedestrian and cycle routes should be a minimum of 1.0m wide.

Other considerations

- Centre lines should generally be marked on two-way cycle tracks.
- Lamp columns and other street furniture should be set back at least 0.5m from the edge of either track.
- Path geometry, particularly radii, forward visibility and gradient, should reflect the user need criteria set out in chapter 9 and should also accommodate different types of cycles, including cycles with a trailer and non standard.
- Paths used for utility journeys (all active travel routes) should normally be lit as otherwise they are likely to exclude some groups (such as women and girls) at certain times of the day.
- Access control features should not be installed.
- Reductions towards absolute minimum widths for footways and cycle tracks should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority; see manual for streets).

Further references

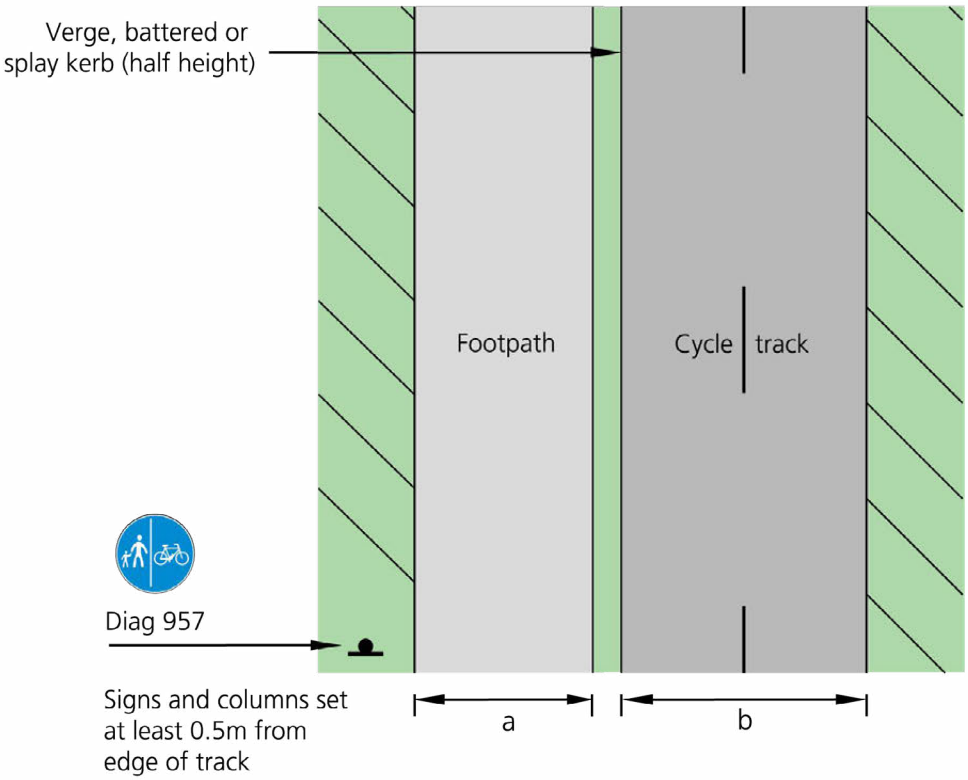
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.
- Manual for Streets 2.

DE402

Separated pedestrian and cycle track, away from road

AADT:
Any

85th percentile speed:
Any



Llywodraeth Cymru
Welsh Government

DE number: DE402 | Previous DE number: DE402

Do Not Scale Drawing | Revision number: 4

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DE403 Shared use path, away from road

Measure and brief description

Routes away from the road can provide a very good quality link for all modes of active travel. Where peak user numbers are less than 100 per hour, and less than 20% of the proposed route has developed frontages on both sides, a facility that is shared between cyclists and pedestrians can be appropriate. Sufficient width should be provided for different user groups to interact safely and in comfort. Engaging disability advocacy groups alongside walking, wheeling, and cycling community representatives from the earliest stages of planning is essential when designing a shared-use path (see **section 11.32**).

Key design features

- Shared use paths should be continuous.
- Flush kerbs with tactile paving at crossings (see the guidance on the use of tactile paving surfaces).
- Shared use paths should not deflect more than 45° from the desire line and constant changes in height should be avoided.
- Machine-laid bituminous surfacing should be used as it will make journeys safer and more comfortable.
- Shared used paths are not recommended in locations where there is a high proportion of vulnerable users, such as outside hospitals, care homes and schools.

Dimensions[27]

- a – Width requirements are set out in table 11.3.
- Shared use paths should include additional width where they are bounded by vertical features. Only where there is open space on both sides is it is practical to use the whole track width to cycle. Additional width required is (see section 9.18):
    - Kerb up to 150mm high: add 200mm.
    - Vertical feature 150-600mm high: add 250mm.
    - Vertical feature above 600mm high: add 500mm.
- Where possible clear verges (1m wide) should be provided alongside pedestrian and cycle routes.

27 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Lamp columns and other street furniture should be set back at least 0.5m from the edge of the path.
- Path geometry, particularly radii, forward visibility and gradient, should reflect the user need criteria set out in chapter 9.
- Paths used for utility journeys (all active travel routes) should normally be lit as otherwise they are likely to exclude some groups (such as women and girls) at certain times of the day.
- Access control features should not be installed.
- The British Horse Society recommends a desirable minimum width of 5.0m for new bridleways, which would be shared with people that are walking, wheeling and cycling.
- Careful assessment is essential before introducing a shared use path. Use the flowchart below to guide your evaluation of its suitability.

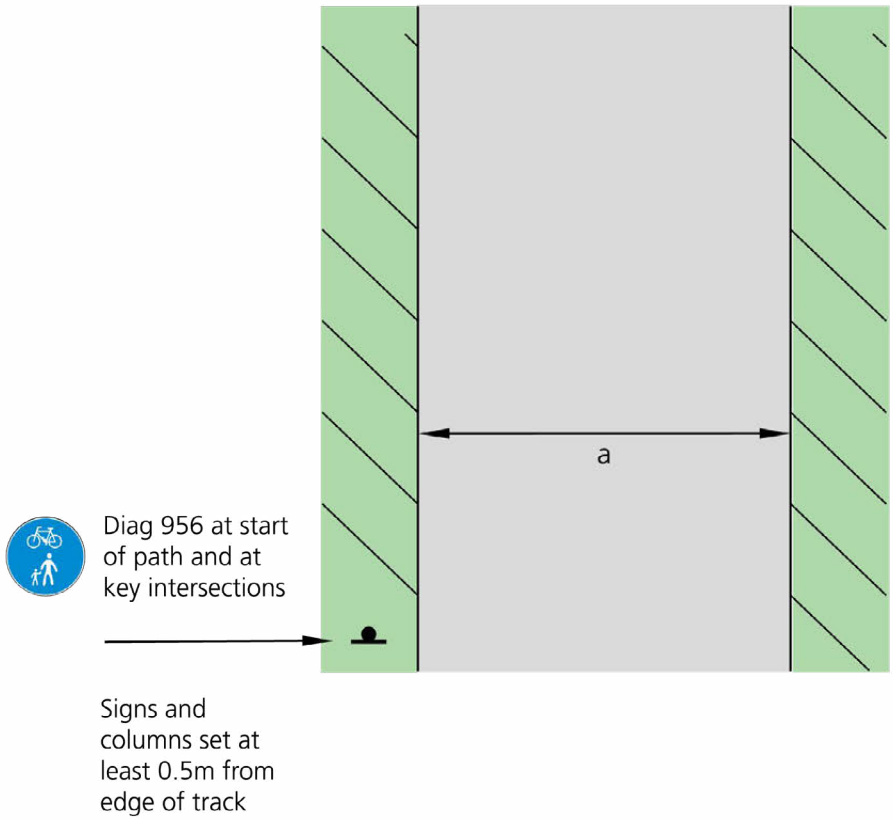
Further references

- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.

DE403

Shared use path, away from road

AADT:
Any
85th percentile speed:
Any



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DE501 Bus stop: cycle lane continuation

Measure and brief description

People cycling should be enabled to pass stationary buses safely. TSRGD advises that where cycle lanes that are in the usual position next to the kerb encounter bus stops they should be terminated and begin again after the bus cage. This requires that people who are cycling move out into general traffic, which does not meet their needs.

The provision of a cycle lane continuing around the bus stop provides a preferable solution. This design should only be proposed in areas where measured motor traffic speeds are below 22mph and where bus frequency is low. Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered, such as cycling groups and bus companies. Please refer to the accompanying text in section 11.34.

Benefits

- Maintains route continuity.
- It provides space between a person cycling and the bus that they are overtaking.
- Best suited at bus stops with low bus frequency.

Key design features

- Marked route for people cycling to bypass bus cage, with contrasting colour to highlight the potential conflict point.
- Sufficient width for cycle lane and buffer strip past bus cage.

Dimensions[28]

- a – Cycle lane: desirable minimum 2.0m, absolute minimum 1.5m (see table 9.10).
- b – General traffic or bus lane width: desirable minimum 3.0m.
- c – Bus cage width: desirable minimum 3.0m, absolute minimum 2.7m.
- d – Buffer strip: desirable minimum 2.0m, absolute minimum 1.5m.

28 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Also compatible with one-way light separated cycle lanes and stepped tracks, which become cycle lanes past the bus stop. Not compatible with 2 way cycle provision.
- Variants of this design can be considered where buses are provided with full or half width bus laybys.
- Cycle lanes are only to be used in low motor traffic flows and speeds (see table 11.1) as the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure, and advisory cycle lanes increase the risk of injury (Adams & Aldred).
- Some people (for example, people who have less experience cycling or carers with children) might feel unsafe and/or uncomfortable cycling around buses. This arrangement can therefore exclude a large number of potential users.
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers and drivers is also recommended.
- A specific designer's risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.

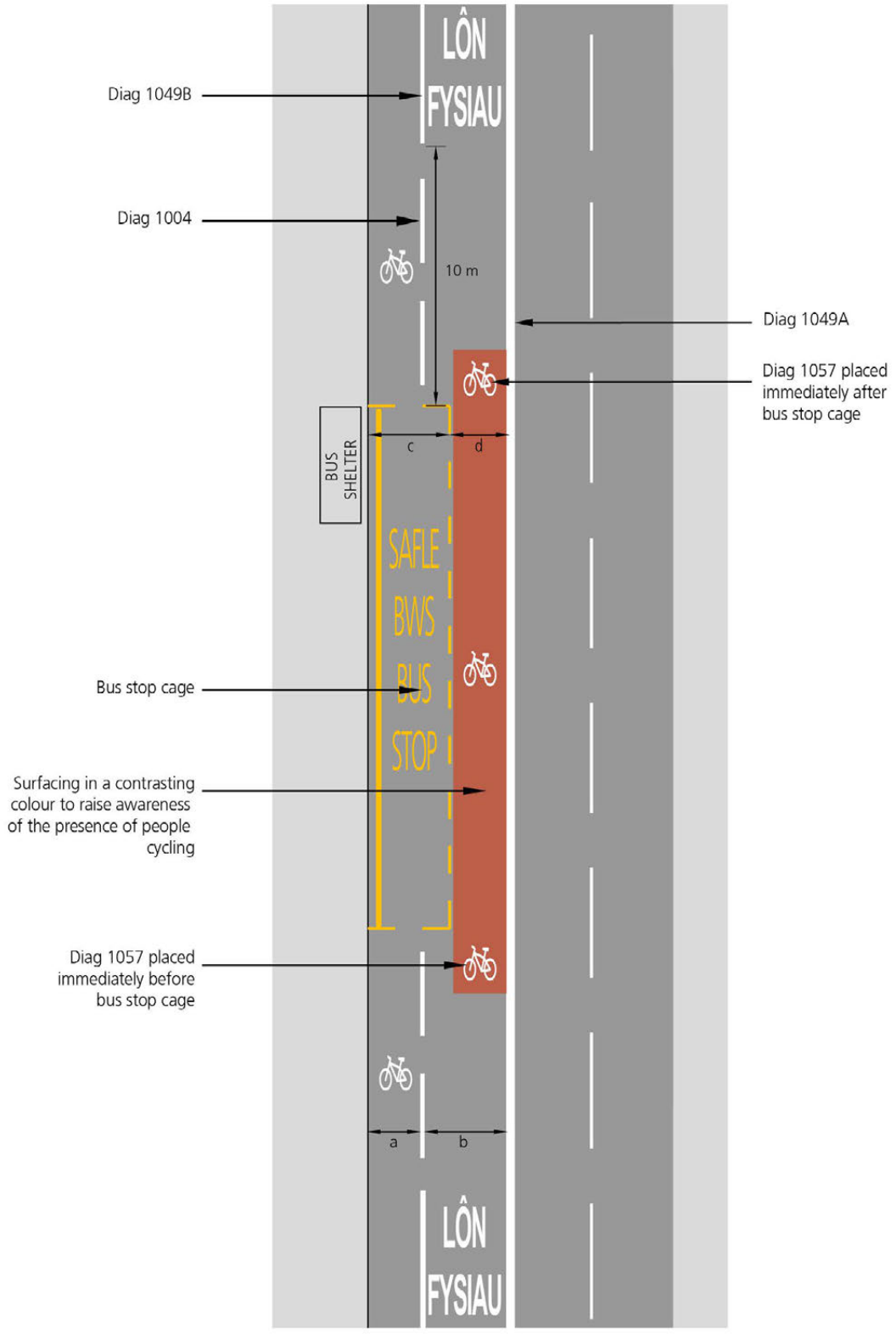
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Manual for Streets.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE501

Bus stop: cycle lane continuation

AADT:
<2500
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE501 | Previous DE number: DE501

Do Not Scale Drawing | Revision number: 4

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DE502 Bus stop bypass on one-way cycle track

Measure and brief description

The safest way for people to cycle on a bus route (especially when busy) is on a separated cycle track, often next to the footway. At the bus stop, passengers will board and alight buses from a kerbed island between the cycle track and the carriageway. This design element is suitable for all flows (see **table 11.4**) and it is the preferred design for bus stops in separated one-way cycle routes – see **figure 11.29** bus stop design selector.

The advice in this guidance represents current accepted approaches and best practice at the time of publishing. However, this detail will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK. Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text in **section 11.34**.

Benefits

- Bus users have a safe, separated space to board and alight the bus.
- Maintains continuous safe route for people cycling.
- Reduces the risk of collision between people cycling and buses.
- Reduces conflict between bus users, people walking and wheeling and people cycling.

Key design features

- Island with detectable kerb, dropped on the crossing points. Shelter in the island (when space permits).
- This design element can be used with different types of crossing (uncontrolled, zebra and signalised) and more than one crossing. The type, layout and number of crossings selected should reflect site specific conditions and desire lines, and particularly the number of people cycling and people using the bus. Where bus user and cycle track user numbers are both high (see table 11.4), a signalised crossing is recommended.
- The island can be extended to cater for a larger number of bus users or more than one bus stop. The size of the island should be designed considering the peak bus stop use.
- Top of the raised table in a contrasting colour to highlight the presence of people using the bus and people cycling. May also have a different texture.
- Square edges (subject to visibility) and planters to highlight the change in environment to people cycling, but with vegetation low enough to allow visibility.
- Merge points where people cycling can skip the bypass and cycle on the carriageway instead, having the option to rejoin the cycle track just after the bus stop.

Dimensions[29]

- a – Cycle track width: desirable minimum 2.0m, Absolute minimum 1.25m at the bus island area.
- b – Island width: ideal 3.5m, desirable minimum 2.5m, absolute minimum 1.5m.
- Sinusoidal transition: desirable 1:12.

Other considerations

- This design can be used for cycle lanes (DE301 and DE302), cycle lanes with light separation (DE308), stepped cycle tracks (DE311) and separated off-carriageway tracks (DE313) – see section 11.28. The type of cycle infrastructure should conform with the ATNM Link design selector.
- Sufficient widths should be provided on the footway and on the island to accommodate passengers waiting for and alighting from buses. This should also consider space for ramps to be deployed for wheelchair users to board/alight the bus and space for them to turn (refer to Inclusive Mobility).
- Street furniture (including shelters) should be placed considering the space required for wheelchairs to turn when leaving a deployed ramp. Only street furniture which is absolutely required should be placed in the islands. Enough space should be allowed from face of kerbs on both sides as a buffer from vehicles and cycles.
- All shelters placed in bus stops with cycle tracks should be see through to allow users to see and be seen before entering the cycle track.
- Sinusoidal humps are preferred to standard ramps.
- Suggested bypass entry/exit taper 1:10.
- Pedestrian crossing point(s) should be provided with dropped kerbs and tactiles. Outside of crossings, a level difference of minimum 50mm is recommended.
- Crossing visibility should be considered during the design, relative to the design speeds and corresponding stopping sight distances.
- Tactiles tail should align with the bus door and flag. Bus cage should be positioned in accordance.
- The bus stop should be obvious to people as they cycle, who will need to be able to adjust their behaviour and speed to reflect the additional risk of conflict.
- Hazard signs warning people cycling of the presence of pedestrians may be used.
- Areas should be kept clean and free from debris.
- More than one access/exit to the bus island is recommended (escape route).
- Adequate drainage should be provided using cycle friendly gullies to prevent ponding and icing.
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers is also recommended.

29 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Where boundary-to-boundary highway widths are limited, motor traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 7.2) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- A specific designer's risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.

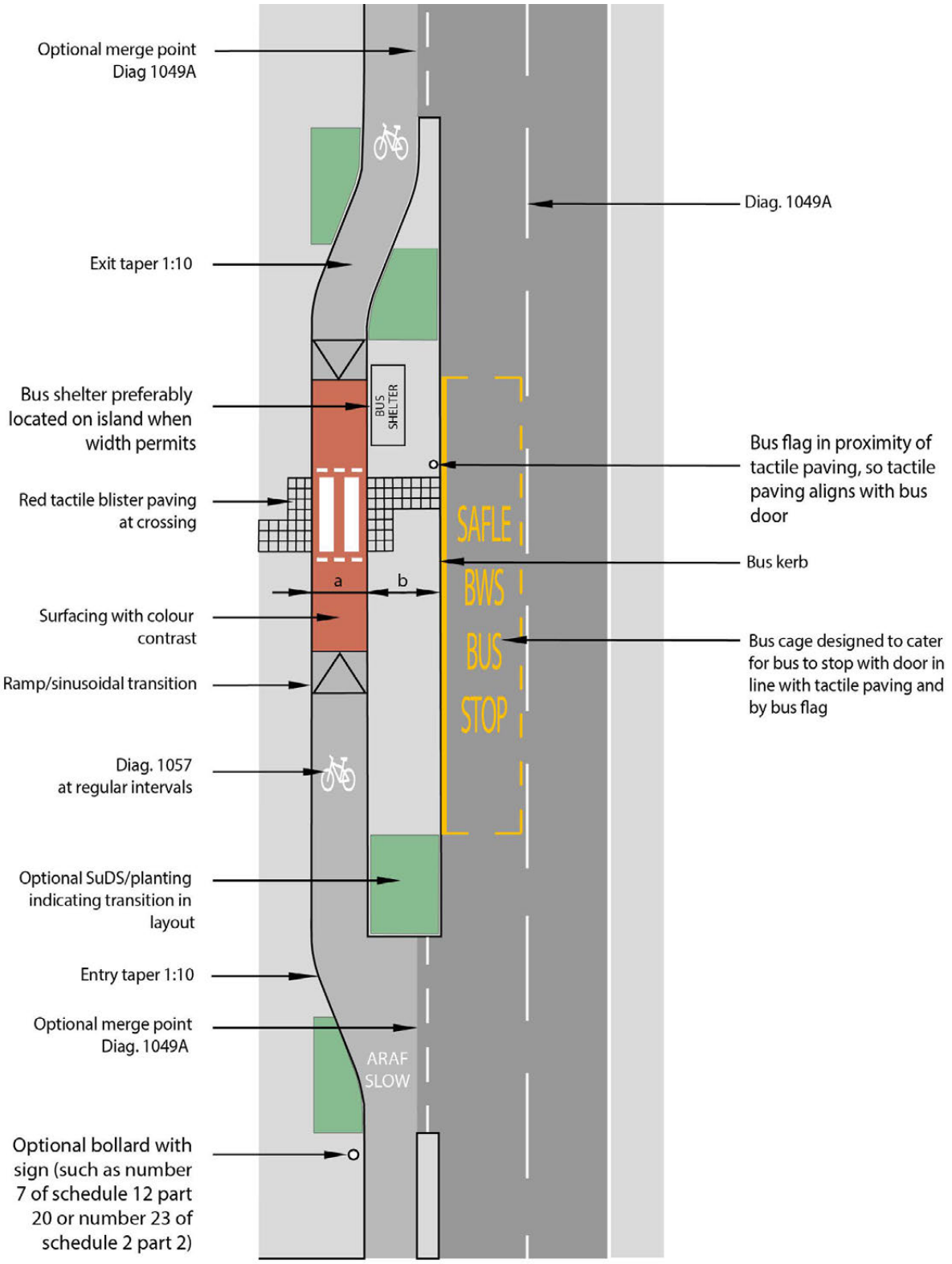
Further references

- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets 2.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Inclusive Mobility.
- Active Travel England – Floating bus stop provision and design.

DE502

Bus stop bypass on one-way cycle track

AADT:
Any
85th percentile speed:
Any



Llywodraeth Cymru
Welsh Government

DE number: DE502 | Previous DE number: DE502

Do Not Scale Drawing | Revision number: 4

Copyright: Welsh Government

DE503 Bus stop bypass on two-way cycle track

Measure and brief description

The safest way for people to cycle on a bus route (especially when busy) is on a separated cycle track, often next to the footway. At the bus stop, passengers will board and alight buses from a kerbed island between the cycle track and the carriageway. This design element is suitable for all flows (see table 11.4) and it is the preferred design for bus stops in separated two-way cycle routes – see figure 11.29 bus stop design selector.

The advice in this guidance represents current accepted approaches and best practice at the time of publishing. However, this detail will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.

Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text in section 11.34.

Benefits

- Bus users have a safe, separated space to board and alight the bus.
- Maintains continuous safe route for people cycling.
- Eliminates the risk of collision between people cycling and buses.
- Reduces conflict between bus users, people walking and wheeling and people cycling.

Key design features

- Island with detectable kerb, dropped on the crossing points. Shelter in the island (when space permits).
- This design element can be used with different types of crossing (uncontrolled, zebra and signalised) and more than one crossing. The type, layout and number of crossings selected should reflect site specific conditions and desire lines, and particularly the number of people cycling and people using the bus. Where bus user and cycle track user numbers are both high (see table 11.4), a signalised crossing is recommended.
- The island can be extended to cater for a larger number of bus users or more than one bus stop. The size of the island should be designed considering the peak bus stop use.
- Top of the raised table in a contrasting colour to highlight the presence of people using the bus and people cycling. May also have a different texture.
- Planters to highlight the change in environment to people cycling, but with vegetation low enough to allow visibility.

Dimensions[30]

- a – Cycle track width: desirable minimum 3.0m, Absolute minimum 2.5m for peak hour cycle flow <250 (see table 9.10).
- b – Island width: ideal 3.5m, desirable minimum 2.5m, absolute minimum 1.5m.
- Sinusoidal transition: desirable 1:12.

Other considerations

- This design can be used for cycle lanes with light separation (DE308), stepped cycle tracks (DE311) and separated off-carriageway tracks (DE313) – see section 11.28. The type of cycle infrastructure should conform with the ATNM Link design selector.
- Sufficient widths should be provided on the footway and on the island to accommodate passengers waiting for and alighting from buses. This should also consider space for ramps to be deployed for wheelchair users to board/alight the bus and space for them to turn (refer to Inclusive Mobility).
- Street furniture (including shelters) should be placed considering the space required for wheelchairs to turn when leaving a deployed ramp. Only street furniture which is absolutely required should be placed in the islands. Enough space should be allowed from face of kerbs on both sides as a buffer from vehicles and cycles.
- All shelters placed in bus stops with cycle tracks should be see through to allow users to see and be seen before entering the cycle track.
- Sinusoidal humps are preferred to standard ramps.
- Suggested bypass entry/exit taper 1:10.
- Pedestrian crossing point(s) should be provided with dropped kerbs and tactiles. Outside of crossings, a level difference of minimum 50mm is recommended.
- Crossing visibility should be considered during the design, relatively to the design speeds and corresponding stopping sight distances.
- Tactiles tail should align with the bus door and flag. Bus cage should be positioned in accordance.
- The bus stop should be apparent to people as they cycle, who will need to be able to adjust their behaviour and speed to reflect the additional risk of conflict.
- Hazard signs warning people cycling of the presence of pedestrians may be used.
- Areas should be kept clean and free from debris.
- More than one access/exit to the bus island is recommended (escape route).
- Adequate drainage should be provided using cycle friendly gullies to prevent ponding and icing.
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers is also recommended.

30 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Where boundary-to-boundary highway widths are limited, traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 7.2) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- A specific designer risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.

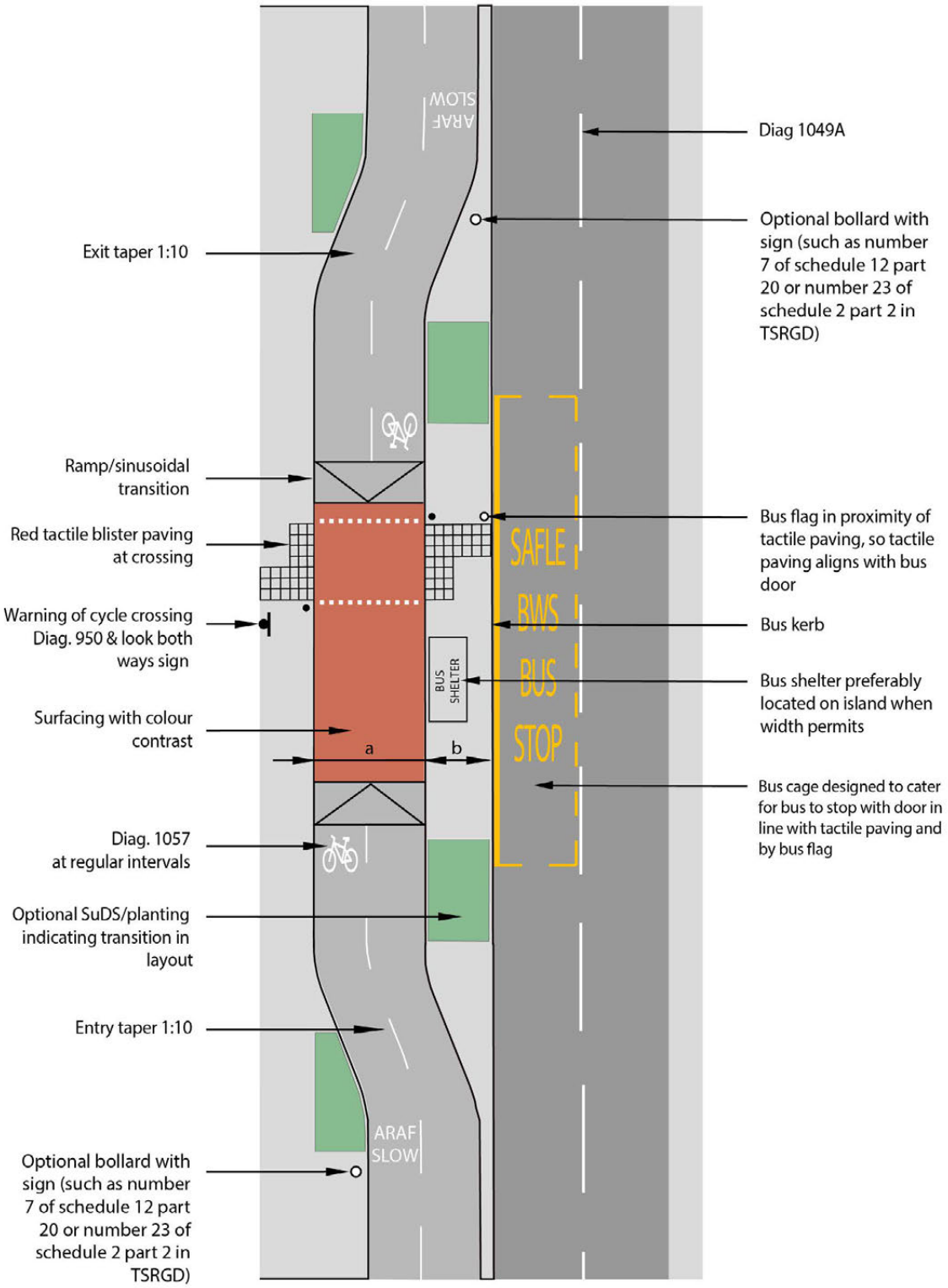
Further references

- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets 2.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Inclusive Mobility.
- Active Travel England – Floating bus stop provision and design.

DE503

Bus stop bypass on two-way cycle track

AADT:
Any
85th percentile speed:
<33mph



Llywodraeth Cymru
Welsh Government

DE number: DE503 | Previous DE number: N/A

Do Not Scale Drawing | Revision number: 1

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DE504 Cycle track with bus boarding island

Measure and brief description

The preferred bus stop design on a cycling route where motorised traffic speeds and volumes are too high for cycling in the carriageway is the bus stop bypass in **DE502** and **DE503**, which is suitable for all numbers of users. This option should only be considered when there is no space available for a bus bypass and it is not possible to make space for one (see **figure 11.29** bus stop design selector).

The boarding island, even though of a more reduced width, will allow bus passengers a space to board and alight the bus, separate from the cycle track. This detail is only suitable for low flow of users (see **table 11.4**).

The advice in this guidance represents current accepted approaches and best practice at the time of publishing.

However, this detail will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.

Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text in **section 11.34**.

Benefits

- Bus users have a space to board and alight the bus.
- Maintains continuous safe route for people cycling.
- Reduces the risk of collision between people cycling and buses.
- Reduces conflict between bus users, people walking and wheeling and people cycling.

Key design features

- Small island marked by a small trapezoidal demarcation kerb and flush at the crossing points.
- Top of the raised table in a contrasting colour to highlight the presence of people using the bus and people cycling. May also have a different texture.
- Shelter and bus flag on the footway, due to reduced space in island.
- Tramline tactile paving on the cycle track to avoid people walking down the cycle track.
- Merge points available where people cycling can skip the bus stop and cycle on the carriageway instead, having the option to rejoin the cycle track just after the bus stop.

Dimensions[31]

- a – Cycle track width: absolute minimum 1.25m.
- b – Island width: desirable minimum 1.5m, absolute minimum 1.0m.
- Sinusoidal transition: desirable 1:12.

Other considerations

- This design can be used for cycle lanes (DE301 and DE302), cycle lanes with light separation (DE308), stepped cycle tracks (DE311) and separated off-carriageway tracks (DE313) – see section 11.28. The type of cycle infrastructure should conform with the ATNM Link design selector, see figure 11.1.
- Sufficient space should be provided to accommodate passengers waiting for and alighting from buses. This should also consider space for ramps to be deployed for wheelchair users to board/alight the bus and space for them to turn (refer to Inclusive Mobility).
- Street furniture should be placed considering the space required for wheelchairs to turn when leaving a deployed ramp. No street furniture should be placed in the island.
- All shelters placed in bus stops with cycle tracks should be see through to allow users to see and be seen before entering the cycle track.
- Sinusoidal humps are preferred to standard ramps.
- Pedestrian crossing point(s) should be provided with flush kerbs and tactiles. Outside of crossings, a trapezoidal delineator strip should be used (or hazard tactile paving if proposing a flush kerb).
- Crossing visibility should be considered during the design, relative to the design speeds and corresponding stopping sight distances.
- Tactiles tail should align with the bus door and flag. Bus cage should be positioned in accordance.
- The bus stop should be obvious to people as they cycle, who will need to be able to adjust their behaviour and speed to reflect the additional risk of conflict.
- Hazard signs warning people cycling of the presence of pedestrians may be used.
- Areas should be kept clean and free from debris.
- Adequate drainage should be provided using cycle friendly gullies to prevent ponding and icing.
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers is also recommended.
- Where boundary-to-boundary highway widths are limited, traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 7.2) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- A specific designer risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.

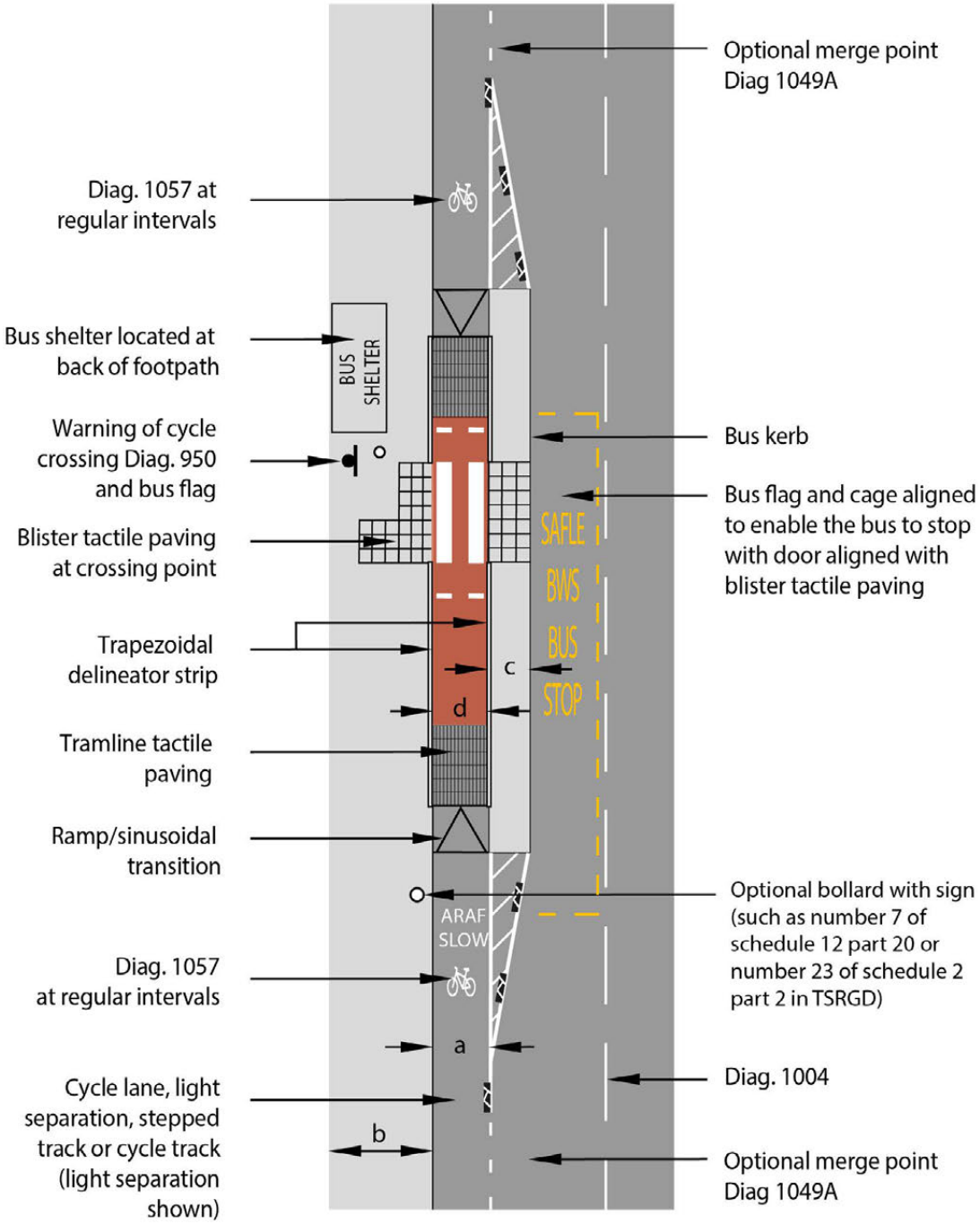
31 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Further references

- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets 2.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Inclusive Mobility.
- Active Travel England – Floating bus stop provision and design.

DE504 Cycle track with bus boarding island

AADT:
Any
85th percentile speed:
<33mph



Note:

The maximum 85th percentile speed recommended refers to the light separation on the detail. If a superior protection of the cycle track is proposed, the detail will be suitable for higher speeds (see table 11.1).

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DE505 Bus stop: bus boarder

Measure and brief description

The preferred bus stop design on a cycling route where motorised traffic speeds and volumes are too high for cycling in the carriageway, is the bus stop bypass in **DE502** and **DE503**, which is suitable for all numbers of users (**table 11.4**). This option should only be considered when there is no space available for a bus bypass or a boarding island (**DE504**) and it is not possible to make space for one (see **figure 11.29** bus stop design selector).

The bus boarder does not have a separate area for people to board and alight the bus, hence why it should only be used when nothing else can be fitted and in low flow areas with good visibility. This detail has a shared use area that bus users share with cyclists, demarcated by trapezoidal delineator strip on the footway side and tramline paving on cycle track sides.

The advice in this guidance represents current accepted approaches and best practice at the time of publishing.

However, this detail will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.

Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text in **section 11.34**.

Benefits

- Has a reduced shared use area, aimed to minimise the conflict area (opposed to shared use bus stop DE506).
- Reduces the risk of conflict between people cycling and buses, allowing a safe route for people who are less experienced cycling and making it suitable for areas with higher motor traffic speeds and flows.

Key design features

- Boarder has a small length to reduce conflict area.
- Boarder is raised and in a contrasting colour to highlight the presence of people using the bus and people cycling. May also have a different texture.
- Bus shelter, flags and street furniture are placed on the footway, allowing people walking and wheeling to move freely even when a ramp is deployed and do comfortable turning movements.
- Sufficient space should be provided at the bus stop to avoid waiting bus passengers standing in the shared use area.
- Merge points available where people cycling can skip the bus boarder and cycle on the carriageway instead, having the option to rejoin the cycle track just after the bus stop.

- Give way line to remind cyclists that they should give way to bus users.
- Sinusoidal transition: desirable 1:12.

Dimensions[32]

- a – Bus boarder width: absolute minimum 1.25m.
- b – Retained footway width: desirable minimum 3.0m, absolute minimum 2.0m.
- c – Crossing width, absolute minimum 1.2m.

Other considerations

- The trapezoidal delineator strip should be installed along the length of the footway.
- Shared use path transition, to mark the flush area. The delineator strip will be interrupted on the area in front of the bus door, where guidance paving should be installed (see Guidance on the Use of Tactile Paving Surfaces) to a minimum width of 1.2m, as this section should be flush.
- If the levels permit a crossfall that is not excessive (refer to section 9.7), the trapezoidal delineator strip may be replaced by a 50mm upstand kerb (that will be flush on the crossing point in front of the bus door).
- Tramline tactile paving should be installed to a depth of 2.4m at the cycle track/shared use area transitions.
- This arrangement should only be used as a last resort, where there is no space available or possible to be reallocated to make space for detail DE502, DE503 and DE504. Even when there is no space available, this detail should only be used for low flows (see table 11.4).
- Sufficient space should be provided for wheelchairs to turn when leaving a deployed ramp. No street furniture should be placed directly in line with where the bus door is expected to open.
- All shelters placed in bus stops with cycle tracks should be see through to allow users to see and be seen before entering the cycle track.
- Sinusoidal humps are preferred to standard ramps.
- This design should only be considered for one-way cycle infrastructure. It can be used for cycle lanes, light separation or one-way stepped cycle tracks.
- The bus stop should be apparent to people as they cycle, who will need to be able to adjust their behaviour and speed to reflect the additional risk of conflict.
- Hazard signs warning people cycling of the presence of pedestrians may be used.
- Good intervisibility is required between people walking and wheeling (those waiting for a bus as well as those passing) and those cycling, to minimise potential for user conflict.
- Tactile guidance paving should align with the bus door and flag. Bus cage should be positioned in accordance.
- Areas should be kept clean and free from debris.
- Adequate drainage should be provided using cycle friendly gullies to prevent ponding and icing.

32 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Where boundary-to-boundary highway widths are limited, traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 7.2) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers and drivers is also recommended.
- A specific designer risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.

Further references

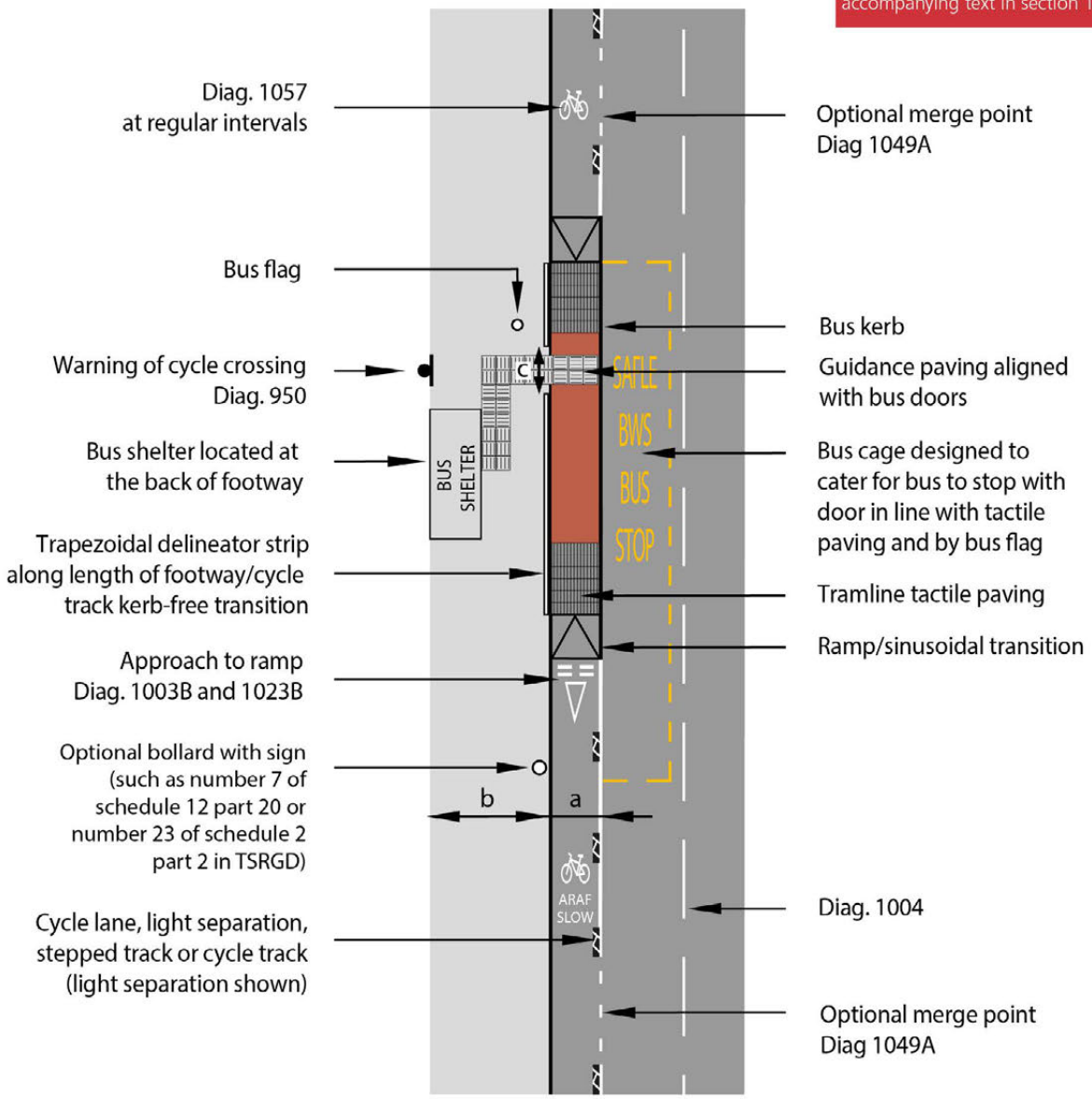
- Manual for Streets 2.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Inclusive Mobility.
- Active Travel England – Floating bus stop provision and design.

DE505

Bus stop: bus boarder

AADT:
Any
85th percentile speed:
<33mph

Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text in section 11.34.



Note:

The maximum 85th percentile speed recommended refers to the light separation on the detail. If a superior protection of the cycle track is proposed, the detail will be suitable for higher speeds (see table 11.1).

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DE506 Bus stop: shared use

Measure and brief description

Where traffic conditions require people cycling to be separated from motor vehicles and the numbers of active travel users are low, a shared use link may be acceptable (see **ATNM link selector** in **figure 11.1**). In these locations, where bus users are also low, a shared use bus stop may be used.

Local authorities should engage with relevant stakeholder groups during the planning and design process if this design example is being considered. Please refer to the accompanying text on shared use in **section 11.34**.

Benefits

- Reduces the risk of conflict between people cycling and buses, allowing a safe route for people who are less experienced cyclists and making it suitable for areas with higher motor traffic speeds and flows.

Key design features

- All area is shared use.
- Appropriate only when numbers of users are low (people walking and wheeling, people cycling and people using the bus stop).
- Should always provide clear space for passengers to wait where they will not come into conflict with people that are cycling.

Dimensions[33]

- a – Retained shared use path width between boundary and bus shelter and/or bus flag: desirable minimum 3.0m, absolute minimum 2.5m (see section 11.16).

Other considerations

- Sufficient space should be provided for wheelchairs to turn when leaving a deployed ramp. No street furniture should be placed directly in line with where the bus door is expected to open.
- Provision should be made for people to board and alight safely from the bus on an area of footway, which is not used by people cycling.
- Should always have good intervisibility between people walking and wheeling (those waiting for a bus as well as those passing) and those cycling, to minimise potential for user conflict.
- The bus stop should be apparent to people as they cycle, who will need to be able to adjust their behaviour and speed to reflect the additional risk of conflict.

33 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Signs and hazard/corduroy tactile paving on each side of the bus stop, highlighting that the area is shared use are recommended.
- All shelters placed in bus stops with cycle tracks should be see through to allow users to see and be seen before entering the cycle track.
- Potential for conflict between people cycling and people that are walking and wheeling in the shared use area (please see section 11.31).
- Where boundary-to-boundary highway widths are limited, traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be consulted with from the early stages of design. Engagement with bus providers and drivers is also recommended.
- Careful assessment is essential before introducing a shared use path. Please refer to ATNM link selector in figure 11.1 to confirm this is the appropriate type of infrastructure.
- A specific designer risk assessment should be carried out for bus stops on cycle routes, considering the interactions between buses, bus users, people walking and wheeling on the footway and people cycling.
- This detail may only be considered in conjunction with a separated walking and wheeling/cycling infrastructure in exceptional circumstances, having demonstrated that all other options were explored and not achievable, and where numbers of users are low enough for shared use to be acceptable (see table 11.3). In these circumstances, ladder and tramline tactile paving should be installed at least 15m from the waiting area, as per Guidance on the Use of Tactile Paving Surfaces.

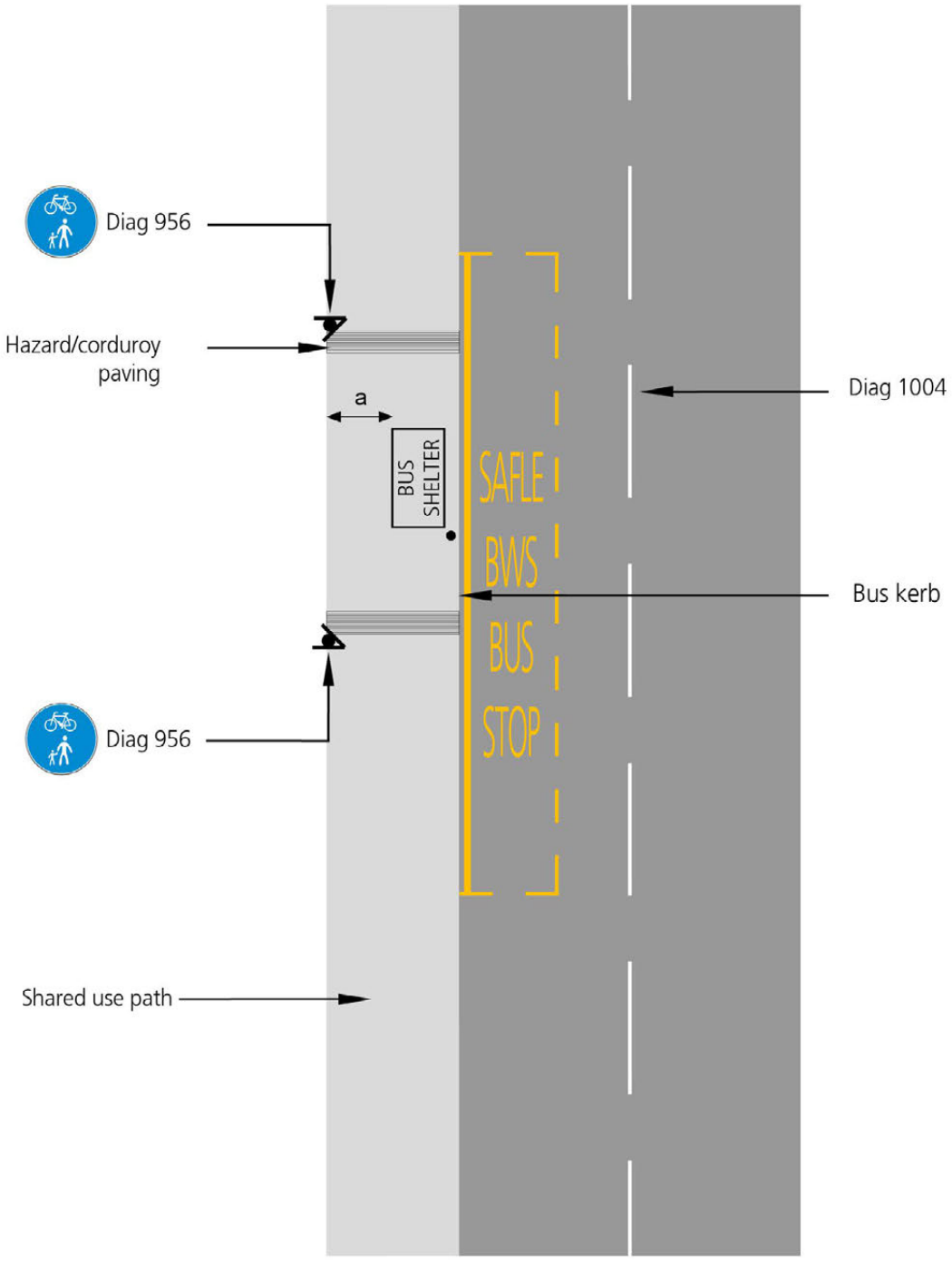
Further references

- Manual for Streets 2.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- TSRGD.
- Department for Transport – Inclusive Mobility.

DE506

Bus stop: shared use

AADT:
Any
85th percentile speed:
Any



Llywodraeth Cymru
Welsh Government

DE number: DE506 | Previous DE number: DE504

Do Not Scale Drawing | Revision number: 4

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DE507 Bus lane

Measure and brief description

The primary purpose of bus lanes is to improve the reliability of bus services by giving priority to buses over other vehicles on congested parts of the road network. Combined bus and cycle lanes can also be a useful feature for people that are cycling, enabling them to share in the congestion avoidance and time-saving benefits provided to buses, as well as providing safer conditions for cycling. The default position is to allow cycles to use bus lanes.

Bus lanes should not be regarded as part of designated Active Travel Networks unless bus flows are light and/or there is a cycle lane within the bus lane, and no other vehicles (such as taxis or motorcycles) are allowed.

Benefits

- Gives people cycling priority over general traffic at the locations and times where it is most needed.
- People on cycles using bus lanes have less traffic to interact with than if using a general traffic lane.
- There is a space buffer between the general traffic lane and the people cycling, (albeit occupied intermittently by buses).
- Cycle lanes within bus lanes are safer and more comfortable than shared bus lanes or general cycle lanes, since people cycling are passed by fewer vehicles.

Key design features

- Where bus lanes are proposed and are expected to form the main provision for cycling along a route, a cycle lane or track should be provided along the bus lane.
- The cycle lane would preferably be a mandatory lane, although authorities could use an advisory lane. This will also simplify TRO requirements.
- The hours of operation of bus lanes where cycles are permitted should normally be ‘at all times’ to provide the highest benefit for people that wish to cycle. Where mandatory cycle lanes operate within bus lanes, they may operate full time even if the bus lane is part time.
- Diagram 1048 (‘Bus Lane’) markings must always be used in with-flow situations. The use of diagram 1048.1 (‘Bus and Cycle Lane’) is reserved for contra-flow facilities only unless specially authorised.

Dimensions[34]

- a – 4.0m wide bus lane with no cycle lane is the recommended minimum width where bus speeds and volumes are low. If widths of 4.0m on lower flow routes are not possible, then the bus lane should be restricted in width to 3.2m. This removes the dilemma for bus drivers of

34 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

whether there is sufficient width to overtake a person cycling within the confines of the bus lane. Cycles are still allowed to use the Bus Lane, but buses will have to drive into the general traffic lane when overtaking people that are cycling. Bus lane widths of between 3.2m and 3.9m should not be provided as they leave insufficient room for buses to overtake people cycling safely and comfortably. Where off-peak car 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 people cycling to pass stationary motor vehicles without leaving the bus lane. It is also preferable to mark parking bays within bus lanes to encourage drivers to park close to the kerb.

- b – Cycle lanes within bus lanes: desirable minimum 2.0m, absolute minimum 1.5m when peak hour cycle flow <250 (see table 9.10).
- c – Minimum width for the bus lane outside of the cycle lane: desirable minimum 3.0m.

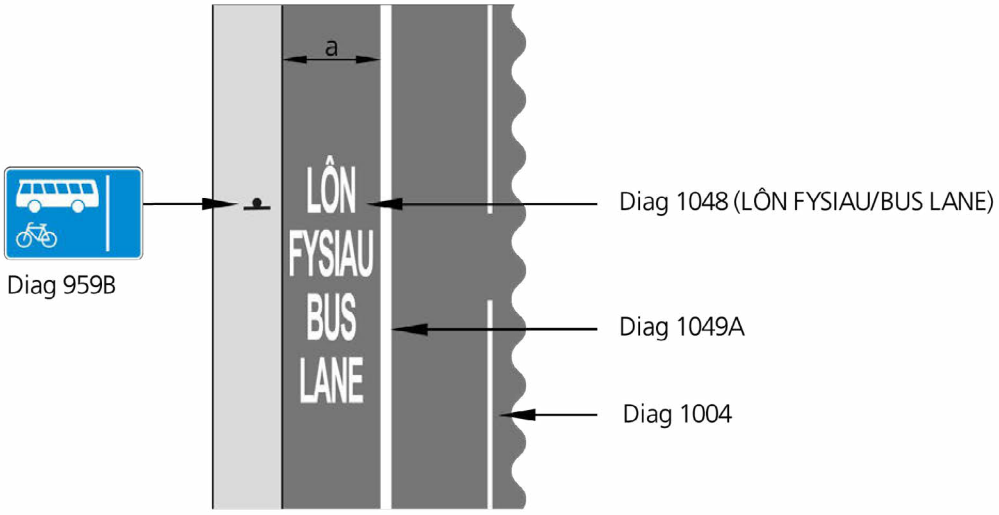
Other considerations

- Some people (for example, people who have less experience cycling or carers with children) might feel unsafe and/or uncomfortable cycling in bus lanes. This arrangement can therefore exclude a large number of potential users.
- Where bus lanes are provided, care should be taken to ensure that provision for people cycling in the opposite direction is not compromised.
- There is often pressure on highway authorities to permit a wide range of other users to use bus lanes, including taxis, private hire vehicles and motorcycles. This can reduce the benefits afforded to cycling and should be avoided.
- There should be a presumption in favour of designing contraflow bus lanes to be of sufficient width to accommodate cycles. Where this is the case the widths referred to above for with-flow bus lanes will apply.
- Where bus-only links are provided, for example between two residential neighbourhoods, the design should normally include provision for cycling.
- Where boundary-to-boundary highway widths are limited, traffic lanes should be the first to be reduced to absolute minimums (see Manual for Streets 2, section 8.6.4) to allow desirable minimums to be provided for people walking, wheeling and cycling as per sustainable transport hierarchy (see figure 3.3). Subsequent reductions towards absolute minimum widths in walking, wheeling and cycling provision should consider local accessibility requirements, place characteristics and local wheeling, walking and cycling movement requirements (in that order of priority).
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

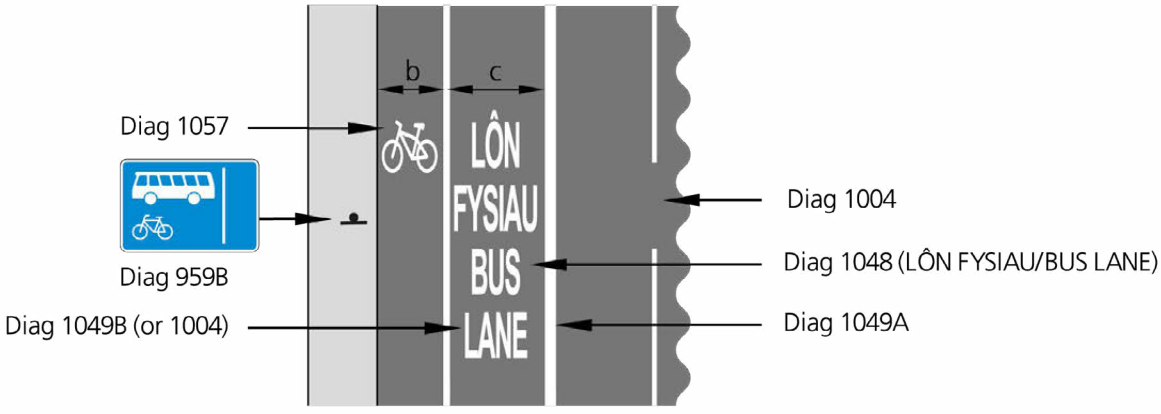
Further references

- Department for Transport (2018) – Traffic Signs Manual, Chapter 3.
- Manual for Streets 2.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE507	Bus lane	AADT: <5000 85th percentile speed: <22mph



Bus lane shared with cyclists



Cycle lane within bus lane (preferred)

Llywodraeth Cymru Welsh Government	DE number: DE507	Previous DE number: DE505
	Do Not Scale Drawing	Revision number: 3
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DE601 Unmarked informal junction

Measure and brief description

Junctions in urban areas, even on relatively busy routes, can be designed without defined priority, requiring all road users to slow down and engage/negotiate with other road users. The application of these 'shared space' principles is common and has been demonstrated to be effective in terms of traffic capacity and safety on four-arm junctions where motor traffic flows are less than 2,000 AADT. Examples include junctions in the centre of Cardiff, Wrexham, Kidderminster, Pontypridd (see photos). This type of junction can work well for people walking, wheeling and cycling (see **section 12.5**).

Benefits

- Reduced delays to all users, particularly during off-peak periods.
- Improved public realm, enhancing the attractiveness of urban centres.

Key design features

- Junctions of this type should be designed to suit local circumstances – standardised solutions are not appropriate.
- Motor vehicle paths should be limited to a single lane on entries and exits.
- General lane widths should be kept as narrow as possible but separate provision may be made for people cycling so that they are able to pass queuing vehicles on the junction approaches.
- Measured 85th percentile speeds on the approaches should be lower than 22mph.
- Traffic signal crossings should not be used on the approaches to the junction since green signals can reinforce peoples' driving sense of priority over people walking and wheeling.
- Informal (or zebra/parallel pedestrian and cycle crossings) should be provided on desire lines.
- Crossings can also be made available to people cycling so that they can travel around the junction via cycle tracks or shared paths outside the carriageway.
- Crossings should be paved in a material which contrasts with the general carriageway, with tactile paving.
- Central islands or median strips at crossings help people walking, wheeling and cycling to cross and make it more likely that people driving will cede priority (see DE207 and DE608).
- Paving materials that are visibly different from standard bituminous surfacing will help to reinforce the distinctiveness of the place.
- A range of kerb heights can be used between crossing points. Flush or very low kerbs will require tactile paving (see Guidance on the Use of Tactile Paving Surfaces).

Other considerations

- This type of junction works best in urban areas with high numbers of people walking and wheeling and general activity, particularly town and city centres.
- They can form part of a wider public realm/shared space scheme, but can also be provided in isolation.
- Blind and partially sighted users and representatives should be consulted as part of any changes to the highway layout as described above.

Further references

- Department for Transport – Guidance in the use of tactile paving surfaces.
- Manual for Streets.

DE601	Unmarked informal junction	**AADT:** <2000 **85th percentile speed:** <22mph



St Mary Street, Cardiff.
Unmarked priority. Flush kerb marked with hazard tactile paving which is replaced by blister tactile paving to create designated crossing points.



High Street, Wrexham.
Shared area marked with hazard tactile paving.



Exchange Square, Kidderminster.
Blended crossing (with tactiles) on approach to a junction/public square with no designated priorities.



Taff Street, Pontypridd.
Design encouraging circulatory priority, however not defined.
No designated crossings.

DE602 Shared or separated pedestrian and cycle track at side road with priority

Measure and brief description

Uncontrolled shared or separated crossings at side roads should give priority to users proceeding along the major road wherever safe and practicable. Priority crossings will avoid loss of momentum and present a strong promotional message about how active travel is valued along a corridor. Factors to be considered when determining who has priority include: location, motor vehicle speed and volume, visibility, number of pedestrian and cycle movements and collision records (see **section 12.5**).

Benefits

- Improved continuity and reduced effort for people cycling.
- Raised status for people walking, wheeling and cycling.
- Reduced vehicle speeds on side roads entering junction.

Key design features

- Side roads and accesses where 85th percentile vehicle speeds are less than 22mph and volume is less than 2,000 vehicles per day will normally be suitable for pedestrian and cycle priority crossings.
- When cycle tracks are two way, people driving waiting to turn right into a side road may not anticipate cycles approaching from behind. Similarly, people driving from the side road may not anticipate cycles approaching from the left. One way cycle tracks which operate in the same direction as general traffic are therefore preferred for this design.
- Priority crossings should be located on a raised table, preferably with the use of entrance kerbs.
- Raised tables slow down speeds, encouraging people driving to have more attention and giving priority to people walking and wheeling.
- The speed reduction effect of raised tables can be used to mitigate reduced visibility at some low volume/low speed junctions.
- The raised table must comply with the Highways (Road Humps) Regulations.
- The raised table should extend from kerb to kerb to benefit people walking and wheeling who are crossing the junction. This will require attention to drainage requirements to avoid standing water at the ramps.
- The corner radii and carriageway width of the side road should be minimised (see section 12.2).
- Cycle track should not turn through more than 45 degrees on approaches.
- There needs to be good levels of inter-visibility between people walking, wheeling, cycling and driving (see table 9.2 and section 9.14).

Dimensions[35]

- Corner radii – Desirable maximum 3.0m, Absolute maximum 6.0m.
- Table height should normally be 75mm, and no more than 100mm.
- Priority crossings are often 'bent out', (set back 5m from the junction channel line) to enable a vehicle to stop clear of the main carriageway. However, there are a number of schemes where the crossing has been built closer to the junction which have operated satisfactorily (see section 12.5).

Other considerations

- Consider highlighting the crossing with coloured surfacing.
- Cycle track crossings can be difficult places for younger people or those with less experience of cycling to negotiate, as they need to ensure that they are aware of vehicles on both the main carriageway and the side roads and judge speeds and turning movements. Simple design and clear signing is therefore important. Early engagement with local cycling groups and youth groups will have a positive impact on the scheme (see chapter 5).
- The blister tactile paving should cover the whole length of flush kerb. Outside of the kerb crossing points, kerb should transition to a height difference of no less than 50mm to be cane detectable by visually impaired users. Corduroy/hazard tactile paving should be used in sections where there is a lack of a kerb upstand (but blister paving should still be used at crossing points).
- Early engagement with groups representing people with sight loss and other disabilities is essential, particularly where new or uncontrolled crossings are proposed (see chapter 5 and guidance in the use of tactile paving surfaces).

Further References

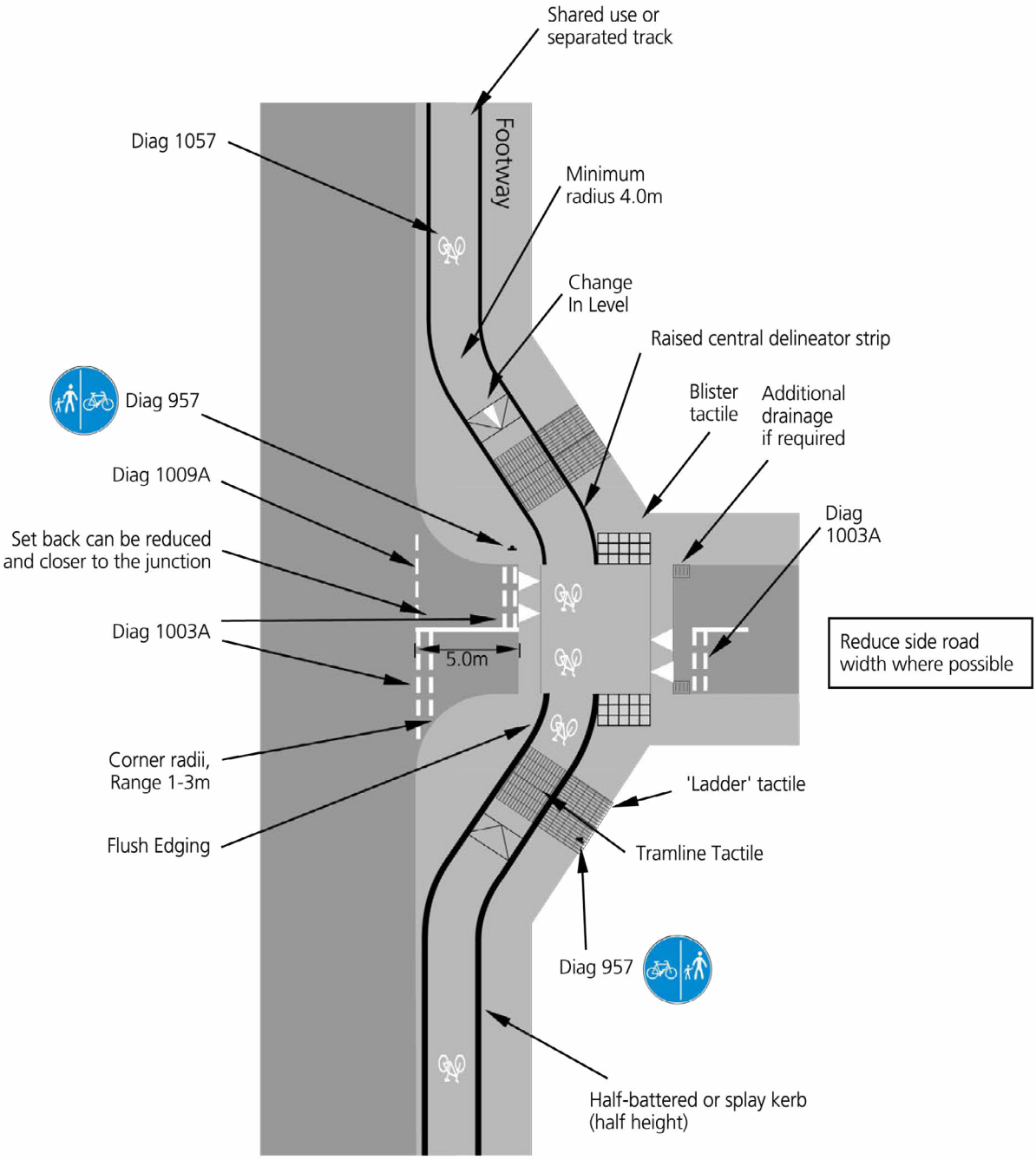
- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Manual for Streets.

35 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE602

Shared or separated pedestrian and cycle track at side road with priority

AADT:
<2000
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE602 | Previous DE number: DE602

Do Not Scale Drawing | Revision number: 4

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DE603 Shared or separated pedestrian and cycle track at side road give way

Measure and brief description

Priority crossings (DE602) might not be appropriate in all locations, and where people walking, wheeling and cycling are expected to give way at a side road, clear road markings will be necessary, together with measures to reduce the speed of vehicles using the junction. Factors to be considered when determining who has priority include: location, motor vehicle speed and volume, visibility, number of pedestrian and cycle movements and collision records (see section 12.5).

Benefits

- Less land required than 'bent out' priority crossings (DE602).
- Retains line of cycle track.

Key design features

- When cycle tracks are two way, people driving waiting to turn right into a side road may not anticipate cycles approaching from behind. Similarly people driving from the side road may not anticipate cycles approaching from the left. One way cycle tracks which operate in the same direction as general traffic are therefore preferred for this arrangement.
- The corner radii and carriageway width of the side road should be minimised.
- Cycle track should not turn through more than 45 degrees on approaches.
- Raised tables slow down speeds, encouraging people driving to have more attention and giving priority to people walking and wheeling.
- The speed reduction effect of raised tables can be used to mitigate reduced visibility at some low volume/low speed junctions.
- The raised table must comply with the Highways (Road Humps) Regulations.
- The raised table should extend from kerb to kerb to benefit people walking and wheeling who are crossing the junction. This will require attention to drainage requirements to avoid standing water at the ramps.

Dimensions[36]

- Corner radii – Desirable maximum 3.0m, Absolute maximum 6.0m.
- Table height should normally be 75mm, and no more than 100mm.

36 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- People cycling have to look through a wide angle to see approaching vehicles.
- Consider highlighting the crossing area with coloured surfacing.
- Cycle track crossings can be difficult places for younger people or those with less experience of cycling to negotiate, as they need to ensure that they are aware of vehicles on both the main carriageway and the side roads and judge speeds and turning movements. Simple design and clear signing is therefore important.
- The blister tactile paving should cover the whole length of flush kerb. Outside of the kerb crossing points, kerb should transition to a height difference of no less than 50mm to be cane detectable by visually impaired users. Corduroy/hazard tactile paving should be used in sections where there is a lack of a kerb upstand (but blister paving should still be used at crossing points).
- Early engagement with groups representing people with sight loss and other disabilities is essential, particularly where new or uncontrolled crossings are proposed (see chapter 5 and guidance in the use of tactile paving surfaces). It is important to consider inter-visibility in between users (see table 9.2 and section 9.14).

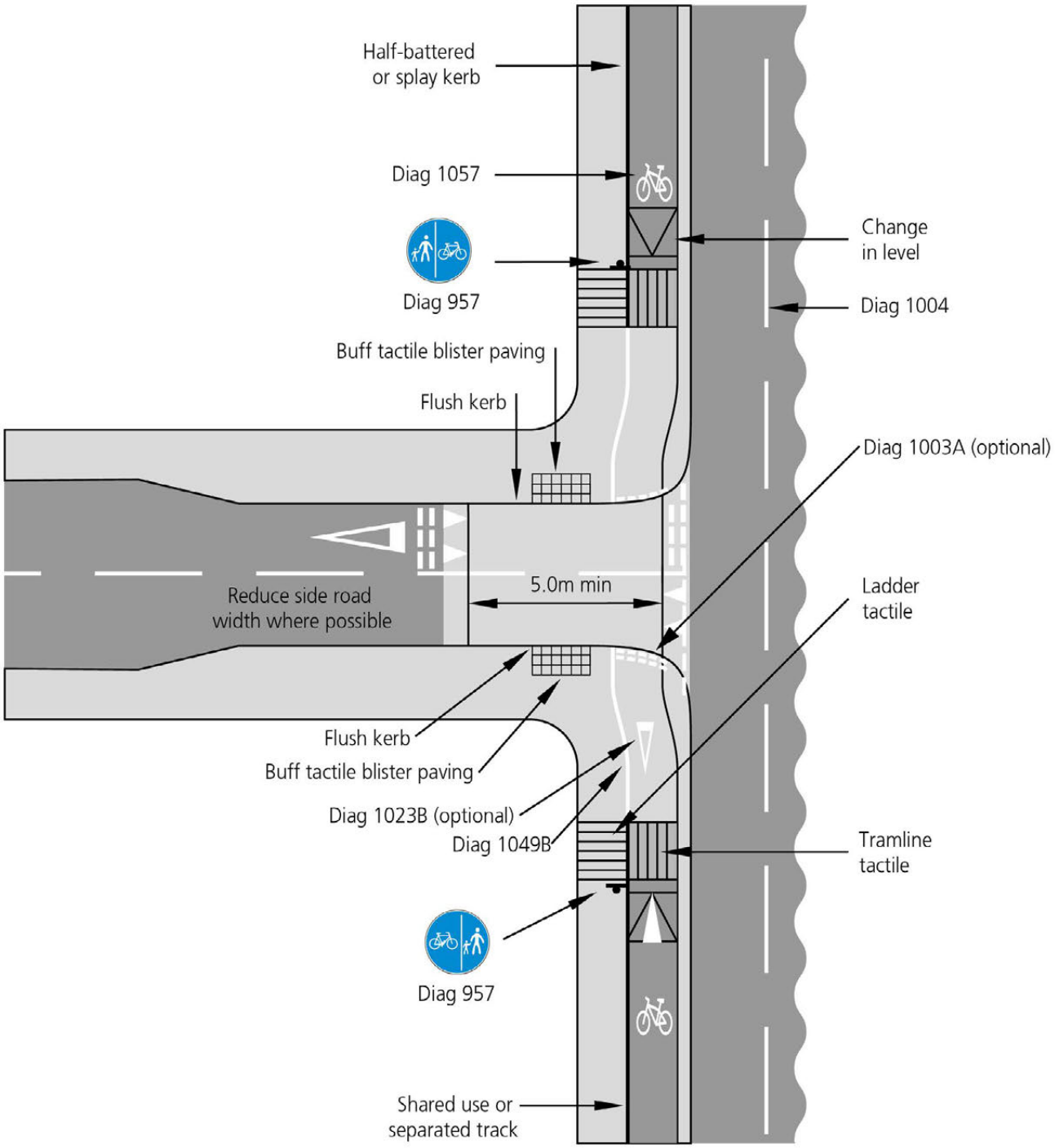
Further references

- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Manual for Streets.

DE603

Shared or separated pedestrian and cycle track at side road give way

AADT:
<2000
85th percentile speed:
<22mph



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Welsh Government

DE number: DE603 | Previous DE number: DE603

Do Not Scale Drawing | Revision number: 4

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DE604 Side road entry treatment

Measure and brief description

Pedestrian crossings will often be provided across minor roads at side road junctions, in the form of dropped kerbs. Side road entry treatments involve raising and narrowing the mouth of the junction to make it easier and safer for people walking and wheeling to cross the minor arm by reducing the speeds of turning vehicles, shortening the length of the crossing and providing a level route. The side road entry treatment also encourages people driving to give way to people walking and wheeling who have started to cross, in line with the **highway code** (see section 12.5).

Benefits

- Side road entry treatments make it easier and more convenient for people walking and wheeling to cross the side road.
- They also provide safety benefits to people cycling, helping to prevent collisions with motor vehicles turning into and out of the side road.

Key design features

- Raising the carriageway across the mouth of the side road will allow crossing in the desired lines and slow down speeds, encouraging people driving to have more attention and giving priority to people walking and wheeling.
- The speed reduction effect of raised tables can be used to mitigate reduced visibility at some low volume/low speed junctions.
- The raised table must comply with the Highways (Road Humps) Regulations.
- The raised table should extend from kerb to kerb to benefit people walking and wheeling who are crossing the junction. This will require attention to drainage requirements to avoid standing water at the ramps.
- Narrowing the side road to shorten the crossing distance, reduce traffic speeds and improve visibility (see table 9.2 and section 9.14).
- Tightening the corner radii of side road junctions to slow down turning vehicles and enable the crossing point to be closer to the desire line with improved visibility.
- Tactile paving to be provided at the crossing points (see guidance on the use of tactile paving surfaces).

Dimensions[37]

- a – Corner radii – Desirable maximum 3.0m, Absolute maximum 6.0m.
- Table height should normally be 75mm, and no more than 100mm.

37 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

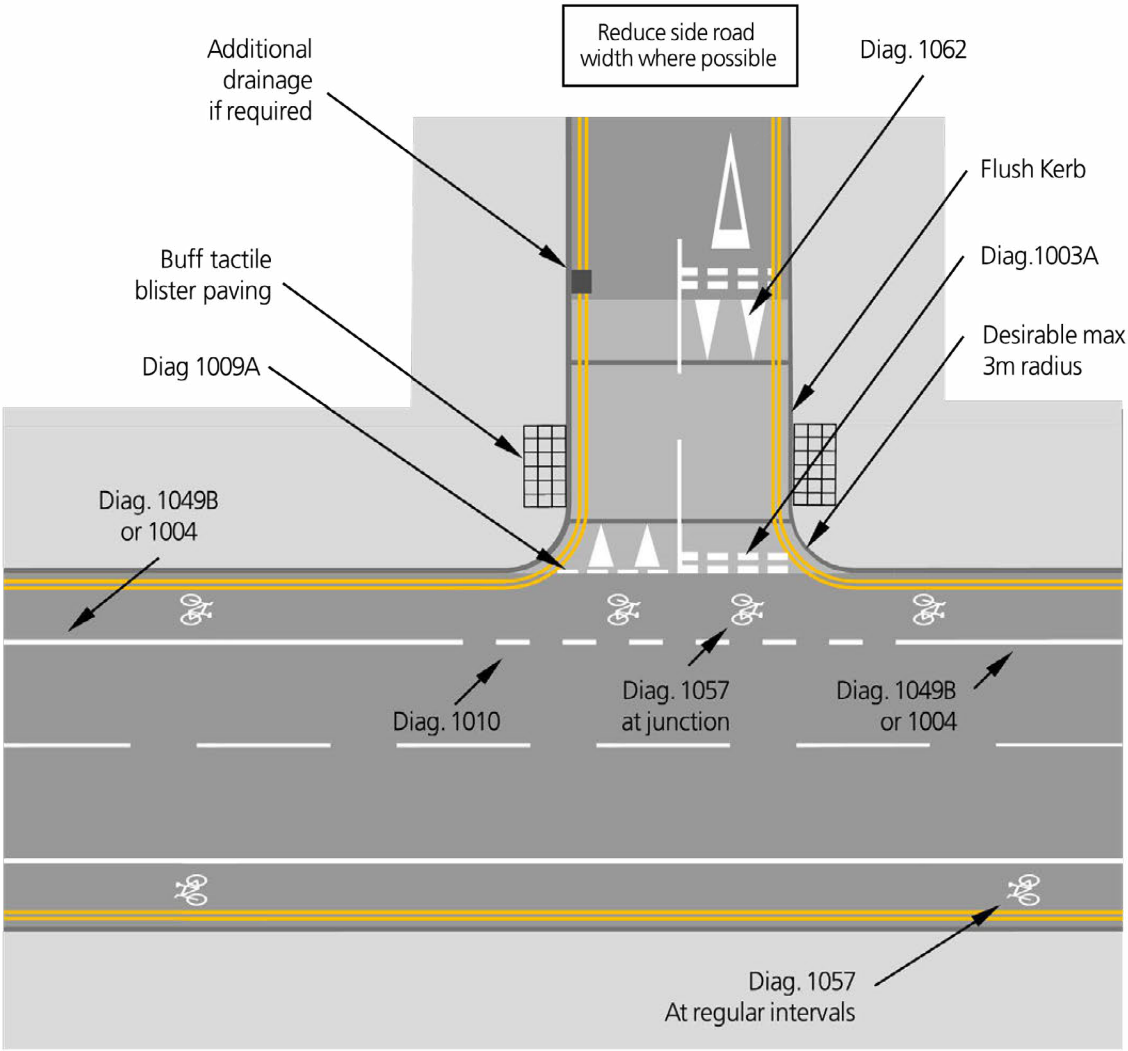
Other considerations

- Raised tables are a form of traffic calming and as such cannot be used on roads with a speed limit of 40mph or more.
- The gradient of the ramp should be considered so as not to create a hazard for motorcycles, people cycling turning into the side road and bus passengers (on bus routes).
- Corner radii will depend the swept path requirements of vehicles turning into or out of the side road (allowing for vehicles to cross centrelines unless flows are high) (see section 12.2).
- Tight corner radii will enable pedestrian crossing points to be provided on the desire line.
- Bollards may be provided to prevent over-run on corners.
- Strengthened corners may be necessary if over-run is to be expected.
- Care should be taken to ensure adequate drainage provision to prevent ponding of water at the bottom of the ramps with a raised table, or in the corners of build outs.
- The blister tactile paving should cover the whole length of flush kerb. Outside of the kerb crossing points, kerb should transition to a height difference of no less than 50mm to be cane detectable by visually impaired users. Corduroy/hazard tactile paving should be used in sections where there is a lack of a kerb upstand (but blister paving should still be used at crossing points).
- Early engagement with groups representing people with sight loss and other disabilities is essential, particularly where new or uncontrolled crossings are proposed (see chapter 5 and guidance in the use of tactile paving surfaces). A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.

Further references

- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Manual for Streets.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.

DE604	Side road entry treatment	**AADT:** <2000 **85th percentile speed:** <33mph



Llywodraeth Cymru Welsh Government	DE number: DE604	Previous DE number: DE604
	Do Not Scale Drawing	Revision number: 3
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DE605 Blended side road entry treatment

Measure and brief description

Where walking and wheeling flows are high relative to vehicle turning movements, the mouth of the side road junction should be narrowed and the radii reduced, and the carriageway level may be raised on a flat plateau. This makes it easier and safer for people to cross (particularly those with restricted mobility) by eliminating the height difference to the carriageway and slowing vehicles. The most important feature of this detail involves continuing the footway surface across the side road to strongly indicate to drivers that they should give way to people at the crossing. This detail is recommended where vehicle speeds and flows are low (see **table 12.1**), but the number of people walking, wheeling and cycling is high (see **section 12.5** and **table 12.1**).

The advice in this guidance represents current accepted approaches and best practice at the date of publication. However, this detail will be reviewed and updated periodically to account for emerging best practice following engagement between Welsh Government, Transport for Wales and relevant partners across the UK.

Benefits

- Blended side road entry treatments, by constraining the running path of motorised vehicles, make it safer and more convenient for people to cross the side road.
- They also provide a safety benefit to people cycling by helping to prevent collisions with motor vehicles turning in and out of the side road.
- As they slow down vehicles by design, they encourage people driving and cycling on the carriageway to comply with rule H2 from the Highway Code and give way to pedestrians crossing the side road.

Key design features

- Adequate for AADT lower than 2000 and 85th percentile speeds lower than 22mph, where flows of people walking and wheeling (and cycling in the first detail) are high.
- Inclusion of entrance kerbs to slow vehicles and visually and tactilely delineate the edge of the crossing from the rest of the carriageway.
- Raising the carriageway to footway level across the mouth of the side road.
- Narrowing the side road to shorten the crossing distance, reduce traffic speeds and improve visibility (see table 9.2 and section 9.14).
- Tightening the corner radii of side road junctions which will slow down turning vehicles and enable the crossing point to be closer to the desire line. Design should slow down the motor vehicles speed to a similar speed of people walking.

- The top of the raised table should be constructed in material suitable for a regular vehicle load which contrasts with the carriageway to indicate to drivers that they should treat it differently. The surface should be in a similar or identical material to the footway on either side.
- Blister tactile paving should be provided in accordance with the layout and appearance as detailed in the guidance for the use of tactile paving surfaces for an uncontrolled crossing that sits in the direct line of travel.

Dimensions[38]

- a – Corner radii – Desirable maximum 3.0m.
- b – Width of crossing – Minimum 3.0m, maximum recommended 6.0m. Plateau can be longer when integrated with other infrastructure (such as green blue infrastructure, or placemaking features).
- c – Ramps slope desirable maximum 1:10.
- Table height should normally be 75mm, and no more than 100mm.

Other considerations

- Ramp height to comply with The Highways (Road Humps) Regulations, the highest point of the crossing must be no more than 100mm from the existing carriageway level. Where a standard 125mm kerb upstand exists, the surrounding footway should be lowered, unless the surrounding carriageway area is raised to match instead.
- The gradient of the ramp should be considered maintaining a balance between not creating a hazard for people using motorbikes and cycles turning into the side road but also acting as a speed reduction feature.
- Corner radii should be as small as possible, subject to swept path requirements of vehicles turning into or out of the side road (allowing for vehicles to cross centre lines). If a large corner radii is required, then options for the junction treatment should be re-evaluated, as this arrangement might not be suitable.
- This detail should not be used in bus routes or routes with high number of HGVs.
- Bollards should be provided to prevent over-run on corners and help reducing speeds.
- Strengthened corners may be necessary if over-run is to be expected, but design should aim to avoid this.
- Parking and loading restrictions are recommended to ensure visibility between people driving and people walking, wheeling and cycling.
- Care should be taken to ensure adequate drainage provision to prevent ponding of water at the bottom of the ramps with a raised table, or in the corners of build outs.
- Tactile paving should be provided where the boundary between pedestrian only area and the space where motorised vehicles are expected is flush. Setting back the tactile paving from motorised vehicle path (circa 200-400mm) is recommended to act as a safety buffer, as the guide dogs tend to stop at the end of the tactile paving.

38 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- When infrastructure based on this detail is proposed, communities and key stakeholders, particularly those representing disabled users, should be engaged and consulted with from the early stages of design.
- This type of arrangement can be used with any type of cycle lane or track, including stepped, fully kerbed and lightly segregated, one-way or two-way.

Further references

- Department for Transport – Local Transport Note 01/07. Traffic Calming.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Manual for Streets.
- Highway Code.

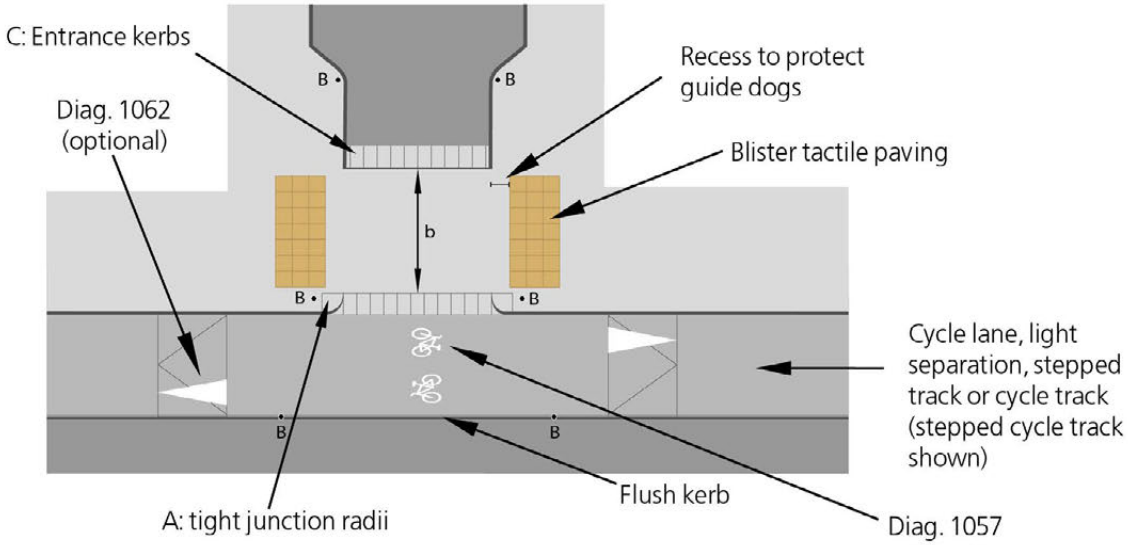
DE605

Blended side road entry treatment

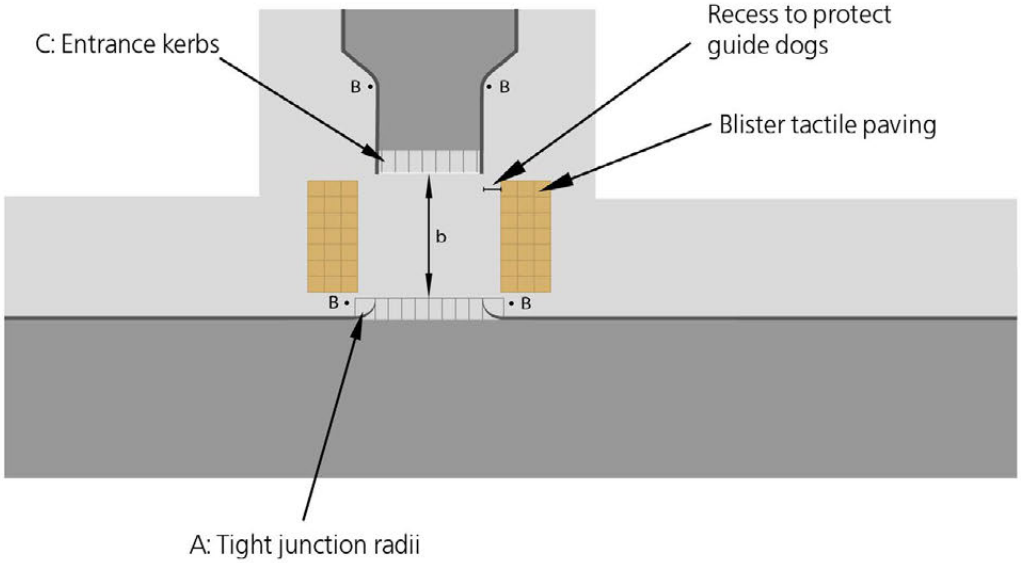
AADT:
<2000
85th percentile speed:
<22mph

B - Bollard/wand

Layout 1: Two-way side road entry



Layout 2: Priority/one-way side road entry



Copyright: Welsh Government

DE606 Simple uncontrolled crossings (walking, wheeling, shared use or cycle only)

Measure and brief description

This is the simplest form of pedestrian or cycle crossing where a footway, footpath, shared use path or cycle track meets the road at a dropped kerb (see **section 12.6**).

Benefits

- Alerts people driving to the presence of people crossing.
- Indicates to people walking and wheeling a suitable crossing place.
- Relatively cheap to install.

Key design features

- Tactile paving to be provided at dropped kerbs (flush) (see guidance on the use of tactile paving surfaces).
- This type of crossing is only to be used for low speeds and flows (see table 12.1).
- A coloured surface may be useful to highlight the presence of the crossing to people driving.
- The crossing may be placed on a flat topped road hump. Road humps must comply with the Highways Act 1980, Sections 90A to 90F and Highways (Road Humps) Regulations.
- Where it is not clear to people approaching the crossing while cycling that they are about to meet a road where they don't have priority, it may be safer to add markings (and possibly signs) indicating that they should give way (see DE603).
- Where there are concerns of people driving not having enough visibility to the crossing, due to the area being often busy, for example, consideration should be given to additional measures such as light coloured anti-skid surfacing for 50m either side of the crossing, rumble strips on the approaches, localised visual narrowing in vicinity of crossing and diagram 950 warning signs on the approaches (see TSRGD and table 9.2).
- Crossing distances should be reduced to a minimum, by reducing the carriageway width. Physical buildouts should be constructed if required. This will increase the visibility to the person crossing and reduce the amount of time people are exposed to the vehicles, increasing the safety of the crossing. The width of the carriageway available should not fall into the critical widths (see section 9.21). No street furniture or tall vegetation that could obscure people crossing should be installed at the buildouts.

Dimensions[39]

- a – Width of crossing to be at least as wide as the path either side. On routes for people walking and wheeling only this should be 2m min, on routes also for people cycling, 3m min.
- If raised tables are built, height should normally be 75mm, and no more than 100mm.

Other considerations

- Any coloured surface needs to maintain a good condition to remain effective and not be slippery. Skid resistance should be at least the same as the surface course where it is applied.
- The effect of parked vehicles in the vicinity of an uncontrolled crossing should be considered and if necessary parking restrictions should be imposed to maintain adequate visibility (see table 9.2 and section 9.14).
- Vehicle crossovers are not suitable as pedestrian crossing points and care should be taken over the siting of crossings relative to crossovers so as not to cause confusion to users.
- In rural locations, detectors on the approach paths can be used to trigger vehicle activated signs to alert motor traffic of the presence of an infrequently used crossing, only when there are people walking, wheeling or cycling present.

Further references

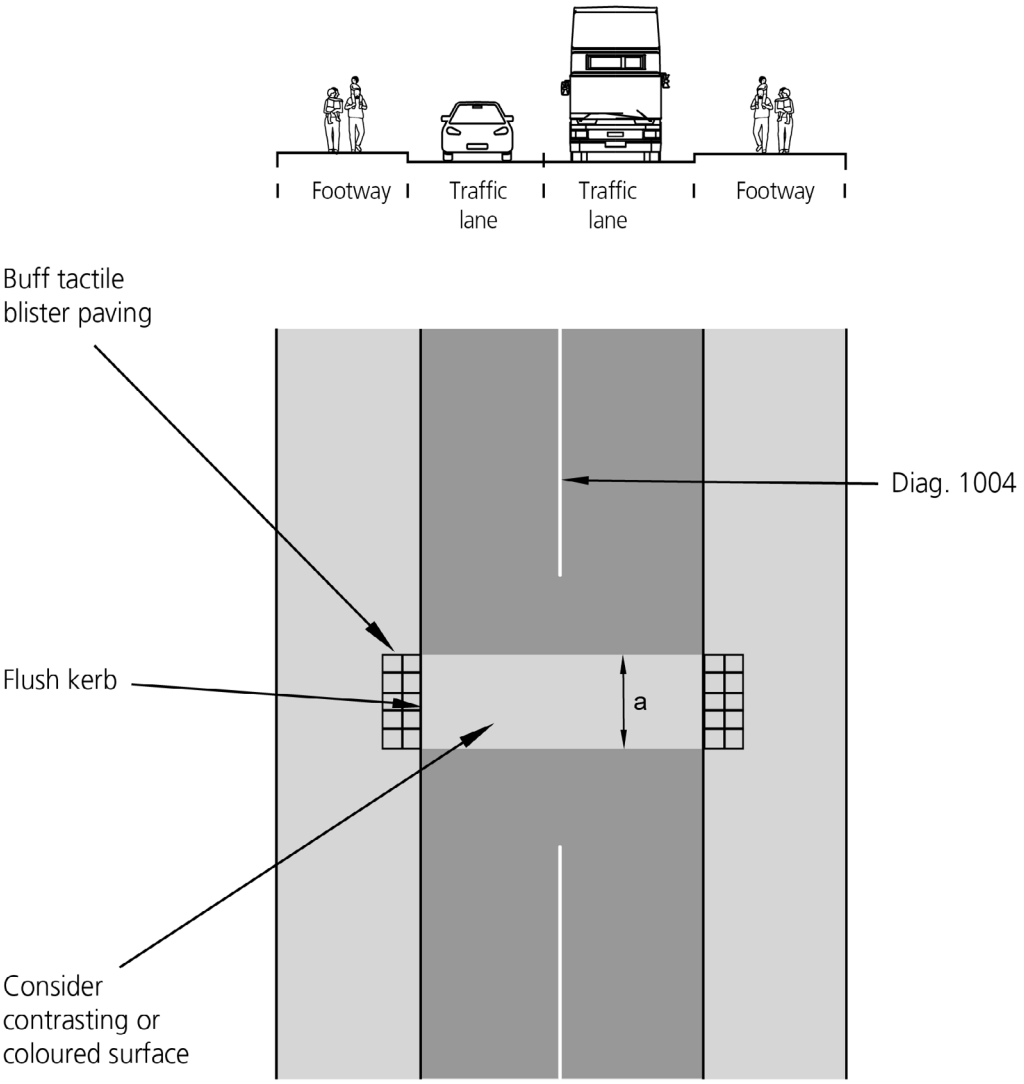
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.

39 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE606

Simple uncontrolled crossings (walking, wheeling, shared use or cycle only)

AADT:
<2000
85th percentile speed:
<33mph



Llywodraeth Cymru
Welsh Government

DE number: DE606 | Previous DE number: DE606

Do Not Scale Drawing | Revision number: 3

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DE607 Cycle priority crossing

Measure and brief description

Where a cycle track crosses a carriageway, the cycle track can be given priority over vehicles travelling along it. Care needs to be taken to ensure it is clear to motorists that they must give way, and that there is sufficient visibility along the cycle track. This type of crossing is best suited to relatively lightly trafficked streets with lower speeds (see section 12.6).

Benefits

- Continuity of cycle route.
- Minimises delay and effort for people cycling.
- Affords visible priority to people cycling.

Key design features

- Priority cycle crossings are generally suitable where main road flows are up to 4,000 vehicles per day, and 85th percentile speeds are up to 33mph (see table 12.1).
- A road hump is not a legal requirement, but is desirable to reduce traffic speeds locally.
- Road humps must comply with the Highways (Road Humps) Regulations.
- Tactile paving to be provided to alert blind and partially sighted users (see guidance on use of tactile paving).
- A coloured surface may be useful to highlight the presence of the crossing to motor traffic.
- Care should be taken to provide sufficient visibility. The crossing itself and its immediate approaches should be visible to approaching motorists at their stopping sight distance. The crossing should be lit (see section 9.14).
- Although not mandatory, give way signs to diagram 602 will usually be required at the cycle track crossing and 1003 road markings may not be sufficiently obvious to approaching drivers on their own. The give way sign should be supplemented with a variant of diagram 962.1, varied to read 'Cycle track', with Welsh Government authorisation.

Dimensions[40]

- Width of crossing to be at least as wide as the cycle track either side, 3.0m min.
- If on a raised table, height should normally be 75mm, and no more than 100mm.

Other considerations

- Where cycle approach speeds are high or visibility restricted it is preferable to use path approach geometry or humps to slow people cycling. Barriers should not be used.

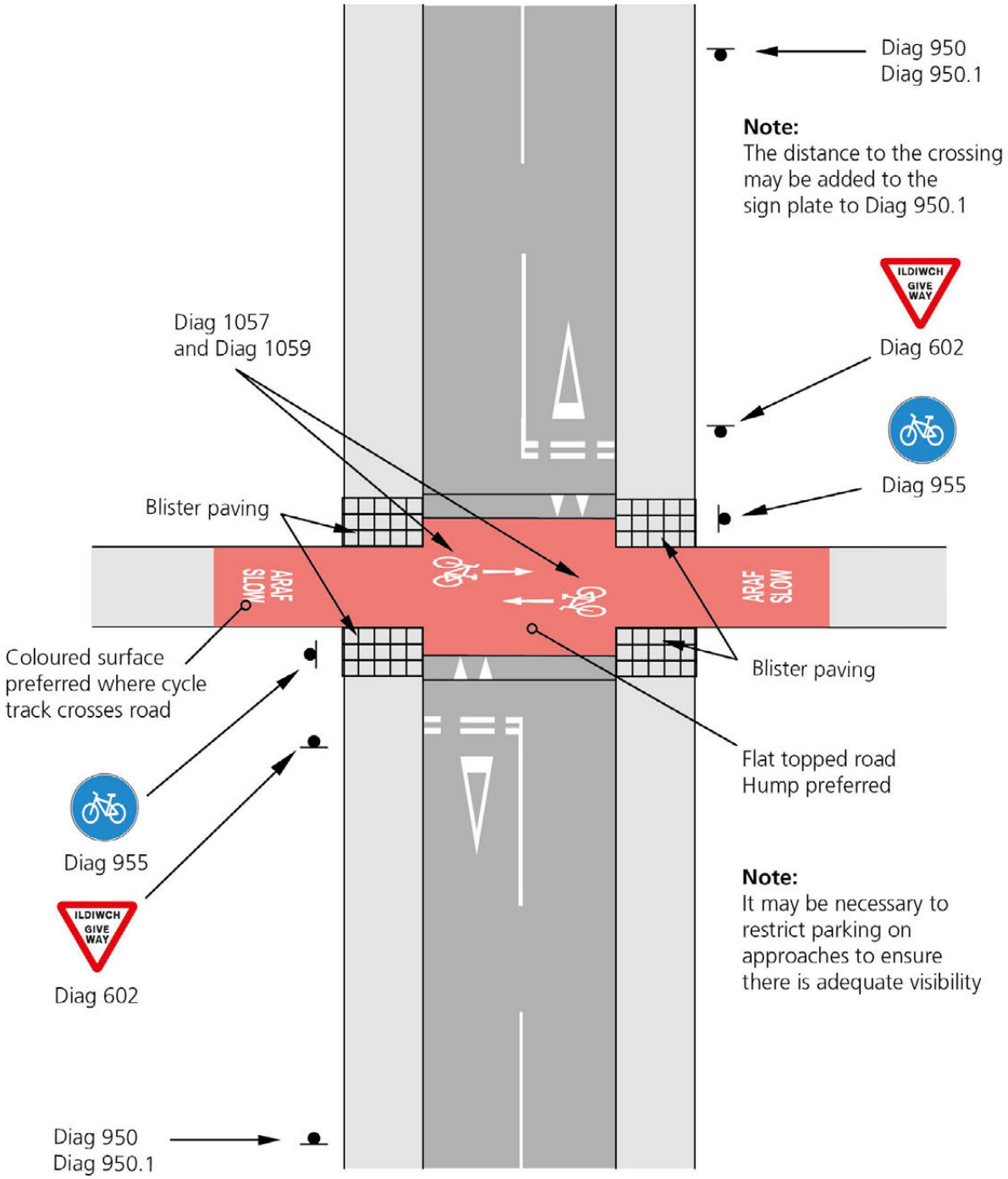
40 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Cycle priority crossings may also have central refuges (DE608).
- If people walking and wheeling are also crossing, a Parallel Crossing should be provided (DE611).

Further references

- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance in the use of tactile paving surfaces.
- TSRGD.

DE607	Cycle priority crossing	**AADT:** <4000 **85th percentile speed:** <33mph



Llywodraeth Cymru Welsh Government	DE number: DE607	Previous DE number: DE607
	Do Not Scale Drawing	Revision number: 3
	Copyright: Welsh Government	

DE608 Uncontrolled crossing with central refuge

Measure and brief description

Where the crossing of a road cannot easily be carried out in one stage due to the geometry of the street it will be necessary to provide a refuge for people walking and wheeling, and possibly cycling, to wait safely and make the crossing in two sections (see **section 12.6** and **table 12.1**).

Benefits

- A high quality refuge crossing can considerably reduce the time needed to cross as people can cross each lane at a time and have a safe space to wait in the middle.

Key design features

- Central refuges should be at least as wide as the approach paths.
- Crossings should be in a straight line.
- Refuges should be kerbed in order to provide a degree of protection and subjective safety to users.
- Flush kerbs and tactile paving should be provided in line with the dropped kerbs at the edge of the road, in the refuge and on the footways on either side (see Guidance on the Use of Tactile Paving Surfaces).
- The refuge will often (but not always) need to be marked with bollards facing approaching traffic. These bollards may need to be illuminated in some circumstances – see Traffic Advisory Leaflet 3/13 and TSRGD.
- Where there are concerns of people driving not having enough visibility to the crossing, consideration should be given to additional measures such as light coloured anti-skid surfacing for 50m either side of the crossing, rumble strips on the approaches, and beacons and diagram 950 warning signs on the approaches (see table 9.2).
- Reducing the length of the crossing by narrowing the carriageway should have priority over installing a refuge. If the flows or speeds are too high to justify not narrowing the carriageway, then an uncontrolled crossing might not be suitable for the location (see table 12.1).

Dimensions[41]

- a – Width of crossing to be at least as wide as the path either side. On walking and wheeling only routes this should be 2m min, on cycle tracks or shared use paths 3m min.

41 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- b – Depth of pedestrian refuge should be a minimum of 2m to accommodate a wheelchair and buggy, or 4m where pedestrian flow > 600/hour.
- b – Depth of refuge for use by people cycling should be a minimum of 3m to accommodate non standard cycles, including cycles towing a trailer.
- c – Refuges should not be designed to retain a running lane width of between 3.2m – 3.9m. This is unsafe as it might lead to people driving to think that they can squeeze through ahead of people cycling.

Other considerations

- The size of refuge should cater for peak flows in excess of current usage and allow for groups of people walking, wheeling and cycling (especially families) to wait together.
- The effect of parked vehicles in the vicinity of a refuge should be considered and if necessary parking restrictions should be imposed to maintain adequate visibility.
- Clutter-free (without guard railing) median islands will act as refuges for people walking, wheeling and cycling and improve visibility and the street scene.
- In rural locations detectors on the approach paths can be used to trigger vehicle activated signs to alert motor traffic of the presence of an infrequently used crossing only when there are people walking, wheeling and cycling present.

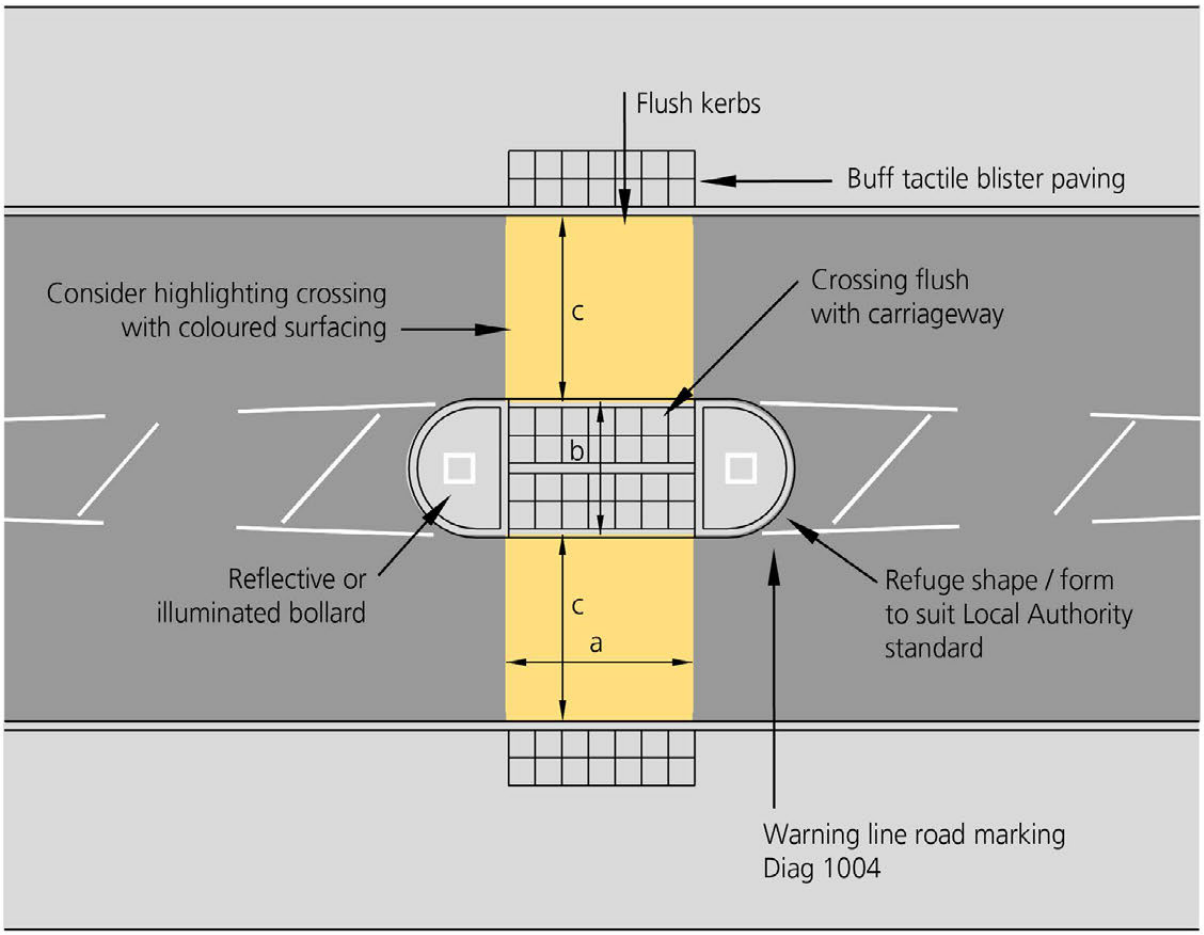
Further references

- Department for Transport (2013) – Traffic Advisory Leaflet 3/13. Traffic Bollards and Low Level Traffic Signs.
- TSRGD.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.

DE608

Uncontrolled crossing with central refuge

AADT:
<2000
85th percentile speed:
<33mph



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DE609 Cycle track on opposite side to junction

Measure and brief description

This drawing shows a simple arrangement where a two-way cycle track is on the opposite side of the road to a priority junction. In this arrangement the cycle track access essentially forms a fourth arm at the junction to create a cross roads arrangement (see **section 12.6**).

Benefits

- People cycling are able to easily travel between the separate cycle track and the carriageway of the minor road. Cycle traffic takes a logical and predictable route through the junction which is likely to be easily understood by all road users.

Key design features

- Tactile paving should be used to guide people walking and wheeling if they need to cross the cycle track (if the footway along the main road is next to the carriageway with the cycle track crossing it) (see Guidance on the Use of Tactile Paving Surfaces).
- Use of half-size Give Way markings on the cycle track.
- The cycle track should be flush with carriageway at the point of intersection.

Dimensions

- A cycle track should be sufficient to accommodate the forecast level of cycle use which is prescribed in table 9.10.

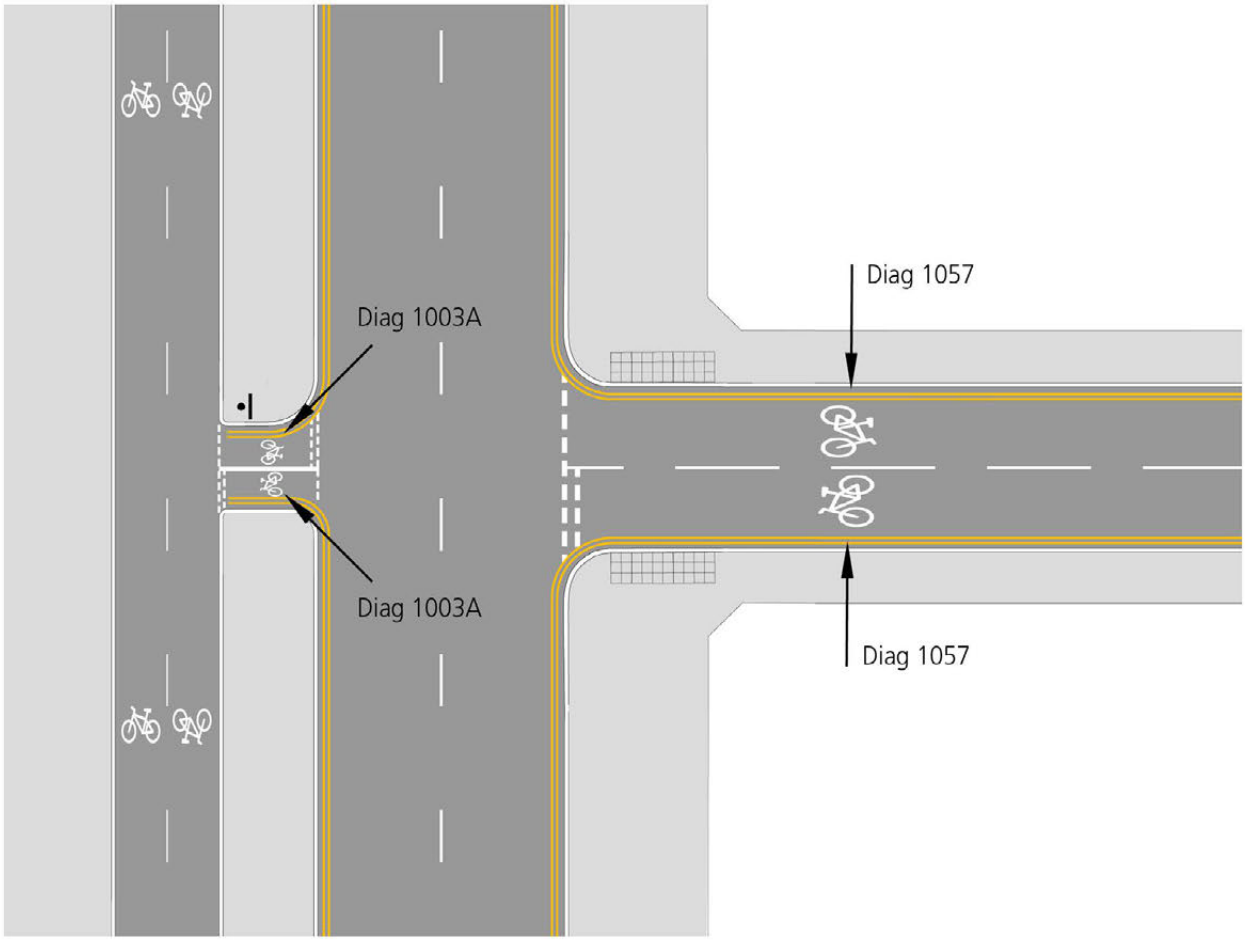
Other considerations

- This arrangement is suitable for quieter low-speed roads (85th percentile of 22mph or less) in urban areas as it includes cycling mixed with general traffic (on the side road). Where traffic speeds or flows are high, a controlled junction or crossing should be considered (see table 11.1 and table 12.1).

DE609

Cycle track on opposite side to junction

AADT:
<2000
85th percentile speed:
<22mph



Llywodraeth Cymru
Welsh Government

DE number: DE609	Previous DE number: DE609
Do Not Scale Drawing	Revision number: 2
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DE610 Zebra crossing

Measure and brief description

A zebra crossing is marked on the carriageway with transverse black and white stripes and yellow flashing globes (belisha beacons) on black and white striped poles at each side of the crossing. A person driving must stop at a zebra crossing when someone walking or wheeling starts to cross; zebra crossings are not designed to accommodate people cycling. Parallel crossings for people walking, wheeling and cycling are shown on **DE611** and cycle-only priority crossings on **DE607** (see **section 12.7** and **table 12.1**).

Benefits

- Zebra crossings provide relatively low-cost pedestrian priority crossing facilities which give an immediate response to the need to cross of people walking and wheeling.
- They can be placed closer to junctions than signalised crossings, reducing the need to deviate from desire lines.
- Refuges enable people walking and wheeling to cross carriageways in two stages (see DE608).

Key design features

- There should be adequate visibility to a zebra crossing to ensure that approaching motorists can see a person about to cross the road (see table 9.2).
- Zebra crossings may be sited on a flat-topped road hump (raised table) to slow traffic and highlight the presence of the crossing. Road humps must comply with the Highways Act 1980, Sections 90A to 90F and Highways (Road Hump) Regulations.
- The crossing distance should be minimised by narrowing the carriageway, preferably by the construction of buildouts. If not possible, a refuge, with enough space for wheelchairs, prams and mobility scooters should be considered.
- Zebra crossings can be used across minor junctions close to the give way line.
- When provided on the approach or exit from a roundabout zebra crossings should be located between 5m and 20m from the roundabout give way line.
- 8 zig-zag markings are normally provided on either side of the crossing, which prevent parking, loading or overtaking. The maximum number is 18 and the minimum number is 2.
- Tactile paving should be provided (see guidance on use of tactile paving).
- Zebra crossings are prescribed in regulation, and for that reason need to follow a set of rules (see further references below).

Dimensions[42]

- a – Crossing width: 4m minimum, 10m maximum.
- b – Distance of give way line to crossing: 1.1m minimum, 3.0m maximum.
- The zig-zag markings may be placed up to 2.0m from the kerbline, where a cycle lane or a light separated cycle track goes through a crossing, in order to highlight the continuation of the cycle space.
- Table height should normally be 75mm, and no more than 100mm.

Other considerations

- Someone blind or partially sighted would not start to cross until sure that vehicles have stopped and might therefore seek a pedestrian controlled signal crossing. Some users, such as people with learning disabilities or people who travel slower may feel safer and more comfortable using signalised crossings.
- Zebra crossings are unsuitable in locations where the 85th percentile vehicle speed is greater than 33mph or where there would be regular congestion resulting from high vehicle or pedestrian flows (see table 12.1).
- Where a zebra crossing is used on a road of two lanes or more consideration should be given to whether a vehicle stopped in the nearside lane will obstruct visibility to a person crossing from a vehicle in the off-side lane.
- Crossings may be divided by a refuge – see DE608.
- When on a cycle track, the yellow globes and the zig-zags may be excluded.
- When zebra crossings are proposed less than 5m from the junction and in 20mph areas (both roads) the yellow globes and zig zags may be omitted. The zebra becomes a side road Zebra crossing.

Further references

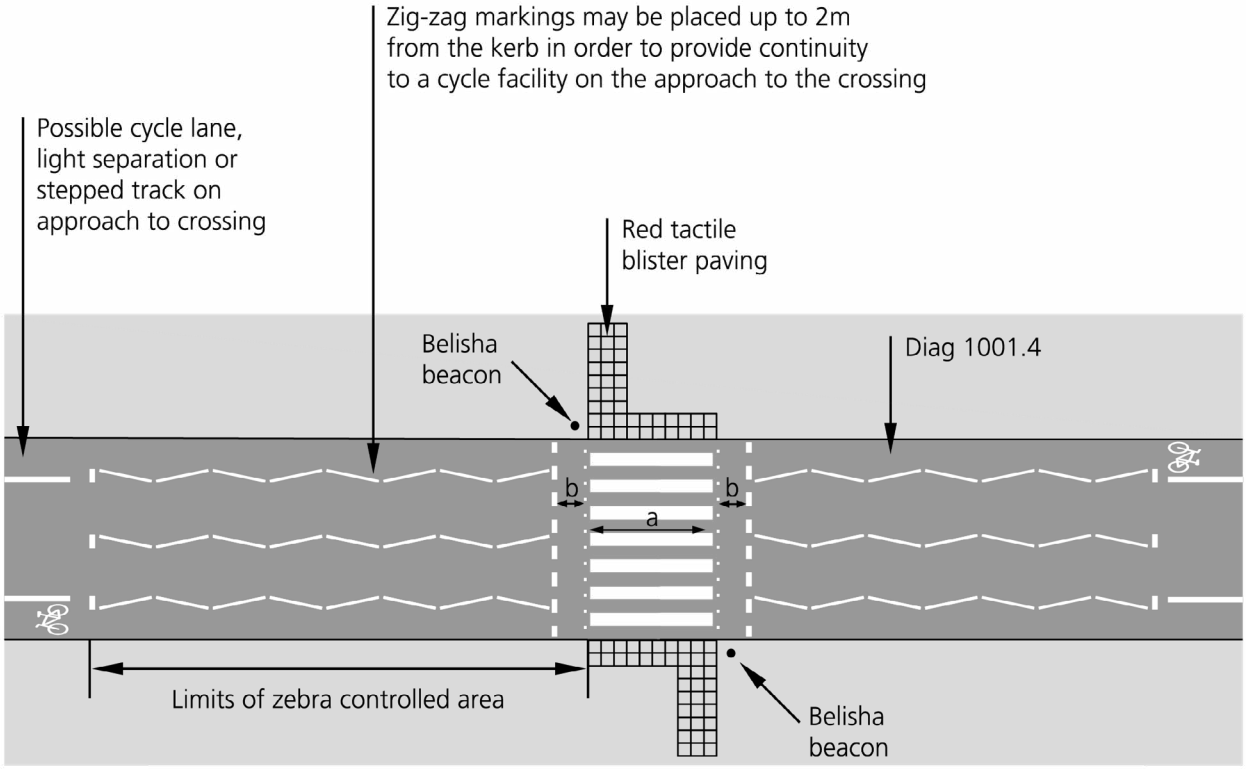
- Department for Transport (2018) – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Highways Act 1980, sections 90A to 90F.
- Side Road Zebra Crossing Guidance.

42 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE610

Zebra crossing

AADT:
<8000
85th percentile speed:
<33mph



Llywodraeth Cymru
Welsh Government

DE number: DE610 | Previous DE number: DE610

Do Not Scale Drawing | Revision number: 3

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DE611 Parallel pedestrian and cycle crossing

Measure and brief description

A parallel crossing for people walking, wheeling and cycling is marked on the carriageway with transverse black and white stripes to indicate the pedestrian crossing and elephants footprint/ diagram 1057 markings to indicate the cycle crossing, together with yellow flashing globes (belisha beacons) on black and white striped poles at each side of the overall crossing. A person driving must stop on the approach to the crossing when someone walking, wheeling or cycling starts to cross (see section 12.7).

Benefits

- Parallel pedestrian/cycle crossings provide relatively low-cost facilities which give an immediate response to the need to cross of people walking, wheeling and cycling.
- They can be placed closer to junctions than signalised crossings, reducing the need to deviate from desire lines.

Key design features

- There should be adequate visibility to a crossing to ensure that approaching motorists can see people about to cross the road (see table 9.2 and section 9.14).
- Crossings may be sited on a flat-topped road hump (raised table) to slow traffic and highlight the presence of the crossing. Road humps must comply with the Highways Act 1980, Sections 90A to 90F and Highways (Road Hump) Regulations.
- The crossing distance should be minimised by narrowing the carriageway, preferably by the construction of buildouts. If not possible, a refuge, with enough space for wheelchairs, buggies, mobility scooters and cycles (including non standard) should be considered (see DE608).
- Crossings can be used across minor junctions close to the give way line.
- When on a busier junction, crossings should be at least five metres from a side road junction, measured from the driver's position in the adjacent road.
- When provided on the approach or exit from a roundabout crossings should be located between 5m and 20m from the roundabout give way line.
- 8 zig-zag markings are normally provided on either side of the crossing, which prevent parking, loading or overtaking. The maximum number is 18 and the minimum number is 2.
- Tactile paving to be provided (see guidance on use of tactile paving).

Dimensions[43]

- a – Pedestrian crossing width: 4m minimum, 10m maximum.
- b – Distance of give way line to pedestrian and cycle crossing: 1.1m minimum, 3m maximum.
- c – Distance between pedestrian and cycle crossing: 0.4m.
- d – Cycle crossing width: 1.5m minimum, 5m maximum.
- The zig-zag markings may be placed up to 2.0m from the kerbline, where a cycle lane or a light separated cycle track goes through a crossing, in order to highlight the continuation of the cycle space.

Other considerations

- A person who is blind or partially sighted would not start to cross until sure that vehicles have stopped and might therefore seek a pedestrian controlled signal crossing. Some users, such as people with learning disabilities or people who travel slower may feel safer and more comfortable using signalised crossings.
- Parallel crossings for people walking, wheeling and cycling are unsuitable in locations where the 85th percentile vehicle speed is greater than 33mph or where there would be regular congestion resulting from high vehicle or pedestrian flows.
- Where a crossing is used on a road of two lanes or more consideration should be given to whether a vehicle stopped in the nearside lane will obstruct visibility to a crossing pedestrian or cyclist from a vehicle in the off-side lane.
- Crossings may be divided by a refuge (see DE608).

Further references

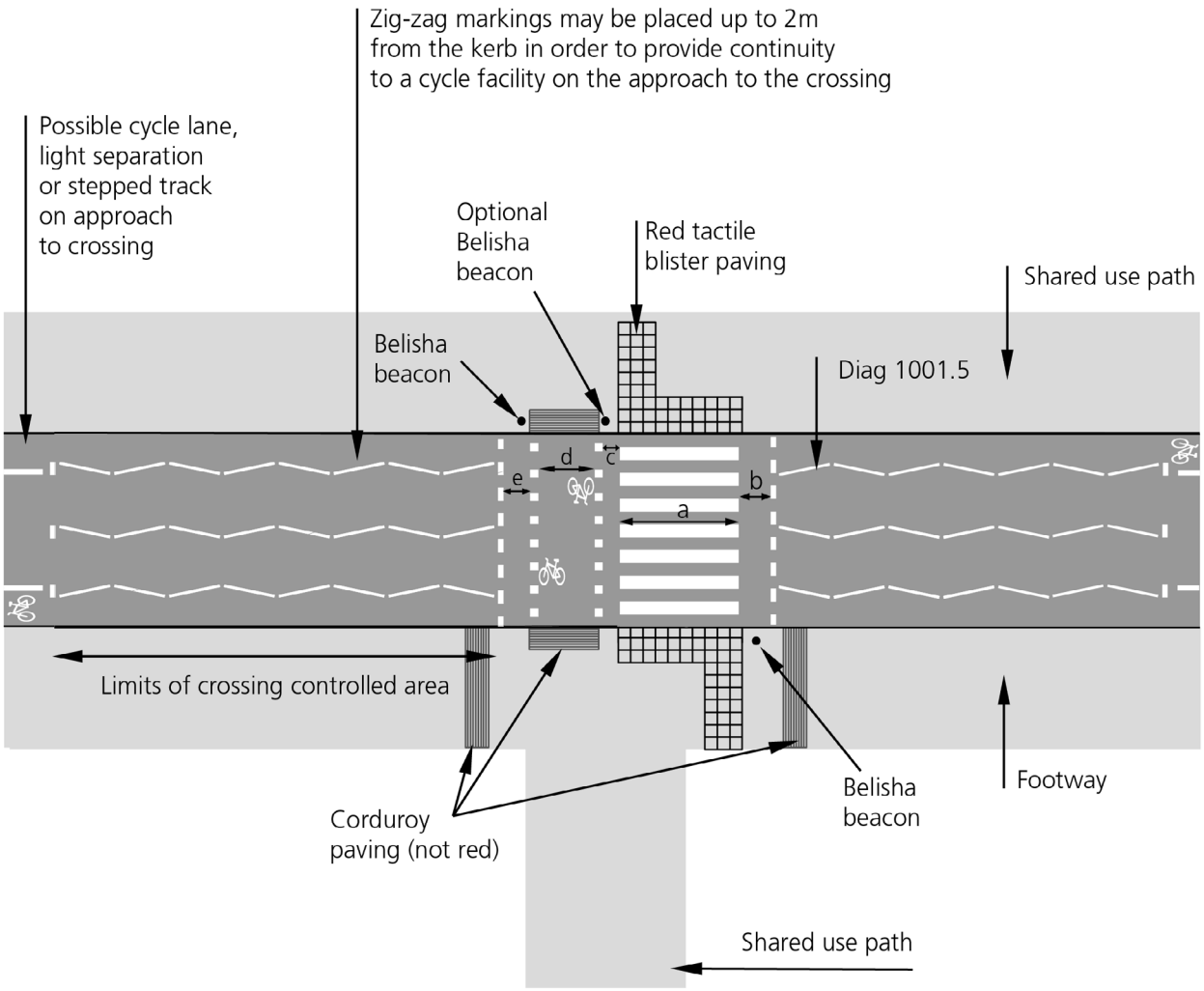
- Councils are required to advertise and consult on sinusoidal humps, flat-top humps and speed cushions under the Highways (Road Hump) Regulations.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Manual for Streets.
- Highways Act 1980, sections 90A to 90F.

43 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE611

Parallel pedestrian and cycling crossing

AADT:
<8000
85th percentile speed:
<33mph



Llywodraeth Cymru
Welsh Government

DE number: DE611	Previous DE number: DE611
Do Not Scale Drawing	Revision number: 4
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DE612 Puffin and ped-x crossings

Measure and brief description

Signal-controlled crossings – Puffin and Ped-X – follow the same traffic-signal sequence and use infrared detectors to cancel calls if pedestrians cross early (before the green man) and to adjust crossing time based on walking and wheeling speeds.

Puffin crossings feature nearside red/green signals integrated into the push-button unit, visible to people walking and wheeling, and approaching traffic. Ped-X crossings use far-side signals and can include countdown timers, though these fix clearance times and cannot, therefore, be used alongside on-crossing detection.

Pelican crossings, with a flashing amber for drivers and flashing green-man phase, are now obsolete and must not be used for new installations (see **section 12.8**).

Benefits

- Signalised crossings are generally preferred by blind and partially sighted people, people with learning disabilities, and other groups of pedestrians including older people.
- Puffin and Ped-X crossings include detector technology to extend the pedestrian crossing time so that people walking or wheeling more slowly are not disadvantaged.
- Signalised crossings are suitable for a larger range of traffic speeds and flows (see table 12.1).

Key design features

- Ped-X crossings with farside pedestrian signals are preferred by some users and are more suited to busy locations where people walking and wheeling may have difficulty seeing the nearside indicators due to crowding.
- Signal-controlled pedestrian crossings may either cross a full width carriageway in a single stage or comprise two crossings with a central refuge (see DE608).
- Crossings of single carriageways should preferably be single stage crossings with rapid push button response and recall timings.
- Single-stage crossings are preferred. Two-stage crossings may be used and are often staggered to encourage people walking and wheeling to treat each stage separately. However, straight-ahead divided crossings are more convenient and should be used wherever possible. To prevent confusion, avoid ‘see-through’ designs where people walking and wheeling might mistake a green signal on the far side for one on the near side. On wide carriageways, consideration should be given to adding a refuge for those who may struggle with longer distances, even on single stage crossings.
- Two-stage straight ahead crossings can be achieved by using nearside pedestrian aspects, a wide central median or angling the crossings in preference to introducing a stagger.

- Where central waiting areas are created they should give maximum space and comfort to waiting users at peak times considering space for wheelchairs, prams and mobility scooters (see DE608).
- The aim is to minimise waiting times at crossings. For two-stage crossings, consider an advance call on the second stage to reduce waiting time.
- It is important that sufficient time is allocated to allow all people (particularly older people) to cross the road in an efficient unhurried manner.
- Crossings should reflect desire lines, using angled crossings if they are appropriate. Crossing distances should be as short as possible.
- Tactile paving and rotating cones for blind and partially sighted users should be provided.
- Audible signals should be considered but can be intrusive in residential areas.
- 8 zig-zag markings are normally provided on either side of the crossing, which prevent parking, loading or overtaking. The maximum number is 18 and the minimum number is 2.
- The zig-zag markings may be placed up to 2.0m from the kerbline, where a cycle lane or a lightly segregated cycle track goes through a crossing, in order to highlight the continuation of the cycle space.

Dimensions[44]

- a – Crossing width: 2.4m minimum, 10m maximum.
- b – Distance of give way line to crossing studs: 1.7m minimum, 3m maximum.

Other considerations

- Standalone signal controlled crossings should generally be at least 20 metres from a side road junction.
- On the approach to or exit from a roundabout a non-staggered signal-controlled crossing should be sited either at 20 metres or more than 60 metres from the give way line. If the crossing is staggered, the crossing of the entry arm may be located between 20 metres and 60 metres from the give way line.
- Care should be taken when locating signalised pedestrian crossings in close proximity to give-way junctions, particularly roundabouts, where the presence of the vehicle signals could be misinterpreted as giving priority at the give-way junction.
- The topography of the site needs to be such that the pedestrian detectors will operate effectively.
- Crossing points should remain free from street furniture and other clutter.
- Signalised crossings should not be used where 85th percentile speeds exceed 55mph.
- Visibility at crossings and junctions should be considered on the design (see table 9.2).

Further references

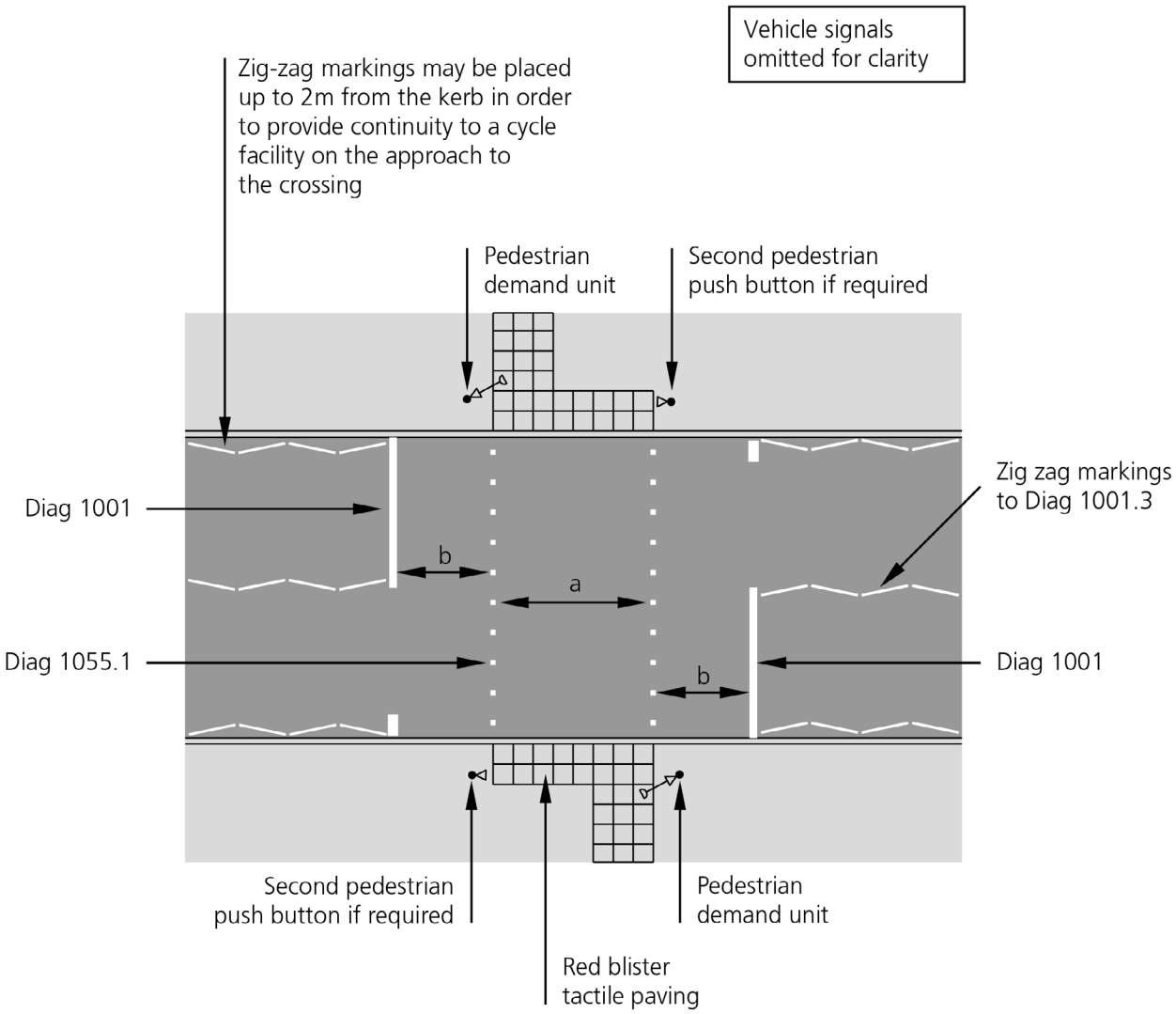
- Department for Transport – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.

44 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE612

Puffin and ped-x crossings

AADT:
Any
85th percentile speed:
<55mph



Notes

1. Ped-X crossing has farside pedestrian aspects instead of nearside.
2. Ped-X with 'Countdown' crossing is as Ped-X, with countdown display next to nearside pedestrian aspects.

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DE613 Toucan crossing

Measure and brief description

A Toucan crossing is a signal-controlled facility for people walking, wheeling and cycling, with a traffic signal sequence similar to that at signalised junctions. It uses infrared detection to cancel the crossing demand if someone crosses before the green signal activates. The detectors also measure crossing speed and adjust the crossing time accordingly. Toucan crossings feature nearside red and green signals integrated into or above the push button unit, positioned for visibility alongside approaching traffic; farside signals may also be used. They are suitable for pedestrian and cycle routes crossing busy, high-speed roads where priority (DE607) or parallel (DE611) crossings are not appropriate (see section 12.8 and table 12.1).

Benefits

- Toucans provide a compact crossing facility catering for people walking, wheeling and cycling in one location.
- Signalised crossings are generally preferred by blind and partially sighted people, those with learning disabilities, older adults, and other pedestrians. However, these groups may feel unsafe in shared spaces with people cycling, so separation should be considered.
- Toucan crossings include detector technology to extend the pedestrian/cycle crossing time so that people travelling more slowly are not disadvantaged.
- Signalised crossings are suitable for a larger range of traffic speeds and flows (see table 12.1).

Key design features

- Crossings with farside pedestrian/cycle signals may be used at busy locations where people may have difficulty seeing the nearside indicators due to crowding.
- Toucan crossings may either cross a full width carriageway in a single stage or comprise two crossings with a central refuge. When a refuge is provided, it should be wide and long enough to cater for mobility scooters and non-standard cycles (see DE608).
- Crossings of single carriageways should preferably be single stage crossings with rapid push button response and recall timings.
- Where a toucan crossing is required on a wide road, a single-stage crossing should generally be provided for widths below 15m. For widths over 15m, the option of a single-stage crossing should be fully considered in the light of existing examples. Where possible, carriageway width should be reduced at crossings with a buildout. If not feasible, consider a refuge to assist those who may struggle to cross in one movement.
- Staggered divided toucan crossings are very difficult for people cycling to use and should not normally be provided. Straight-ahead divided crossings are much more convenient for people cycling and should be used in preference. However, it will be important to avoid 'see-through' where users could mistake a green signal on the far crossing for a green signal on the near crossing.

- Two-stage straight ahead crossings can be achieved by using nearside pedestrian/cycle aspects, a wide central median or angling the crossings in preference to introducing a stagger.
- Single-stage crossings are preferred. On wide carriageways, consideration should be given to adding a refuge for those who may struggle with longer distances.
- Where central waiting areas are created they should give maximum space and comfort to waiting users at peak times (see DE608).
- The aim should be to minimise the time that people walking, wheeling and cycling have to wait at a crossing. Where a crossing has two stages consideration should be given to including an advance call on the second crossing to minimise the time that a person has to wait for the second crossing.
- It is important that sufficient time is allocated to allow all people (particularly older people) to cross the road in an efficient unhurried manner.
- Designs should also take account of the demand for people cycling and wishing to join or leave the carriageway at the crossing.
- Crossings should reflect desire lines, using angled crossings if they are appropriate.
- Tactile paving and rotating cones for blind and partially sighted users to be provided (see Guidance on the Use of Tactile Paving Surfaces).
- Audible signals should be considered but can be intrusive in residential areas.
- 8 zig-zag markings are normally provided on either side of the crossing, which prevent parking, loading or overtaking. The maximum number is 18 and the minimum number is 2.
- The zig-zag markings may be placed up to 2.0m from the kerbline, where a cycle lane or a light separated cycle track goes through a crossing, in order to highlight the continuation of the cycle space.

Dimensions[45]

- a – Minimum recommended width of crossing is 4m, although where usage is low a 3m width is allowed. Maximum permitted width is 10m.
- b – Distance of stop line to crossing studs: 1.7m minimum, 3m maximum.

Other considerations

- Signal controlled crossings should generally be at least 20 metres from a side road junction.
- On the approach to or exit from a roundabout a non-staggered signal-controlled crossing should be sited either at 20 metres or more than 60 metres from the give way line.
- When crossings are located close to a signal controlled junction, consideration should be given to linking the signals to the junction signals. The distance at which this should be considered will depend on traffic conditions but 100 metres is likely to be the minimum distance at which linking is required.
- The topography of the site needs to be such that the pedestrian detectors will operate satisfactorily.

45 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Toucans that have a long delay time before giving a green to users cause frustration and can lead to frequent attempts to cross before the green light appears. Detection systems that identify approaching people walking, wheeling and cycling can speed up the countdown timer and reduce waiting times on the side of a busy or fast moving road.
- An additional set back push button can be considered to enable some users to access the crossings without encroaching in the carriageway. Consideration should be given to access from non standard cycles, such as recumbent.
- Crossing points should remain free from street furniture and other clutter.
- Signalised crossings should not be used where 85th percentile speeds exceed 55mph.
- Visibility at crossings and junctions should be considered on the design (see table 9.2 and section 9.14).

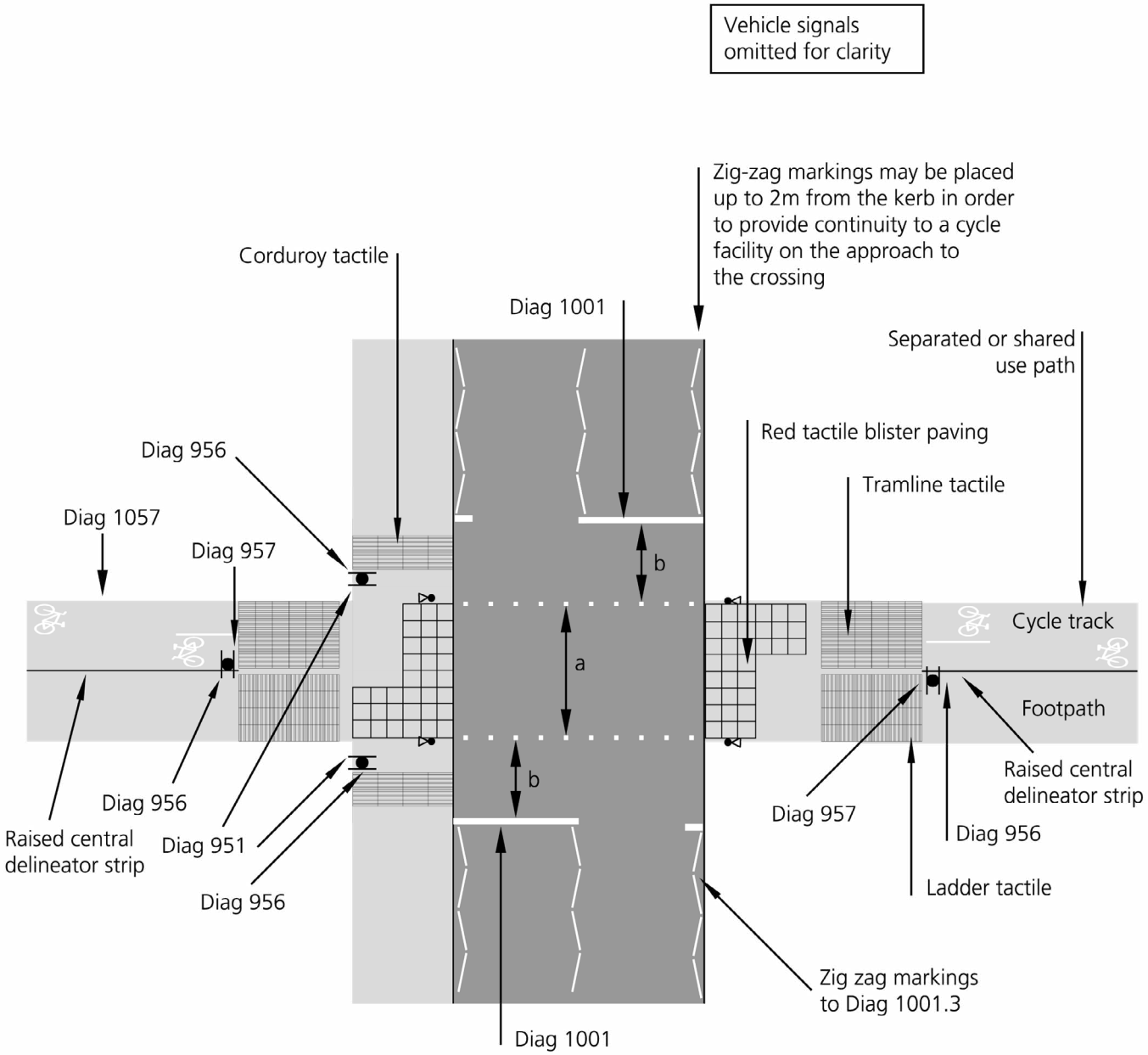
Further references

- Department for Transport (2018) – Traffic Signs Manual, Chapter 6.
- TSRGD.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.

DE613

Toucan crossing

AADT:
Any
85th percentile speed:
<55mph



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Welsh Government

DE number: DE613 | Previous DE number: DE613

Do Not Scale Drawing | Revision number: 3

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DE614 Advanced stop line

Measure and brief description

An Advanced Stop Line (ASL) enables people cycling to take up an appropriate position in the 'reservoir', or waiting area between the two stop lines, for their intended manoeuvre ahead of general traffic, before the signals change to green. A cycle feeder lane should normally be provided, which will enable people cycling to pass queuing motor traffic on the approach to the stop line. ASLs do not resolve all problems for people cycling at traffic signals. They are of no value when signals are already on green, and are inadequate for larger, complex junctions where cycle traffic should be given greater protection (see **section 12.9**).

Benefits

- Feeder lanes allow people cycling to bypass waiting traffic, and get to the ASL reservoir at the head of the queue. People cycling can position themselves where they are visible and in the correct turning lane. This is particularly helpful for people cycling who are making right turns and where there is a separately signalled left turn and people cycling wait to go ahead.
- ASLs can be used as an area for a people cycling to merge back into the carriageway from a cycle track.
- ASLs improve the comfort of people walking and wheeling, by setting waiting motor traffic back from the pedestrian crossing.

Key design features

- The design of ASLs should be site-specific. Consideration should be given to factors such as the turning traffic volumes and dominant cycle movements, signal staging, location and number of approach lanes, and vehicle swept paths.
- Feeder lanes should be provided wherever possible and should preferably be mandatory, although a wide advisory cycle lane, accepting that some vehicles may encroach, may be better than a narrow mandatory lane.
- ASL are only suitable for low flows and speeds, as otherwise people might feel unsafe and/or uncomfortable cycling with general traffic and will exclude users.
- ASLs can also operate without feeder lanes, with 'gate' markings to diagram 1001.2A, but the benefit of an ASL is much reduced if no lead in lane is provided, since people who are less confident cycling will not try to reach the reservoir.
- Feeder lanes are normally located on the nearside. Centre and offside feeder lanes can also be provided to help people cycling make specific movements. For example where there is a heavy left-turning traffic movement which conflicts with a dominant ahead or right cycle movement, the feeder lane should be positioned between the left and ahead traffic lanes.
- Feeder lanes between traffic lanes need to be wider and this is generally achievable by narrowing the traffic lanes. Continuity of cycle lanes feeding ASLs should be maintained, with traffic having to cross the cycle lane to access the left turn lane.

- On approaches to ASLs, it is important that detection loops are positioned so that they cover the approach cycle lanes as well as the general traffic lanes. Often this is not the case, resulting in people cycling not being detected on their approach. Similar considerations apply to above ground detection.
- ASLs can be partial width or staggered to suit junction layouts. These designs are useful where right turns are banned, multiple right-turn lanes exist, or vehicle paths would otherwise encroach on a full-width ASL. Evidence suggests drivers are less likely to encroach into partial-width ASLs.
- Coloured surfacing may also be used to emphasise the reservoir, which can be full or part width. Road markings should be maintained to ensure they remain visible.

Dimensions[46]

- The recommended minimum length of the reservoir for people who cycle is 5.0m – TSRGD permits a minimum of 4.0m. Longer reservoirs may be considered to satisfy demand, up to a maximum of 7.5m (or 10.0m with special authorisation).
- Nearside feeder lanes should normally be a minimum of 2m wide, and wider where possible. The absolute minimum width is 1.5m (see table 9.10).
- Central and offside feeder lanes should be a minimum of 2m wide – absolute minimum 1.5m (see table 9.10).
- General traffic lanes may be reduced to a minimum of 2.5m, which allows motor traffic not to block or encroach on the cycle lane (see section 9.21 and Manual for Streets, chapter 7).

Other considerations

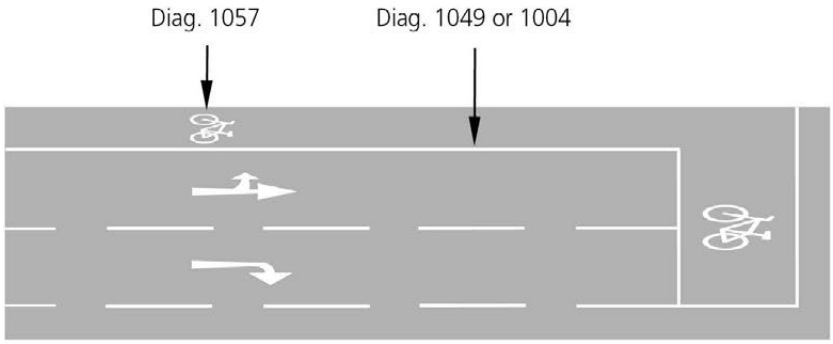
- An 'early start' signal phase for people cycling should be used, using a low-level cycle signal (primary) and/or a fourth aspect 'cycle filter' (primary or secondary). It enables people cycling that are waiting in the reservoir to start (typically up to 7 seconds) ahead of other traffic and to clear locations of potential conflict with traffic on the same arm (such as overtaking and turning left) or opposing traffic streams.
- ASLs have little or no effect on capacity if the number of all-purpose traffic lanes remains unaltered.
- Care should also be taken at signals where there are large numbers of HGVs turning left because of the potential for people cycling to move into the driver's blind spot.
- A study in London, suggested that the use of paint-only cycle lanes offer no reduction in injury risk compared to no cycling infrastructure. For this reason, this guidance only suggests their use on low speeds and flows areas (see table 11.1) but even in these cases, their suitability should be considered at a case by case basis.
- Statistics show that most casualties involving people cycling occur at junctions, therefore the junction design should be carried out carefully and prioritising the safety of all users, by the use of physical separation where feasible.

46 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

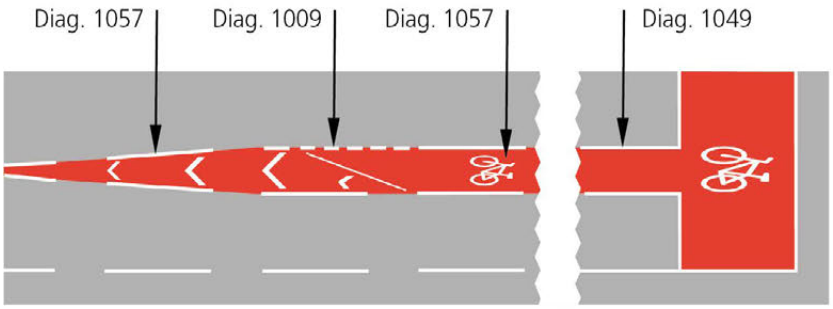
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

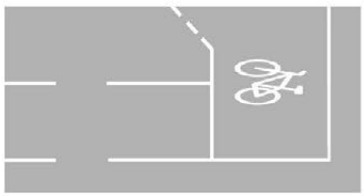
DE614	Advanced stop line	**AADT:** <5000 **85th percentile speed:** <22mph



Nearside feeder lane



Central feeder lane



Gate feeder

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DE615 Cycle bypass at traffic signals

Measure and brief description

Where space and level of use by people walking and wheeling allow, it will be beneficial to people who cycle to provide a slip off in advance of a signalised junction, leading to a short section of cycle track that enables the person cycling to bypass the red signal. This may be used to assist people cycling either to turn left or to continue straight ahead at the top of a T junction. Cycle bypasses can also be used as approach routes to cycle and pedestrian crossings in order to facilitate difficult manoeuvres (such as right turns) or to make manoeuvres which are prohibited to other traffic.

Benefits

- Reduce delays to people cycling and offer time advantages compared to other traffic.
- Formalise (and legalise) common behaviour of people when they are cycling.
- Enable people cycling to maintain momentum, improving comfort.
- Increases permeability where it enables people cycling to make manoeuvres that are prohibited for other modes.

Key design features

- Bypasses should be built within the carriageway so as not to impede flows of people walking and wheeling, but where this is impractical the bypass can be merged into a cycle track at or close to footway level.
- The design should make it clear if the facility is to be used in one or both directions.
- Cycle bypasses may, or may not, have their own set of signals phased to give early starts, or separate cycle phases. They may simply end at a give way line, discharge into a lane or track, or merge into general traffic.
- Loop detection on the approaches, and infra-red technology to detect people who cycle that are waiting, will help to speed up sequencing of traffic signals ahead.
- Careful design is required at pedestrian crossing locations.

Dimensions[47]

- Minimum 2.0m wide track (a), 1.5m for short lengths (see table 9.10).
- Margin strip (b) min 0.5m.

47 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Bypasses need to be designed to accommodate a variety of cycle types (including adapted cycles and cycles with trailers), and also be accessible to mini road sweepers.
- Poorly-accessible facilities will flood, collect litter/broken glass and become unusable.
- A protected entry to the carriageway is preferred.
- The type of cycle segregation should be proposed in accordance with table 11.1.

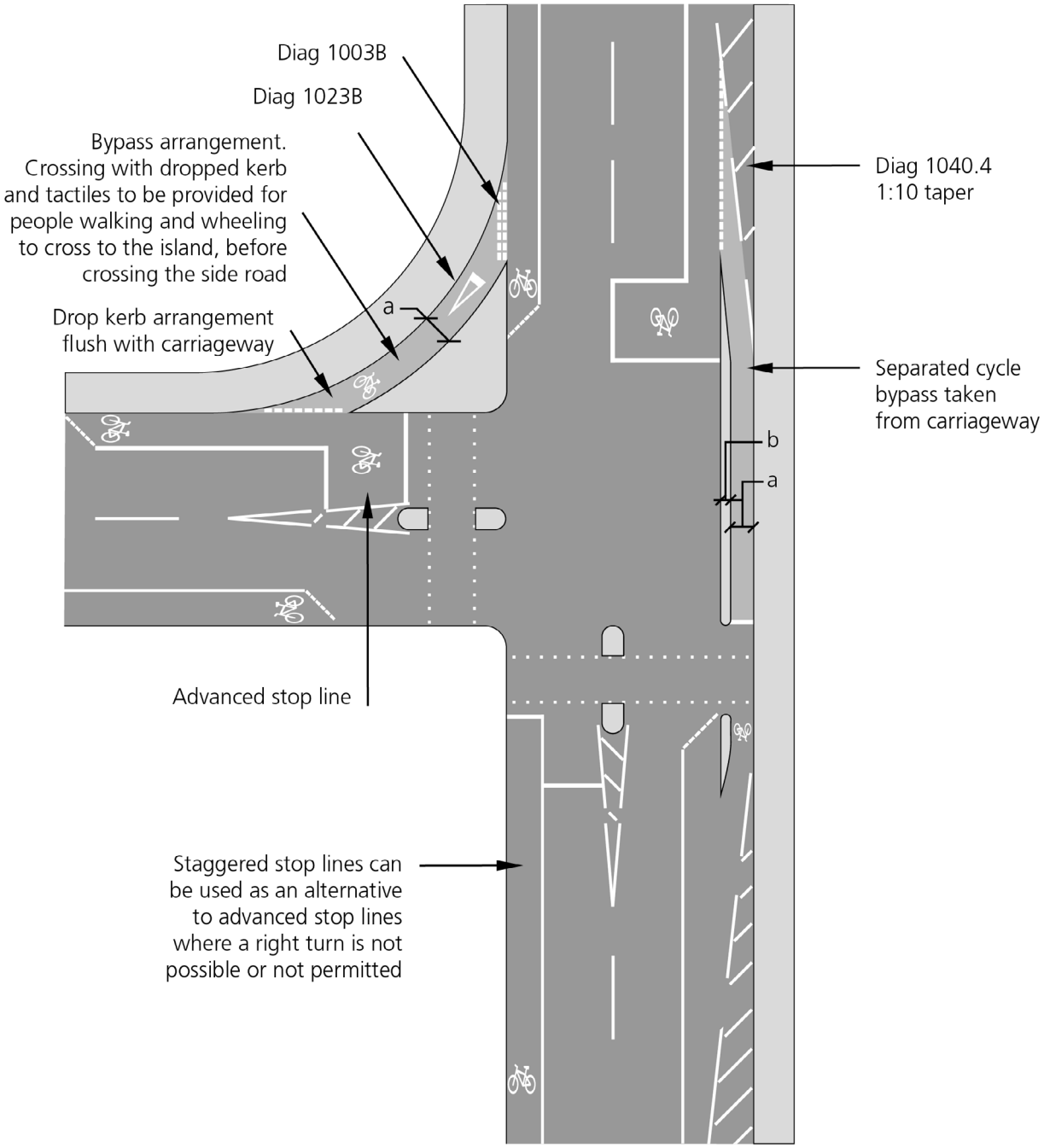
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE615

Cycle bypass at traffic signals

AADT:
<5000
85th percentile speed:
<22mph



Note:

1. Tactile paving and signal heads omitted for clarity.
2. The AADT and 85th percentile speed values suggested relate to the cycle lanes proposed in the detail. If a physical separation for cycling is proposed, the detail will be suitable for higher values (see table 11.1).

Copyright: Welsh Government

DE616 Cycle lanes through signalised junction

Measure and brief description

A cycle lane marked through a signalised junction provides a visible indication of route continuity and increases drivers' awareness of key cycle movements. They are used to indicate route continuity and protect space for desire lines of people who cycle through major junctions on cycle routes (see section 12.9).

Benefits

- Help to guide people cycling.
- Raise the awareness of people driving that a junction forms part of a recognised cycle route.
- They are particularly beneficial for large and complex junctions.

Key design features

- Route markings should comprise diagram 1010 markings or alternatively advisory cycle lane markings (diagram 1004).
- Consider highlighting with coloured surfacing, due to being a high conflict point.

Dimensions[48]

- a – Width of cycle lane on approaches refer to DE301 and DE302.
- b – Width of cycle lane through junction to be at least 0.5m wider than the approach cycle lane, where movements are generally straight ahead, and traffic mostly passes people cycling on their right. Minimum 2.5m is recommended for one-way cycle lanes and 3.0m for two-way cycle lanes (depending on the volume of people cycling, see table 9.10).
- b – Width of cycle lane through the junction to be at least 1.0m wider than the approach lane, where traffic is likely to be moving on both sides of people cycling.

Other considerations

- Where people cycling have several cross cutting desire lines through a junction, attempting to mark these may be confusing and counter-productive.
- Route markings through junctions will be subject to high levels of wear and will require maintenance.

48 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Further references

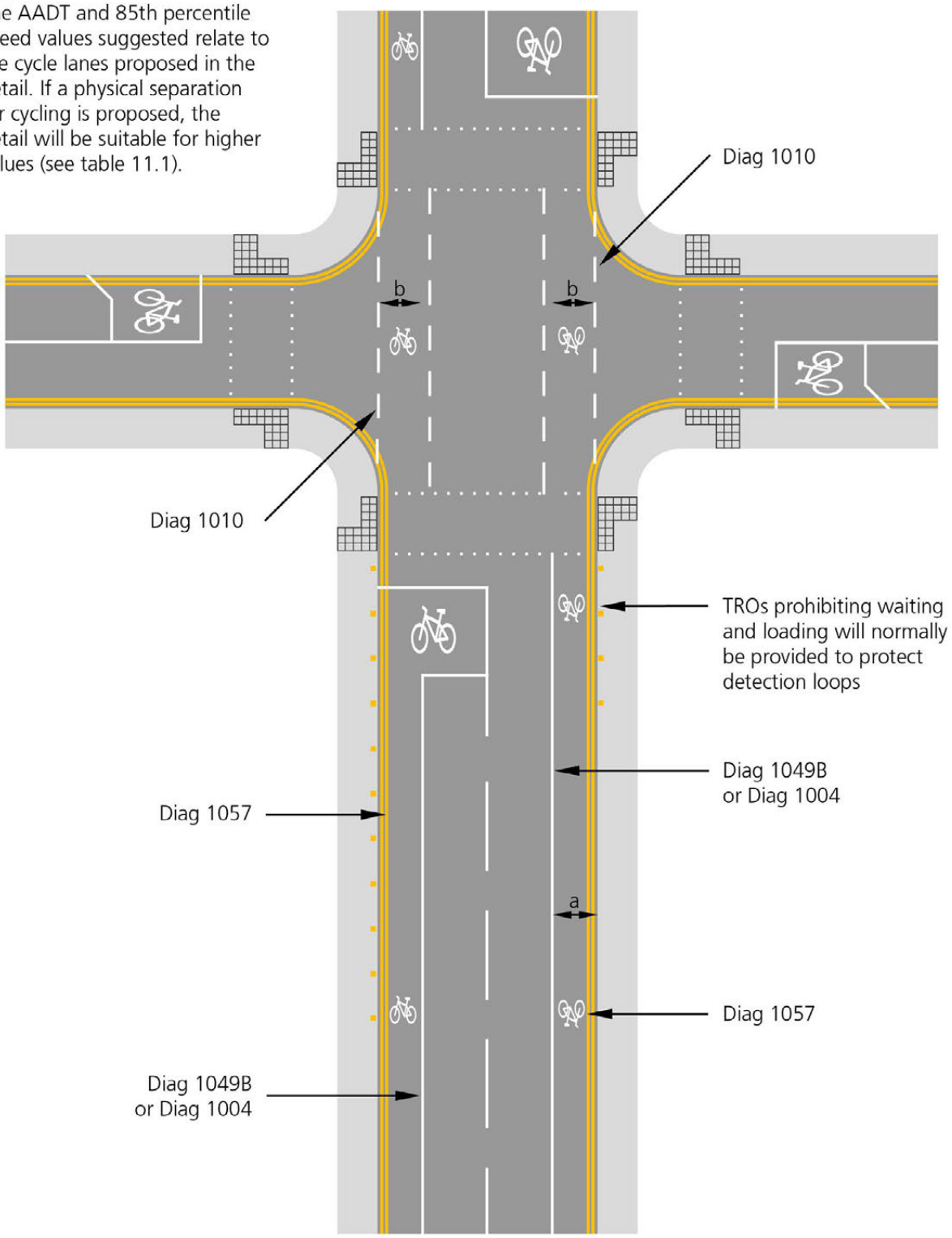
- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE616

Cycle lanes through signalised junction

AADT:
<5000
85th percentile speed:
<22mph

Note:
The AADT and 85th percentile speed values suggested relate to the cycle lanes proposed in the detail. If a physical separation for cycling is proposed, the detail will be suitable for higher values (see table 11.1).



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DE number: DE616 | Previous DE number: DE616

Do Not Scale Drawing | Revision number: 3

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DE617 Two-stage right turn at traffic signals

Measure and brief description

This design provides for people cycling to turn right at a multi-lane approach to a signalised junction, where the speed and volume of motor traffic makes the execution of a conventional right turn hazardous and unpleasant. Instead of making a direct right turn, people cycling pull into the left-side road and wait for its green signal, then cross straight to complete the turn (see section 12.9).

Benefits

- People cycling are able to make a safe right turn off a busy road, without having to weave across traffic lanes.

Key design features

- The waiting area can be marked with a cycle symbol (diagram 1057) and right turn arrow (diagram 1059), backed with coloured surfacing if needed.
- The waiting area must be clear of any pedestrian crossing on the side road and sufficiently far back from ahead traffic on the main road for people who are cycling waiting there to feel safe. It should be clear of any cycle lane across the junction.
- Waiting area should be of sufficient size for the number of people cycling waiting to turn.
- People cycling rely on the secondary signal on the side road to know when they can make the second stage of the turn, so this must be located where people cycling can see it.

Dimensions[49]

- a – Width of cycle infrastructure on approaches (see table 9.10).
- b – Width of cycle lane through junction to be at least 0.5m wider than the approach cycle lane where movements are generally straight ahead, and traffic is likely to pass people cycling only on their right.
- Minimum width lanes of 2.5m are recommended where traffic can be moving on both sides of people cycling.
- b – Width of cycle lane through junction to be at least 1.0m wider than the approach, where traffic is likely to be moving on both sides of people cycling.

49 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

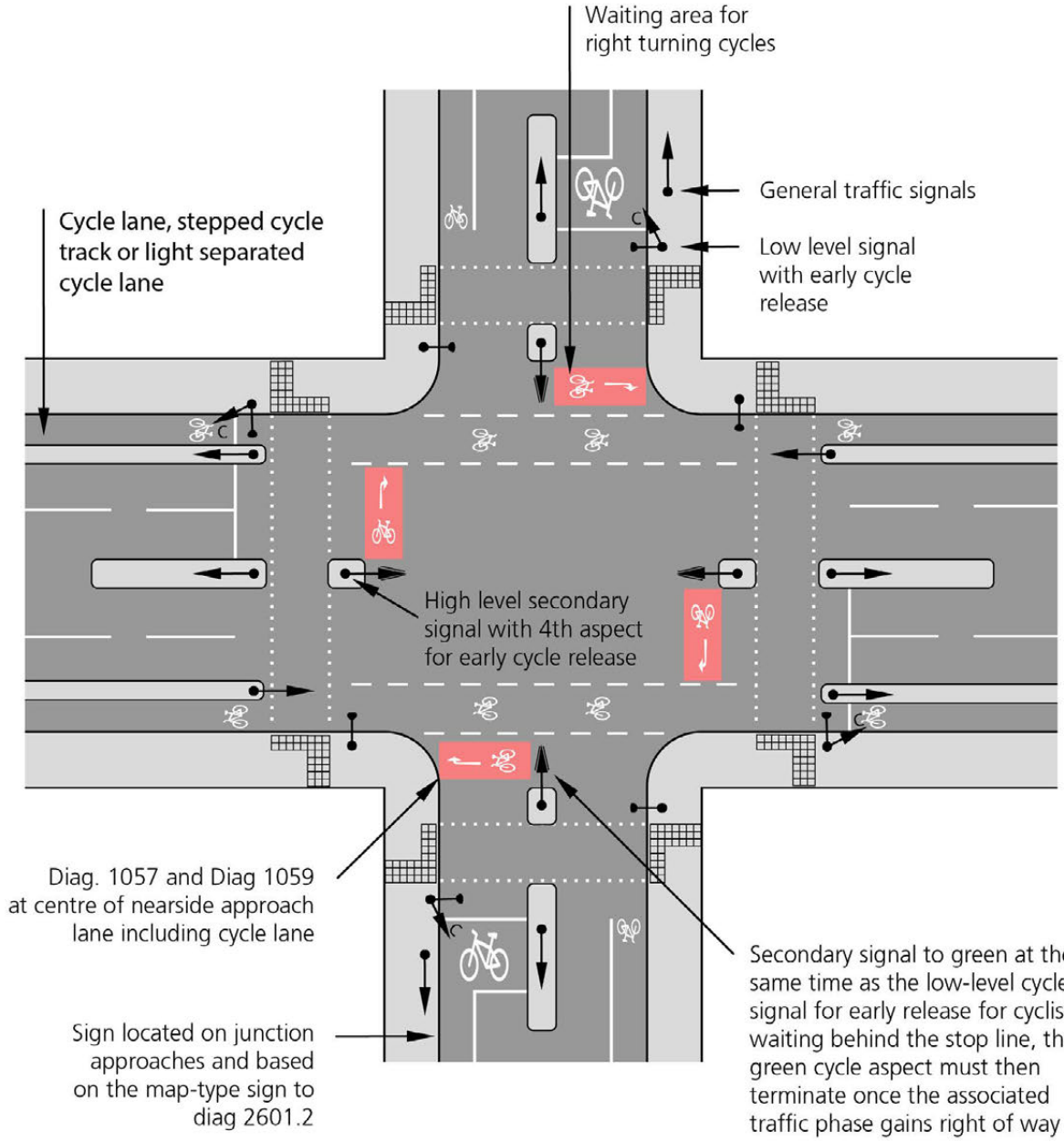
Other considerations

- Where people cycling have several cross cutting desire lines through a junction, attempting to mark these may be confusing and counter-productive.
- Route markings through junctions will be subject to high levels of wear and will require maintenance more often.

Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE617	Two-stage right turn at traffic signals	**AADT:** Any **85th percentile speed:** ≤55mph



Note:
The values for AADT and 85th percentile speeds suggested relate to the main road and the fully kerbed cycle track with a verge (see table 9.10 for verge widths) proposed on the detail. For a different level of cycle protection, such as the cycle lane on the side roads, different values apply (see table 11.1).

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DE618 Hold the left turn

Measure and brief description

A cycle lane marked through a signalised junction provides a visible indication of route continuity and increases drivers' awareness of key cycle movements. They are used to indicate route continuity and protect space for the desire lines of people cycling through major junctions on cycle routes (see **section 12.9**).

Benefits

- Help to guide people cycling.
- Raise the awareness of people driving that a junction forms part of a recognised cycle route.
- They are particularly beneficial for large and complex junctions.

Key design features

- Route markings should comprise diagram 1010 markings or alternatively advisory cycle lane markings (diagram 1004).
- Consider highlighting with coloured surfacing.

Dimensions[50]

- a – Width of cycle infrastructure on approaches (see table 9.10).
- b – Width of cycle lane through junction to be at least 0.5m wider than the approach cycle lane where movements are generally straight ahead, and traffic is likely to pass people cycling only on their right.
- Minimum width lanes of 2.5m are recommended where traffic can be moving on both sides of people cycling.
- b – Width of cycle lane through junction to be at least 1.0m wider than the approach, where traffic is likely to be moving on both sides of people cycling.

Other considerations

- Where people cycling have several cross cutting desire lines through a junction, attempting to mark these may be confusing and counter-productive.
- Route markings through junctions will be subject to high levels of wear and will require maintenance.

50 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Further references

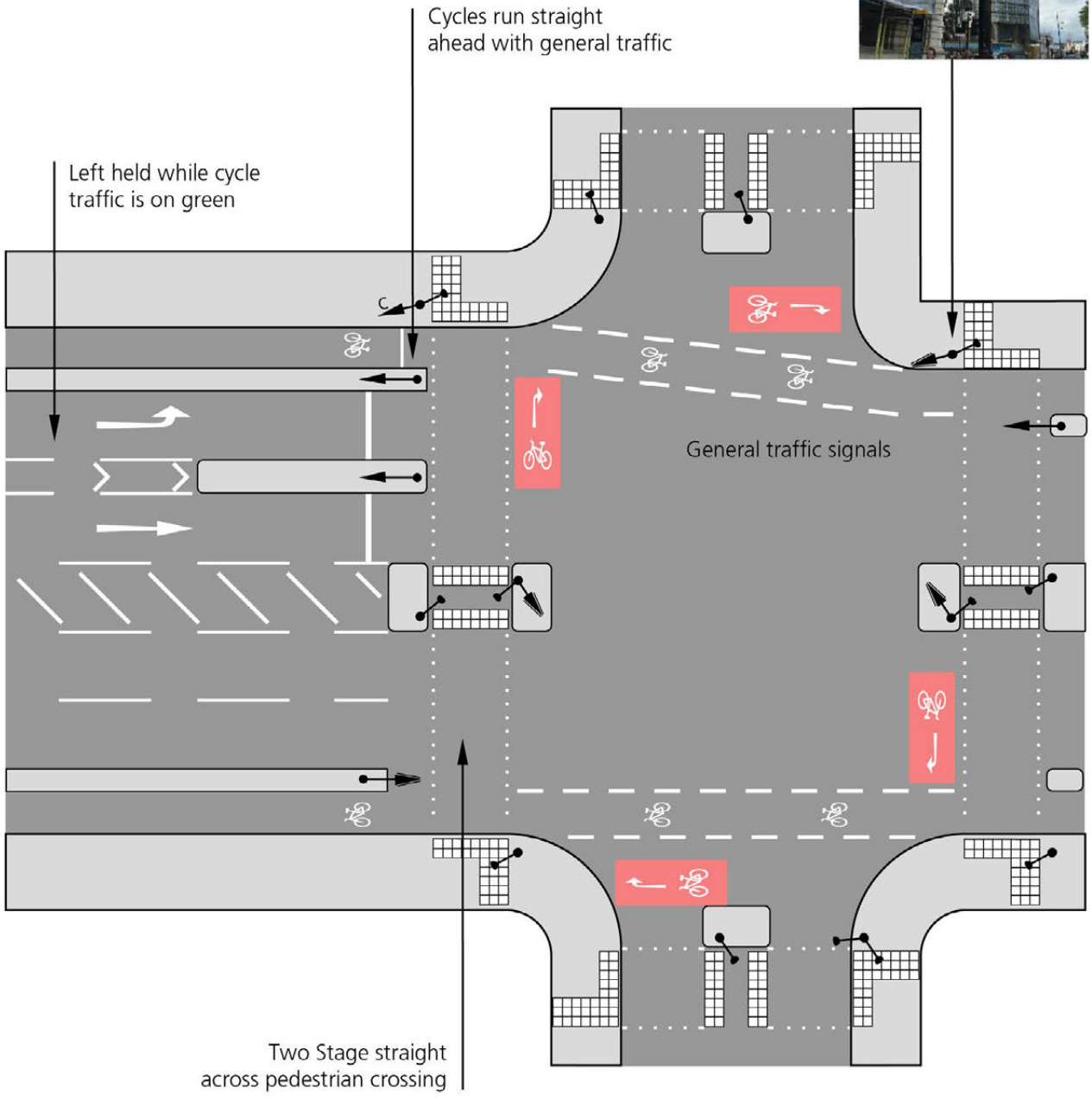
- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE618

Hold the left turn

AADT:
Any
85th percentile speed:
≤55mph





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Welsh Government

DE number: DE618	Previous DE number: DE618
Do Not Scale Drawing	Revision number: 3
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DE619 Protected junction

Measure and brief description

A cycle lane marked through a signalised junction provides a visible indication of route continuity and increases awareness of people driving of key cycle movements. They are used to indicate route continuity and protect space for the desire lines of those cycling through major junctions (see section 12.9).

Benefits

- Help to guide people cycling.
- Raise the awareness of people driving that a junction forms part of a recognised cycle route.
- They are particularly beneficial for large and complex junctions.

Key design features

- Route markings should comprise diagram 1055.3 markings.
- Consider highlighting with coloured surfacing.

Dimensions[51]

- a – Width of cycle infrastructure on approaches (see table 9.10).
- b – Width of cycle lane through junction to be at least 0.5m wider than the approach cycle lane where movements are generally straight ahead, and traffic is likely to pass people cycling only on their right.
- Minimum width lanes of 2.5m are recommended where traffic can be moving on both sides of people cycling.
- b – Width of cycle lane through junction to be at least 1.0m wider than the approach, where traffic is likely to be moving on both sides of people cycling.

Other considerations

- Where people cycling have several cross cutting desire lines through a junction, attempting to mark these may be confusing and counter-productive.
- Route markings through junctions will be subject to high levels of wear and will require maintenance.

51 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

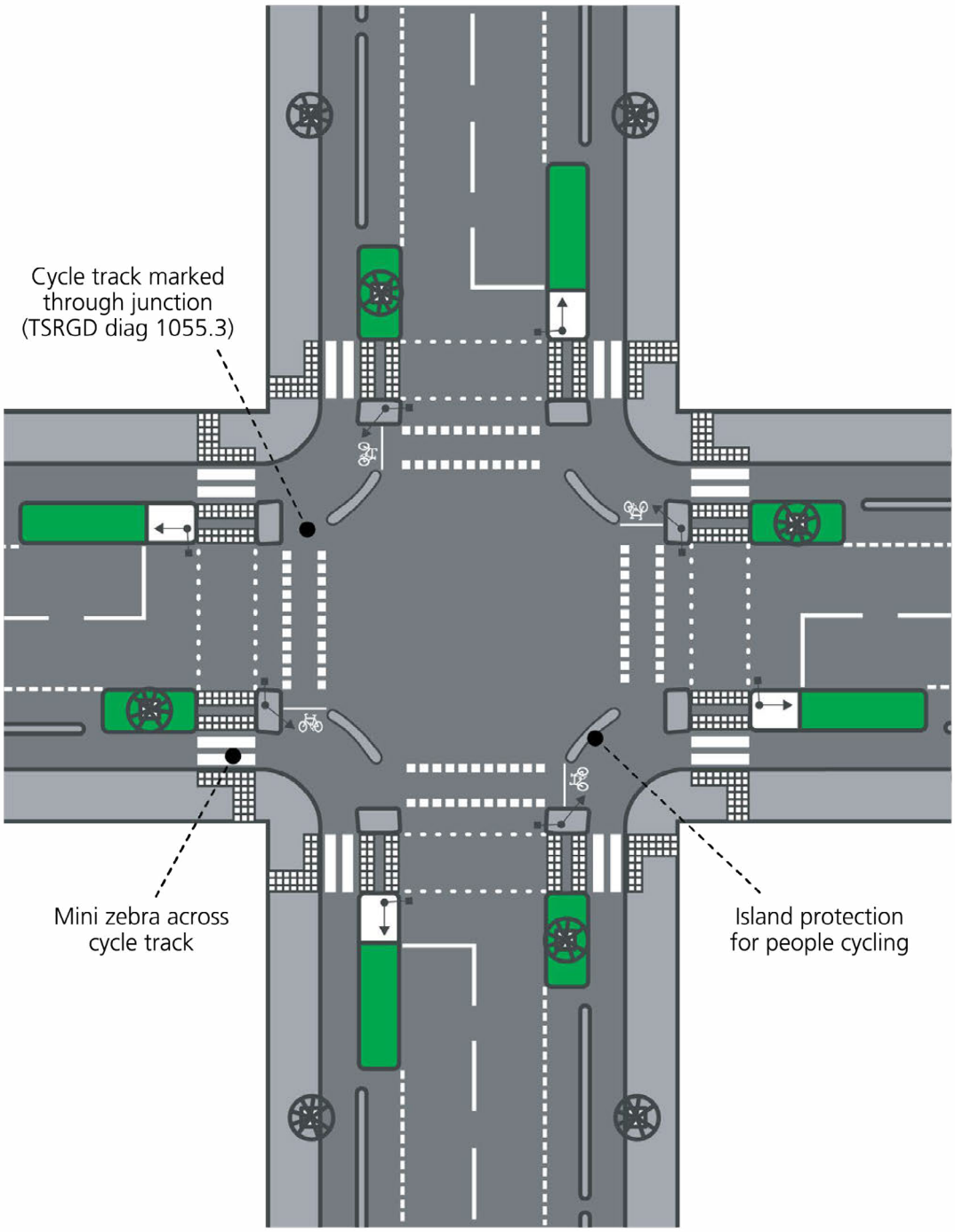
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.

DE619

Protected junction

AADT:
Any
85th percentile speed:
≤55mph



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DE number: DE619 | Previous DE number: DE619

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DE620 Cycle track alongside one-way carriageway at cross-roads

Measure and brief description

This detail and plan is provided to assist with the design options process and will need to be amended to suit each particular junction or crossing (see **section 12.9**).

Benefits

- Walking, wheeling and cycling traffic is able to make a full range of movements through the junction with physical separation and at different stages from motorised traffic.

Key design features

- Tactile paving is used to guide people walking and wheeling to the crossing facilities (see Guidance on the Use of Tactile Paving Surfaces).
- People walking and wheeling cross the cycle track and carriageway in one stage.
- The cycle route along the primary road is marked through the junction with elephants footprints (diagram 1055.3) and coloured surfacing.
- Low-level cycle signals can be used at the stop lines for the cycle track and as repeaters by the advanced stop lines.

Dimensions[52]

- Pedestrian crossing area should normally be 3m width (DE612), cycle lanes 2.5m and two-way cycle tracks 3.0m (depending on flows, see table 9.10) and pedestrian refuge areas minimum 2.0m (DE608).
- Advanced stop lines should be arranged as in DE614.

Other considerations

- Surface markings on the carriageway at junctions will be subject to high levels of wear and will require maintenance more often.

Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.

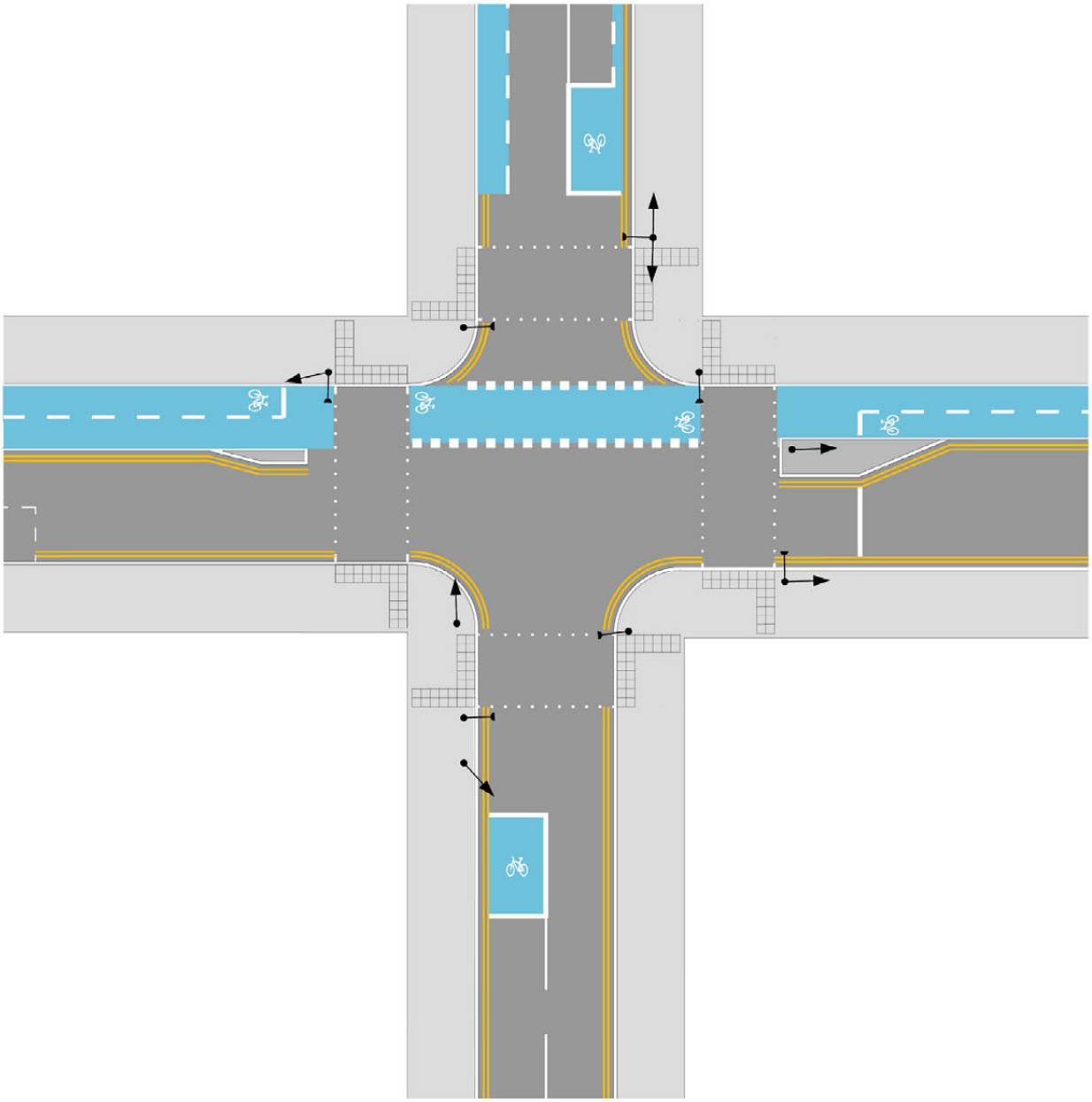
52 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE620

Cycle track alongside one-way carriageway at cross-roads

AADT:
Any
85th percentile speed:
<22mph



Note:
The values for AADT and 85th percentile speeds suggested relate to the main road and the fully kerbed cycle track with a verge (see table 9.11 for verge widths) proposed on the detail. For a different level of cycle protection, such as the cycle lane on the side roads, different values apply (see table 11.1).

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DE621 Parallel signalled controlled crossing

Measure and brief description

This drawing shows a signal controlled crossing arrangement where a two-way cycle track swaps from one side of the road to the other. The arrangement enables walking, wheeling and cycling traffic to cross in the same stage, but with physical separation from each other.

This detail and plan is provided to assist with the design options process and will need to be amended to suit each particular junction or crossing (see **section 12.9**).

Benefits

- The facility provides a way for walking, wheeling and cycling traffic to be protected at the point where a facility swaps from one side of the road to the other.
- Walking, wheeling, and cycling traffic is separated, unlike at a toucan crossing.

Key design features

- Tactile paving should be used to guide people walking and wheeling (see guidance in the use of tactile paving surfaces).
- The cycle track should be flush with carriageway at the point of intersection.
- The cycle crossing is marked by elephants footprint markings (diagram 1055.3) (if coloured surfacing is being used on the cycle track links or conflict points, this should also be used within the crossing area).
- Loop detectors and auxiliary push-buttons can be used to call the cycle crossing signal.

Dimensions[53]

- Footways (DE101) and pedestrian refuge areas 2.0m width (DE608).
- Cycle lanes, desirable minimum of 2.0m, and two-way cycle tracks a desirable minimum of 3.0m width depending on volume (see table 9.10).
- Pedestrian crossing arranged as in DE612.

Other considerations

- Depending on the exact arrangement, the pedestrian crossing of the cycle track may be either signal controlled or a zebra crossing.

53 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

- A small flat-topped hump can be placed on the cycle track at the area where people who walk and wheel cross, to ensure people cycling slow down and give way to people walking and wheeling.
- Special authorisation is required if the cycle track crosses the carriageway at an angle.

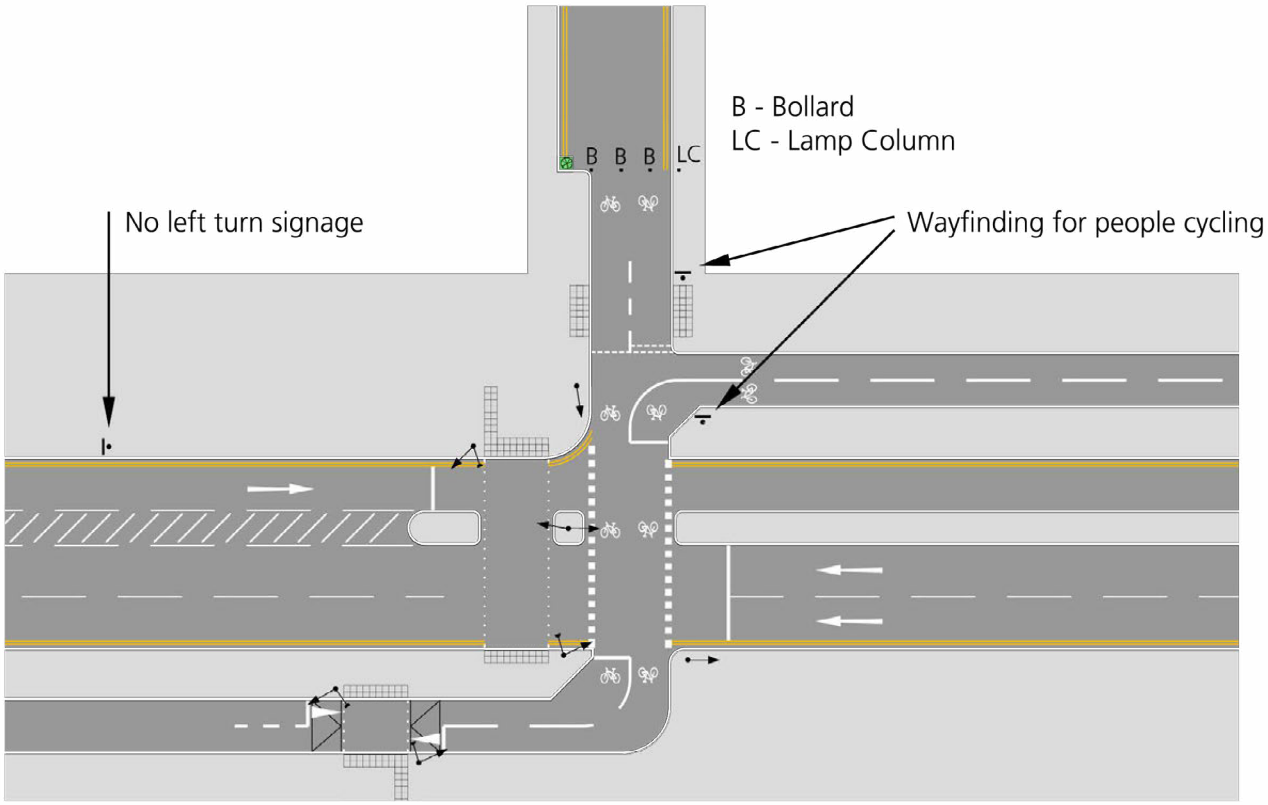
Further references

- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.

DE621

Parallel signalled controlled crossing

AADT:
Any
85th percentile speed:
≤55mph



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DE number: DE621	Previous DE number: DE621
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DE622 Two-way cycle track at larger cross-roads

Measure and brief description

This drawing shows the potential arrangement to accommodate all movements where a two-way cycle track along a main road intersects with a minor road where there is on-carriageway cycling. The junction is signal controlled, with advanced stop lines for people cycling on the minor arms and signal control of the cycle track. Pedestrian crossing areas are also signal controlled.

This detail and plan is provided to assist with the design options process and will need to be amended to suit each particular junction or crossing (see **section 12.9**).

Benefits

- Walking, wheeling, and cycling traffic is able to make a full range of movements through the junction with physical separation and at different stages from motorised traffic.

Key design features

- Tactile paving is used to guide people walking and wheeling to the crossing facilities (see guidance in the use of tactile paving surfaces).
- People who walk and wheel cross the cycle track and carriageway in one stage.
- Cycle traffic turning across the main road carriageway into the minor road does so from a turning pocket marked in the carriageway.
- Low-level cycle signals can be used at the stop lines for the cycle traffic.

Dimensions[54]

- Footways (DE101) and pedestrian refuge areas 2.0m width (DE608).
- Cycle lanes, desirable minimum of 2.0m, and two-way cycle tracks a desirable minimum of 3.0m width depending on volume (see table 9.10).
- Pedestrian crossing arranged as in DE612.

Other considerations

- Surface markings at junctions will be subject to high levels of wear and will require maintenance more often.
- The number of signalling stages required will add delay for all users. This could lead to compliance issues with walking, wheeling and cycling traffic using intergreen time to cross rather than waiting for their turn in the staging, particularly in quieter periods when there is less opposing traffic.

54 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Further references

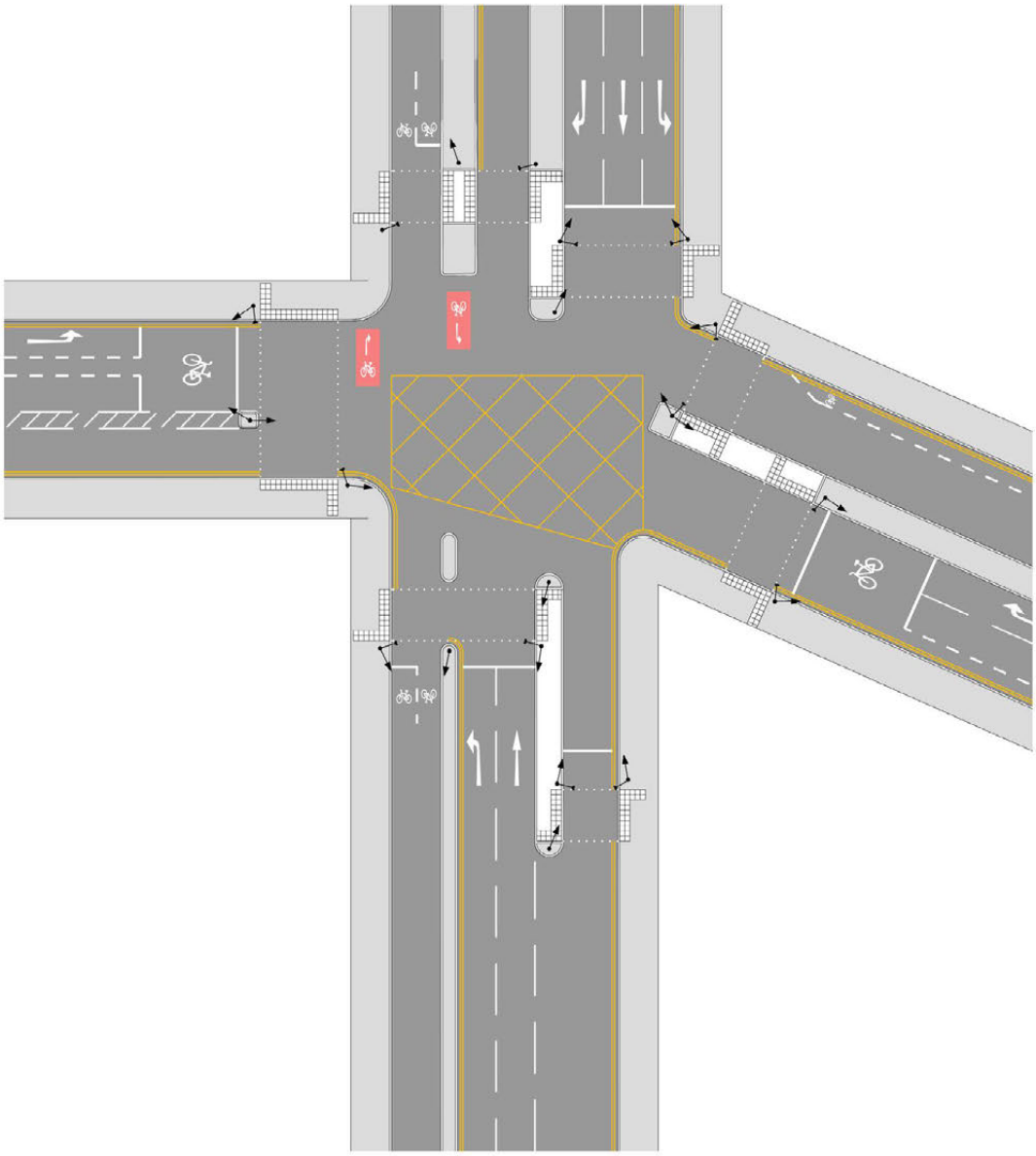
- Department for Transport – Traffic Signs Manual, Chapter 3.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- Adams, Thomas, and Rachel Aldred. 2020. Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure.
- TSRGD.

DE622

Two-way cycle track at larger cross-roads

AADT:
Any

85th percentile speed:
<33mph



Note:
The values for AADT and 85th percentile speeds suggested relate to the main road and the cycle track proposed on the detail, with a narrow verge (see table 9.11 for verge widths). For a different level of cycle protection, such as the cycle lane on the side roads, different values apply (see table 11.1).

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DE623 Mini roundabout

Measure and brief description

Mini roundabouts with an inscribed circle diameter of up to 15m suit low-traffic, low-speed areas as alternatives to priority junctions. Their tight radii slow vehicles and supports traffic calming. Single-lane approaches let cyclists and drivers pass in one stream, providing a compact, low-cost way to boost junction capacity without using signals (see **section 12.10**).

Benefits

- Single circulatory carriageway puts people cycling in the sight line of people driving.
- Traffic calming effect, especially where they are installed on raised tables.
- Slower speeds which aid the comfort and safety of people cycling, especially those wanting to turn right.
- Potential reduction in traffic delay compared to priority junctions.

Key design features

- Single lane entries and exits.
- Domed central roundel.
- Deflection of traffic.
- Any cycle lanes on approaches should end 20-30m in advance of the give way line so that people cycling mix with traffic on the junction approach.

Dimensions[55]

- Outer radius (R1) 5m-7.5m.
- Radius of central roundel (R2) 0.5m-2m.

Other considerations

- Consider incorporating a raised table.
- Consider incorporating deflector islands.
- Busier four arm and combinations of double roundabouts can be uncomfortable and less safe from the perspective of a person cycling.
- The impact upon and the ability of people who walk and wheel to cross the carriageway.
- Impact on long vehicles and buses may be an issue.

55 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Further references

- Welsh Government – DMRB CD116, Geometric Design of Roundabouts.
- Manual for Streets.
- TSRGD.

DE623

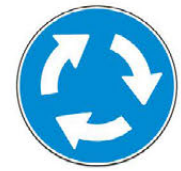
Mini roundabout

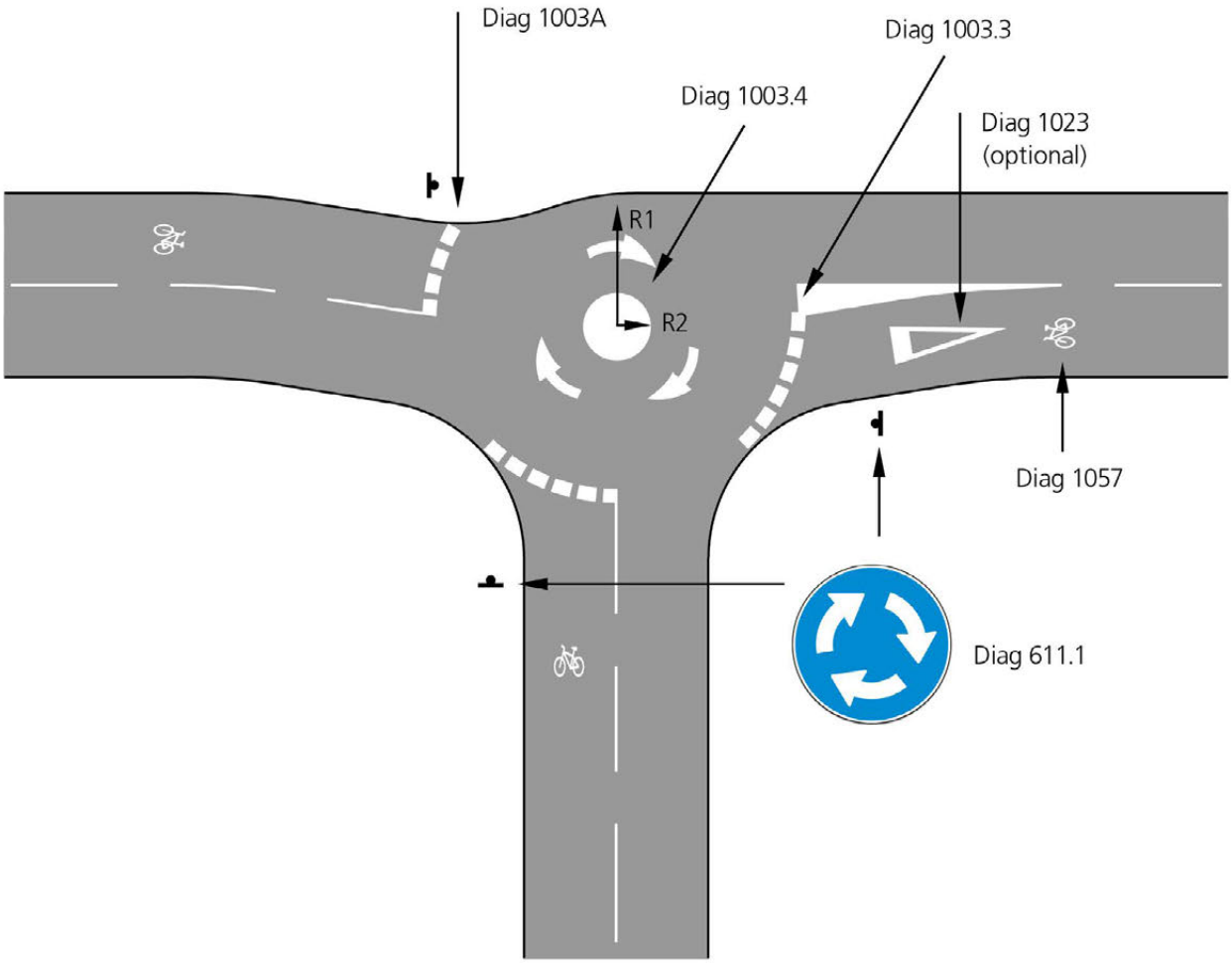
AADT:
<2500
85th percentile speed:
<22mph

Diag 602 and optional Diag 1023 where deflection on approach is limited, with Diag 1003A give way marking



Diag 611.1





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DE number: DE623 | Previous DE number: DE623

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DE624 Compact 'continental' roundabout

Measure and brief description

Based on a standard feature at junctions in Denmark and other countries, this design provides for people cycling to turn right at a multi-lane approach to a signal controlled junction, where the speed and volume of motor traffic makes the execution of a conventional right turn hazardous and unpleasant, even when an ASL is provided. Provision is made for people cycling to pull in to the side road on their left and wait there until the side road has a green light, at which point people cycling can make a straight across movement to complete their right turn (see **section 12.10**).

Benefits

- Single circulatory carriageway puts people cycling in the sight line of people driving.
- Tighter geometry at entry, circulatory carriageway and exit results in slower vehicle speeds.
- Slower speeds which aid the comfort and safety of people cycling, especially those wanting to turn right.

Key design features

- Perpendicular entry and exit arms.
- Single lane entries, circulatory carriageway and exit.
- Any cycle lanes on approaches should end 20-30m in advance of the give way line so that people cycling mix with other traffic on the junction approach.

Dimensions[56]

- R1 – Outer radius of Inscribed Circle 10m-20m.
- R2 – Radius of over-run area 6.5m-15m.
- B1 – Width of over-run area 1m-1.5m.
- B2 – Width of circulatory carriageway 4.5m-6m.
- E1 – Entry radius 12m max.
- E2 – Exit radius 15m max.

56 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

Other considerations

- Suitable for speed limits up to 40mph, although an 85th percentile of 22mph is generally safer and preferred.
- Roundabout capacity is typically around 25,000 AADT. However, table 11.1 recommends mixed traffic cycling where the 85th percentile speed and flows do not exceed 22mph and 2500 AADT (see DE625).
- Depending on layout, overall junction size and swept path requirements, it may be necessary for the roundabout to have 're-entrant' kerb lines on the outside edge of the circulatory carriageway to maintain tight entries and exits.
- Where a peripheral cycle track is appropriate, the aim should be to include cycle priority on each arm of the roundabout.
- Clutter-free (free of guard railing) median islands on the junction arms will act as refuges for the crossing movements of people walking, wheeling and cycling and improve visibility and the streetscene.
- Zebra, parallel, or uncontrolled crossings (select appropriate crossing as per table 12.1) can be placed close to the give way lines on direct desire lines.
- Adequate street lighting should be provided.

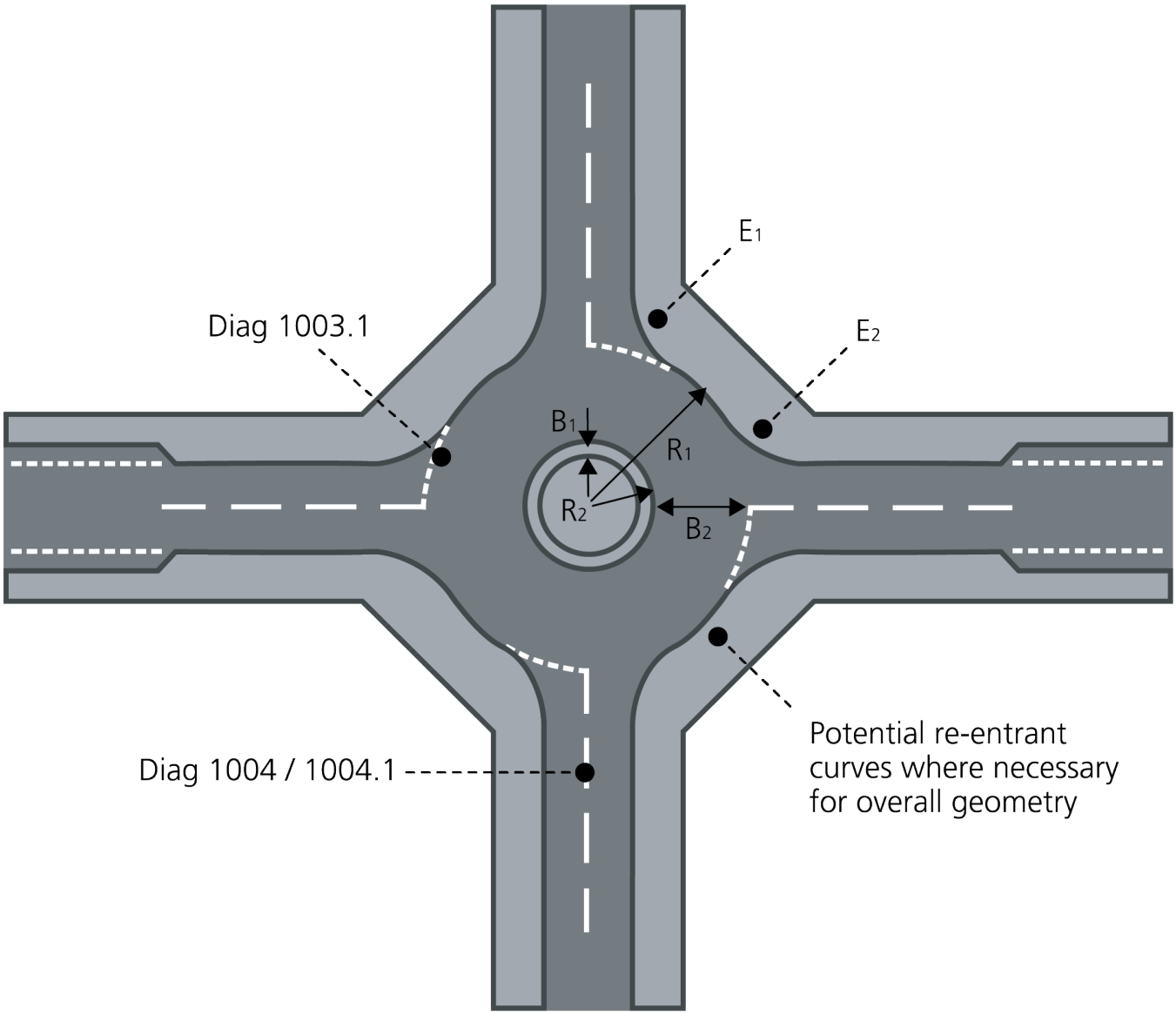
Further references

- Department for Transport – Traffic Advisory Leaflet 9/97, Cyclists at Roundabouts – Continental Design Geometry.
- Welsh Government – DMRB CD116, Geometric Design of Roundabouts.
- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- TSRGD.

DE624

Compact ‘continental’ roundabout

AADT:
<2500
85th percentile speed:
<22mph



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Welsh Government

DE number: DE624	Previous DE number: DE624
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DE625 Dutch style roundabout with cycle track priority

Measure and brief description

This roundabout is based on a design in common use in the Netherlands. It has the continental geometry with arms that are aligned in a radial pattern, with unflared, single lane entries and exits, and a single lane circulatory carriageway. This is used in combination with parallel cycle-zebra crossings of each arm, thus enabling people cycling to circulate with priority. It is suitable where speed limits are 30mph or less (see **section 12.10**).

Benefits

- People cycling not mixing with circulating motor traffic.
- Tighter geometry at entry, circulatory carriageway and exit results in slower vehicle speeds.
- Cycle priority clearly marked with parallel crossing arrangements.

Key design features

- Perpendicular entry and exit arms.
- Single lane entries, circulatory carriageway and exit.
- At least 5m setback to crossing facilities (one vehicle length).

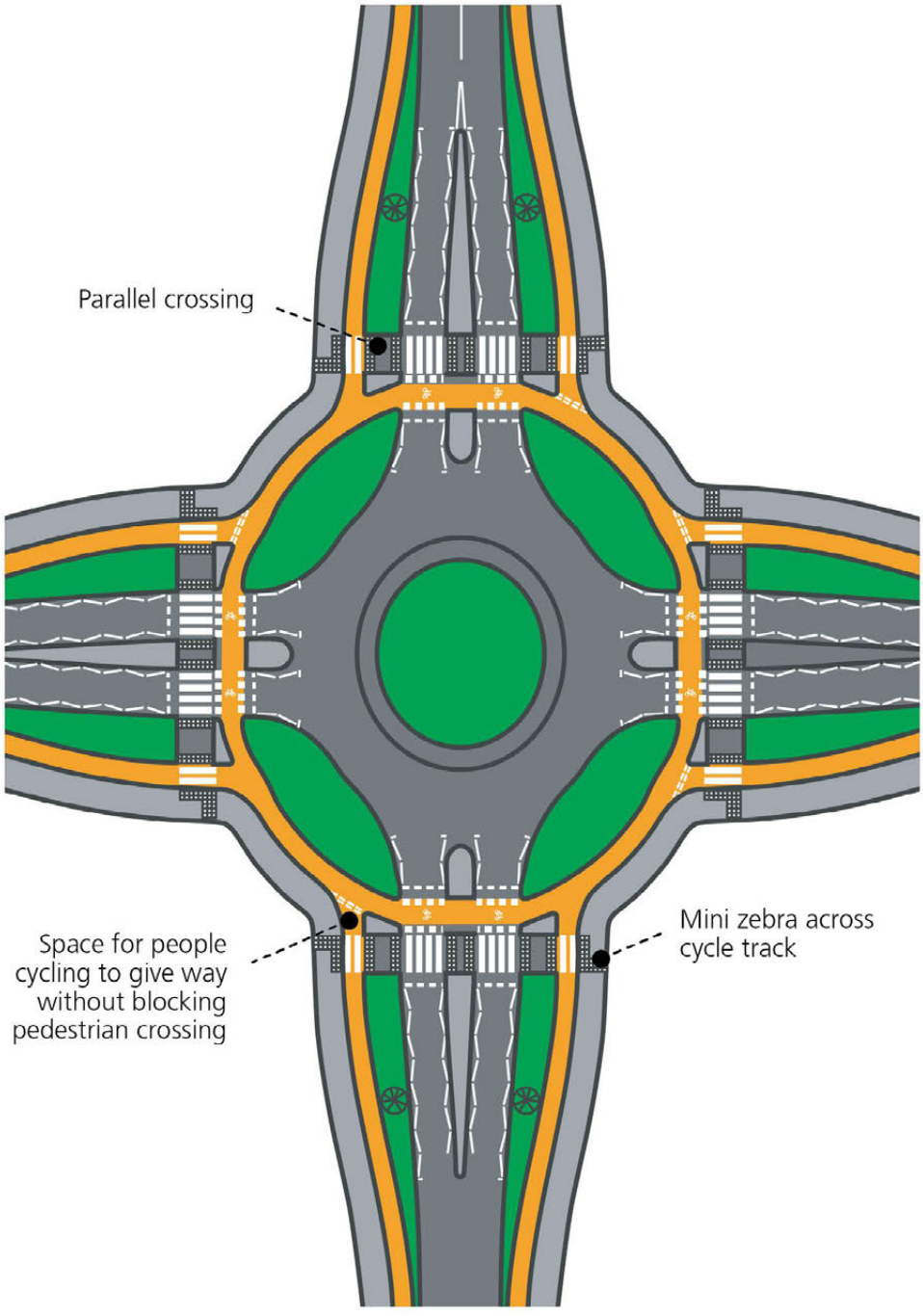
Other considerations

- Suitable for 85th percentile speeds up to 33mph.
- Chapter 11 states that above 5,000 AADT and 22mph measured 85th percentile speed a protected cycle track should be provided. 10,000 AADT is considered a critical fail using the audit tool.
- Street lighting must be provided.

Further references

- Department for Transport – Traffic Signs Manual, Chapter 6.
- Manual for Streets.
- Department for Transport – Guidance on the Use of Tactile Paving Surfaces.
- TSRGD.

DE625	Dutch style roundabout	**AADT:** Any **85th percentile speed:** <33mph



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DE626 Pedestrian/cycle bridge

Measure and brief description

Bridges provide useful connections for footpaths and cycle tracks, taking routes across severances such as major roads, railways and waterways. Where the topography is favourable the need for approach ramps can be minimised. Good natural surveillance is necessary for personal security. New bridges can be attractive features along a route. New overbridges are generally cheaper than new subways/underpasses, but may involve greater height difference to ensure clearance for large vehicles (see **section 12.11**).

Benefits

- Provides a conflict-free crossing of a major barrier.
- A new bridge may provide an opportunity for a landmark feature.
- A bridge will often be cheaper than a subway/underpass.

Key design features

- Bridges require considerable investment and should cater for people walking, wheeling, and cycling unless there are exceptional circumstances.
- For consistency, the type of infrastructure on a bridge should match that on the approach on either side, so if separated infrastructure leads up to the bridge, it should continue to be separated over the bridge deck. However, due to high costs of construction, it may be acceptable to provide a shared use path solution if user numbers can be demonstrated to be suitably low as set out in table 11.3.
- Bridge approaches and decks should be straight or nearly straight. Right angled turns are difficult for people cycling to negotiate.
- Gradients should be in accordance with the maximum values given in chapter 9, depending on the slope length. Steeper gradients than 7% are not recommended, except over very short distances (see DE103 for guidance on ramps).
- Where the topography is favourable the need for approach ramps can be minimised.
- See DE103 for Ramps, DE104 for Steps.

Dimensions[57]

- a – Overall deck width:
    - People who walk and wheel only: A minimum width of 2m, with additional width for busy routes – refer to Pedestrian Comfort Guidelines and Inclusive Mobility.
    - Unsegregated pedestrian/cycle bridge: the width should reflect the level and type of use forecast with a minimum of 4m width on primary cycle routes, or 3.5m on less busy secondary routes. On particularly heavily trafficked routes it should be increased to 5m.
- b – Segregated pedestrian/cycle bridge, footway width:
    - The width should reflect the level and type of use forecast with a minimum of 2m width, increasing to 3.5m width where there is frequent use by groups.
- c – Segregated pedestrian/cycle bridge, cycle track width:
    - Cycle track width should be sufficient to accommodate the forecast level of use with a minimum of:
        - 3.5m where the peak hour flow is less than 50/hr.
        - 4m on a primary cycle route (3.5m on a secondary cycle route) where it is 50-250/hr.
        - 4.5m over 250/hr.
- h – Parapet height
    - Parapet height for new bridges is normally 1.15m for people who walk and wheel, 1.5m for people who cycle, 1.8m for people horse riding.
    - On existing structures being converted to cycle use, this parapet height cannot always be achieved. However, this should not necessarily preclude their use as crossings for people cycling. In such cases, appropriate safety measures should be provided.

Other considerations

- Similar criteria apply to the conversion of footways over road bridges to shared use facilities. Design widths should acknowledge suppressed demand and allow for growth in user numbers.
- Exposure of users to the weather should be considered – covered bridges will be beneficial.

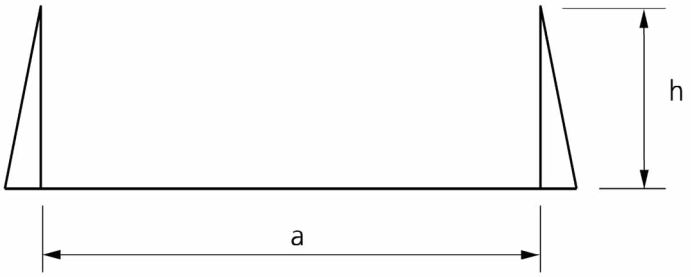
Further references

- Department for Transport – Inclusive Mobility.
- Pedestrian comfort guidelines.
- CD 353 – Design criteria for footbridges.

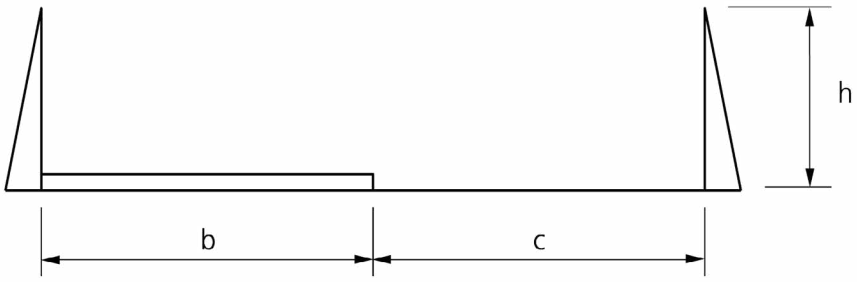
57 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE626	Pedestrian/cycle bridge	AADT: N/A 85th percentile speed: N/A

Pedestrian only or Unsegregated



Segregated



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DE627 Subway/underpass

Measure and brief description

Subways/underpasses can provide very useful connections for footpaths and cycle tracks, taking routes across barriers such as railways, waterways and major roads without conflict. Where the topography is favourable the need for approach ramps can be minimised. Achieving good natural surveillance is necessary to provide personal security. This option may involve the conversion of an existing pedestrian subway or an underpass provided for private access (see section 12.11).

Benefits

- Provides a conflict free crossing of a major barrier.
- Avoids exposure to the weather.
- The longitudinal profile of an underpass (down then up) is more comfortable for people cycling than bridges with approach ramps.

Key design features

- Subways/underpasses require considerable investment and should normally cater for people who walk, wheel and cycle.
- Subways/underpasses can attract high numbers of people who walk, wheel and cycle and the aim should be to provide effective segregation between them so that each group can travel at their preferred speed.
- Approaches and the structures themselves should be straight or nearly straight. Right angled turns are difficult for people cycling to negotiate.
- Gradients should be in accord with the maximum values given in chapter 9, depending on slope length. Steeper gradients than 7% are not recommended, except over very short distances.
- Where the topography is favourable the need for approach ramps can be minimised.
- Lighting should be provided and be vandal proof.
- Corners and recesses should be avoided, with the exits being visible to users on entry.
- Natural lighting should be maximised by the use of generous widths, angled sides to the structure and light wells on longer crossings.
- See DE103 for Ramps, DE104 for Steps.

Dimensions[58]

- Subways for people who walk and wheel require headroom (h1) of at least 2.3m (2.6m for lengths over 23m) and a width (w1) of 3m (2.3m for light use).
- Subways for use by people cycling require headroom (h1) of 2.4m (2.7m for lengths over 23m) and width (w1) of at least 4m (3m for light use) if unsegregated (see section 9.12).
- Segregated: the width for people who walk and wheel (w2) should be at least 2m, the cycle track (w3) 2.5m and the margin strip (w4) 0.5m. Headroom for people cycling (h2) and people walking and wheeling (h3) as above.
- A headroom of 3.7m is required if the route is to be used by mounted equestrians.

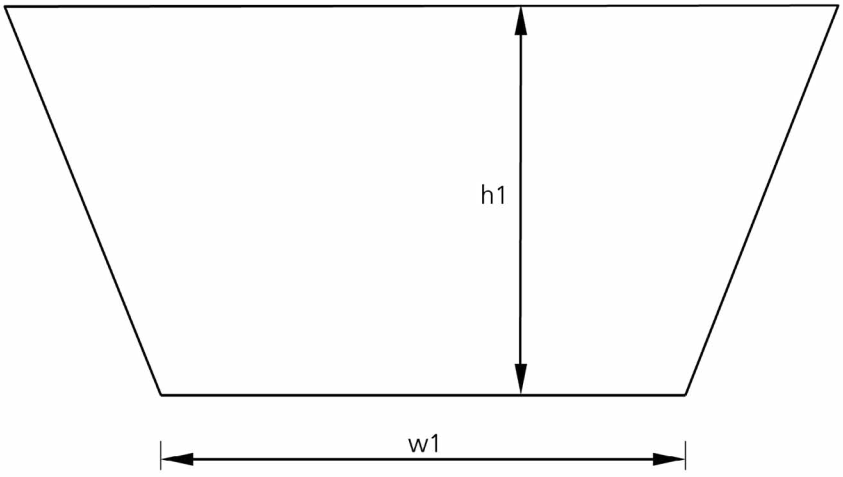
Other considerations

- The headroom in existing pedestrian subways is typically 2.3m; the slightly sub-standard height for people cycling should not lead to automatic rejection of a proposal to permit cycling. There are many examples of structures on public roads and on traffic free routes with headroom well below 2.4m, which operate without incident for people cycling. Any restricted headroom should be clearly signed. The 'cyclists dismount' sign should not be used.
- Exit must be visible on entering the subway.
- Generous headroom and width are beneficial due to better natural surveillance and personal security. Poor lighting and sightlines will offer poor personal security.
- Barriers to slow people cycling should not be used as these can restrict access for non-standard cycles.
- Lighting and natural surveillance are key in subways and underpasses so they don't exclude vulnerable people such as women and girls for safety concerns.

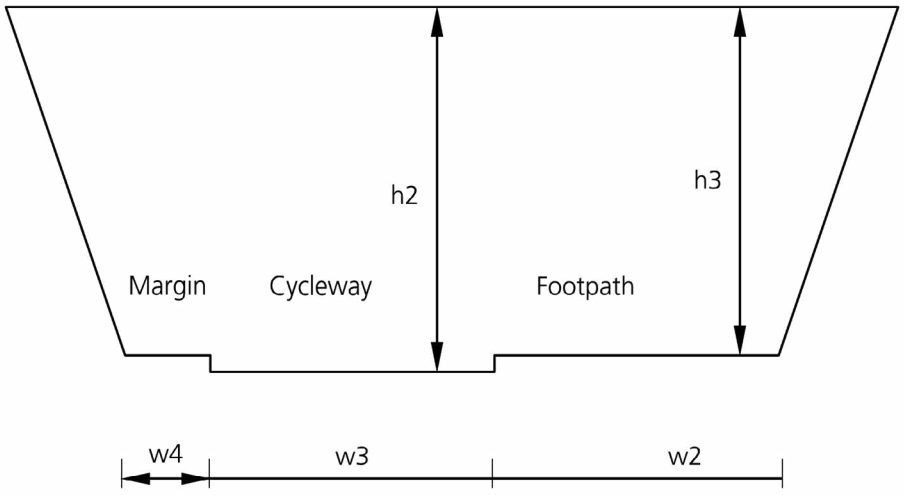
58 When designers propose a value outside the desirable limits, justification should be provided in the Design Decision Log (see appendix L).

DE627	Subway/underpass	AADT: N/A 85th percentile speed: N/A

Note:
Sloping sides preferred to increase natural light and improve personal security



Pedestrian only or Unsegregated



Segregated

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Appendix H: Audit Tools

This section provides a guide for those using the walking and wheeling, and cycling audit tools. It also gives clarification and suggests sources of information that may be useful in establishing scores, including relevant references to sections within the guidance.

Walking and wheeling route audit tool and cycling route audit tool – download audit tool.

Using the audit tools

The aim of the audit tools is to ensure a consistent approach for assessing active travel routes across Wales. The tools consider indicators contributing towards the five key principles of an active travel route (comfort, safety, directness, coherence and attractiveness).

The tools have two uses:

- To assess a proposed route.
- To assess a route design as part of a route design process. This should be carried out at each step of the design process to ensure that the final design and the constructed route reaches an 80% or above a desirable pass score.

The walking and wheeling tool is scored out of 20 indicators (with one non-scored), and the cycling tool of 25 indicators. Each indicator is scored out of a maximum of 2 points, with a maximum of 40 points available for walking and wheeling routes, and 50 available for a cycling route. These scores are then converted to percentages to establish if a route is a 'pass' or 'fail', as shown below.

Table H.1: Percentage scores and pass/fail classification

Score (%)	Pass fail
80	Pass (desirable score)
70	Pass
60-69	Fail (but may be eligible to be passed with a statement)
Below 60	Fail
Any score with a critical fail	Fail

There are 'critical' factors marked against some of the indicators, further detail on the procedures related to these factors are explained in chapter 10. In summary:

For walking and wheeling a 'critical fail' should be applied if:

- There are no dropped kerbs along a route, or if an access control is in place that does not confirm to the principles outlined in section 15.3.

For cycling a 'critical fail' should be applied if:

- The route is on-highway and vehicle flows (including percentage of HGVs) or speeds are above the threshold described in the tool, if the route is below the recommended widths for the type of infrastructure for more than 50% of the route length, or if an access control is in place that does not confirm to the principles outlined in section 15.3.

Individual scoring indicators may not apply to every active travel route, for example, indicator 7 of the walking and wheeling audit tool only relates to routes with a staggered crossing facility. Where the element is not applicable to the route, it should be marked as 'n/a' (not applicable) and the overall scoring total reduced by 2 points, as shown below.

Table H.2: Example of scoring method using walking and wheeling audit tool

Scoring consideration	Walking score example	Critical factors
Overall score	27 out of 40	0
Number of elements not applicable to the route	3	0
Total points to be reduced	6	0
Overall score (revised)	27 out of 34	0
Percentage	79% (pass)	0

An additional example using the cycle audit tool for routes away from the highway is that indicators 9-12 may not be required as the routes do not interact with vehicle traffic.

Table H.3: Example of scoring method using cycling audit tool

Scoring consideration	Cycling score example	Critical factors
Overall score	35 out of 50	0
Number of elements not applicable to the route	4	0
Total points to be reduced	8	0
Overall score (revised)	35 out of 42	0
Percentage	83% (pass – desirable)	0

Some indicators may already have useful quantitative data available from relevant local authority departments (such as previous traffic counts, speed surveys or records of highway works completed on or near a route).

Factors may also be assessed by desktop studies before undertaking the route audit, but these should be confirmed as accurate whilst undertaking the on-site audits. To qualify for inclusion on the ATNM as an existing route, an audit should have been undertaken on site.

A number of the indicators are subjective and this should be taken into consideration as part of the audit process. Regular bench-marking or feedback between auditors should take place to ensure consistency across the area.

A whole route should be part of the audit, connecting origin and destination or onward connection.

Walking and wheeling audit tool

The walking and wheeling audit tool is intended to be undertaken by an auditor who is walking or wheeling at the time of assessing the route. Assessors will need to be mindful to audit as a pedestrian under the definition of the Act (pedestrian on foot and/or with a mobility aid, such as a wheelchair or mobility scooter). Auditors should travel the route in both directions and note the time and date of the audit.

A rule of thumb to assist with the scoring for each of the subjective factors is:

- If overwhelmingly negative (0).
- If balanced (1).
- If overwhelmingly positive (2).

Table H.4: Factors to consider for walking and wheeling audit tool scoring criteria

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Attractiveness	1 – Maintenance	Examples described within tool.
	2 – Fear of crime	Are people using the route at the time of audit? Is there a mix of uses/destinations to encourage use at various times of day? Are there buildings with windows looking onto the route? Is there any evidence of anti-social behaviour?
	3 – Motor traffic noise and pollution	Is there a constant noise from various sources of heavy motor traffic? Is there traffic noise for more than 50% of the time whilst on the audit? Is there occasional traffic noise from passing vehicles?
	4 – Other	Include details of each additional indicator. Is there anything relevant to the route alignment that impacts the attractiveness of the route? (examples described within tool). For example negative factors such as poorly lit or high usage of guardrail/bollards, or positive factors such as good lighting or well-maintained planters.
Comfort	5 – Condition	Examples described within tool. Pedestrian comfort tool also useful.
	6 – Footway width	Relevant widths described within tool. Pedestrian comfort tool also useful.
	7 – Width on staggered crossings/refuges	Relevant widths described within tool. Pedestrian comfort tool also useful.
	8 – Footway parking	Examples described within tool.
	9 – Gradient	Gradient data may be available via topographical maps at desktop study stage. Mapping software tools can help to establish this.
	10 – Other	Include details of each additional indicator. Is there anything relevant to the route alignment that impacts the comfort of the route? (examples described within tool).

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Directness	11 – Footway provision	Does the footway align with the origin/destination points? Desktop mapping software can help to confirm the deviation factor or a route against the nearest straight-line alternative.
	12 – Location of crossings in relation to desire lines	Relate to origin/destination mapping in ATNM. Do the crossing points cater for these movements? Is there evidence of users crossing outside of these facilities whilst on the audit?
	13 – Gaps in traffic	Not applicable if crossings on desire lines accommodated for via controlled facilities (see factor 14/15). Can be established on-site using a stopwatch (consider time of day and route context).
	14 – Impact of controlled crossings	Not applicable if no controlled crossings (see factor 13). Island waiting time can be established on-site using a stopwatch (consider time of day and route context).
	15 – Green signal time	Not applicable if no signal-controlled crossings (see factors 13/14).
	16 – Other	Include details of each additional indicator. Is there anything relevant to the route alignment that impacts the directness of the route? (examples described within tool).
Safety	17 – Motor traffic volume	Check by desktop study; traffic counts/flows may have been conducted previously along route section by local authority, or by external company, for example, as part of a development's access/egress statement. Can be confirmed on site. Alternatively, an on-site cordon count can be undertaken (consider context of route and time/day).
	18 – Motor traffic speed	Should be based upon actual speeds, rather than stated limit along the route. Check by desktop study, traffic counts/flows may have been conducted previously along route section by local authority, or by external company, for example, as part of a development's access/egress statement.
	19 – Visibility	Street furniture should contrast with background materials to increase visibility (consider daylight and darkness). There should also be good intervisibility between other users.

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Coherence	20 – Dropped kerb and tactile paving	Are the tactiles provided in line with recommendations, for example correct markings, opposite one another? **Critical factor:** would this route be accessible to a wheelchair user/mobility scooter user?
	21 – Signage	Not a scored factor, but will need to be proportionate to route context, for example, local residential may require a different approach.

Cycling audit tool

As with the walking and wheeling audit tool, assessors will need to undertake the audit as a cyclist under the definition of the Act (users of pedal cycles, but not motorbikes, including e-cycles), including a consideration of the dimensions of adapted cycles. It is advised that auditors should cycle the route to get a feel for the route as a person cycling, before travelling the route by walking or wheeling to annotate the audit form. If proposed as a bi-directional alignment, auditors should travel the route in both directions. Auditors should note the time/date of the assessment.

A rule of thumb to assist with the scoring for each of the subjective factors is:

- If overwhelmingly negative (0).
- If balanced (1).
- If overwhelmingly positive (2).

Note: When using the cycle audit tool on less busy secondary or local routes, if a route was built in line with the Active Travel Act Guidance that was applicable at the time, and there are no known issues, then a route should not fail based on the factor ‘effective width without conflict. Issues to consider are the volume of cyclists using or expected to use the route, route type and the volume of, and impact on, people walking or wheeling.

Table H.5: Factors to consider for cycling audit tool scoring criteria

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Cohesion	Connections.	An overview map, showing the context of the area, may help to understand likely route connections from the alignment being audited. Consider if turning/connected facilities suitable for people cycling.
	Continuity/ wayfinding.	Examples provided within description, look out for advisory dismount signage and if markings are provided where confusion as to alignment may arise, for example through junctions.
	Density of network.	Establish using desktop study before or after the audit takes place (confirming accuracy whilst on site).

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Directness	Distance.	As above.
	Time: frequency of required stops or give ways.	To confirm locations of stops or give ways along route on site visit, can be calculated via desktop measurement tools in relation to the length of route.
	Time: delay at junctions.	To confirm delay of timings whilst on route, auditors can time the lights and movements across the junction with stop-watch (provided there is a safe location to start/stop timing).
	Time: delay on links.	To confirm whilst on audit. Consider ability to pass queued traffic, for example.
	Gradients.	Gradients can be considered by desktop study and confirmed on site. Should be considered in both directions if bi-directional route.

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Safety	Reduce/remove speed differences where people cycling are sharing the carriageway (junction).	May not apply to some motor traffic-free routes, but will be relevant where people cycling are required to cross at a junction. Should be based upon actual speeds, rather than stated limit along the route. Check by desktop study, traffic counts/flows may have been conducted previously along route section by the local authority, or by external company.
	Avoid high motor traffic volumes where people cycling are sharing the carriageway (route).	As above, but refers to speeds along the alignment rather than at junctions/crossings.
	Risk of collision (route).	Check by desktop study, traffic counts/flows may have been conducted previously along route section by local authority, or by external company, for example as part of a development's access/egress statement. Can be confirmed on site. Collision data may be useful to evidence.
	Risk of collision (junction).	Confirm whilst on audit the provision for people cycling at junctions, including side roads. Are vehicle speeds reduced through the junction via mitigation methods (for example traffic calming or reduced corner radii)? Are cycle movements separated from motor vehicle movements through major junctions? Collision data may be useful as evidence.
	Avoid complex design.	Are the road markings in place sufficient to illustrate potential movements, are the markings faded or worn? Are there complex or unusual movements associated with negotiating the route or junction?
	Consider and reduce risk from kerbside activity.	Are cycle lane widths less than 1.5m (including buffers for parking/loading)? Do cycle lanes adjacent to parking bays allow enough room for manoeuvre from a car door if opened? Are there features along the route that people cycling may become trapped against (such as guardrails)?
	Reduce severity of collisions where they do occur.	Are there any features adjacent to the route that would not allow a person cycling to take evasive action (for example wall directly adjacent to a minimum recommended width route)? If so, consider the score against the length of the route section this applies to.

Principle	Factors	Things to look out for/useful sources (as well as engagement/consultation feedback)
Comfort	Surface quality (defects).	Descriptions within audit tool.
	Surface quality (type).	Descriptions within audit tool.
	Effective width (without conflict).	Consider the route, and type of provision, against the minimum desirable values. May need to assess flows to ensure widths provided are sufficient for the route's context.
	Wayfinding.	This element relates only to the provision of signage relevant to the route and whether this is of high quality (signage clutter is considered separately within the Attractiveness principle).
Attractiveness	Social safety and perceived vulnerability of user (lighting).	Ideally, particularly if a route is likely to be used often at night, a route should be audited in both daylight and at night. If an audit is only undertaken during the day, check if lighting columns/posts/in-ground are provided.
	Social safety and perceived vulnerability of user (isolation).	Are people using the route at the time of audit? Are there a mix of uses/destinations to encourage use at various times of day? Are there buildings with windows looking onto the route? Is there any evidence of anti-social behaviour?
	Impact on people walking or wheeling, including people with disabilities.	Is there evidence of conflict, or high potential for conflict between people walking, wheeling and people cycling? If also a pedestrian alignment, refer to walking and wheeling audit findings relating to the comfort guidance tool.
	Minimise street clutter.	This relates to signage along the route, not necessarily relating to cycle-specific signs. The main query relates to if the signage needed by a person cycling is clear, or if it is difficult to identify against signage clutter (for example other directional signage, redundant, out of date or overbearing signage, inappropriately placed advertising signage).
	Secure cycle parking.	Consider cycle parking stand usage whilst on audit (if applicable).

Appendix I: Main legal frameworks for the construction and maintenance of active travel routes and facilities

Introduction

Legal procedures

The diagram below sets out the main legal frameworks for the construction and maintenance of active travel routes and facilities in addition to the Active Travel Act.

Table I.1: Main legal frameworks for the construction and maintenance of active travel routes and facilities (in addition to the Active Travel Act)

Highways Act 1980	Road Traffic Regulation Act 1984	Cycle Tracks Act 1984	Town and Country Planning Act 1990
S.24 Construction of New Highways	S.1-5 Traffic regulation orders. • prohibitions of traffic or classes there of. • mandatory cycle lanes. • bus lanes. • one way streets. • prohibited and prescribed manoeuvres. • contra-flow bus lanes and bus gates. • prohibitions of waiting stopping and loading.	S.3 Conversion of footpaths to cycle tracks.	S.249 Pedestrian streets. Where not enacted under the Road Traffic Regulation Act 1984.
S.41 Maintenance of Highways	S.23-25 Pedestrian crossings. • zebra crossings. • NOT toucan crossings.	S.4 Provisions of barriers etc. in cycle tracks. Access control on cycle tracks.	Blank cell.

Highways Act 1980	Road Traffic Regulation Act 1984	Cycle Tracks Act 1984	Town and Country Planning Act 1990
S.65 – Construction of cycle tracks adjacent to carriageways	S.32-63A Parking places. • cycle parking. • other parking and loading places.	Blank cell.	Blank cell.
S.90A-90F Road humps	S.64-80 Traffic signs. • Also toucan crossings and traffic signals.	Blank cell.	Blank cell.
S.90G-90I Other traffic calming; Traffic Calming, Hybrid Mandatory, Cycle Lanes, Bicycle Streets	S.81-91 Speed limits.	Blank cell.	Blank cell.
S.97 Lighting	S.92-93 Bollards. • Access control.	Blank cell.	Blank cell.

Highways Act 1980

Section 62 – General Improvements: The provisions of this part of this Act empower or require highway authorities and other persons to improve highways. Any such authority may carry out, in relation to a highway maintainable at the public expense by them, any work (including the provision of equipment) for the improvement of the highway. Section 62 covers any of the following descriptions:

- the division of carriageways, provision of roundabouts and variation of the relative widths of carriageways and footways.
- the construction of cycle tracks.
- the provision of subways, refuges, pillars, walls, barriers, rails, fences or posts for the use or protection of persons using a highway.
- the construction and reconstruction of bridges and alteration of level of highways.
- the planting of trees, shrubs and other vegetation and laying out of grass verges.
- the provision, maintenance, alteration, improvement or other dealing with cattle-grids, bypasses, gates and other works for use in connection with cattle-grids.
- the construction, maintenance and removal of road humps.
- the construction and removal of such traffic calming works as may be specially authorised by the Secretary of State under section 90G below or prescribed by regulations made by them under section 90H below.

- the execution of works for the purpose of draining a highway or of otherwise preventing surface water from flowing on to it.
- the provision of barriers or other works for the purpose of affording to a highway protection against hazards of nature.
- A highway authority may alter or remove any works executed by them under this section. Section 65 – Construction of cycle tracks adjacent to carriageways: Empowers highway authorities to provide cycle tracks within or next to highways including a carriageway (such as a street). This is not suitable for footpaths (where the only right of way across the entire width of the highway is by foot). There are no statutory requirements regarding the exercise of this power, although there needs to be evidence that the highway authority has exercised this power, particularly given such schemes may be contentious. The erection of the appropriate traffic signing will perform this role to an extent, though it is recommended that any conversion is formally made by a resolution of the relevant council committee, following consultation and engagement with stakeholders.

Where a cycle track is proposed adjacent to a highway, but outside its adopted limits, this can be achieved by constructing a cycle track under section 65(1) of the Highways Act as a permitted development under Part 13 of Schedule 2 of the Town and Country Planning (General Permitted Development) Order 1995 (HMSO, 1995).

Sections 90A-90F (Road humps) allows highway authorities to construct road humps. Their design and installation is regulated by the Highways (Road Humps) Regulations 1999 (HMSO, 1999b). Advice relating to good practice and legal requirements with respect to de-sign can be found in Section 4 of LTN 1/07 Traffic Calming (Department for Transport, 2007a).

Section 90C (1) of the Highways Act 1980 requires that the Chief Officer of Police is consulted before road humps are installed. Sections 90C (2) and (5) of the same Act require authorities carry out the following procedure before installing road humps:

- notices should be placed in local press and on-street, detailing each individual road hump proposed and inviting objections before a stated deadline not less than 21 days after the publication of proposals.
- any objections received should be considered by the highway authority. Typically objections will be considered by the relevant committee of the Council.

Regulation 3 of the Highways (Road Humps) Regulations 1999 requires that the following bodies are consulted in addition to those above:

- the Chief Officer of the fire brigade.
- the Chief Officer of any body providing ambulance services.
- any organisations appearing to the authority to represent persons who use the highway to which the proposal relates, or to represent persons who are otherwise likely to be affected by the road hump.

Section 90G-90I (Other traffic calming) allows highway authorities to construct other traffic calming measures. These measures are regulated by the Highways (Traffic Calming) Regulations 1999 (HMSO, 1999a), which permit the following measures:

- build-outs.
- chicanes.
- gateways.
- islands.
- over-run areas.
- pinch points.
- rumble devices.
- combinations of the above.

The regulations impose limits on the design of over-run areas and rumble devices. Section 5 of LTN 1/07 Traffic Calming (Department for Transport, 2007a) offers design advice – additional care should be taken to ensure such features do not pose a hazard to cyclists.

Section 97 (Lighting) empowers highway authorities to provide lighting on highways, including cycle tracks. There is no prescribed procedure for providing such lighting.

Appendix J: Network planning background information

Successful integration with other policies, plans and programmes will deliver better active travel schemes more quickly. These plans might include:

- Transport and land use plans:
    - existing walking, wheeling, cycling or active travel strategies and plans.
    - Local/Regional Transport Plans (RTPs) or Regional Transport Delivery Plans (RTDPs).
    - Local Development Plans/Strategic Development Plans (LDPs/SDPs).
    - plans or proposals for the development of non-vehicular routes, quiet lanes, home zones or traffic calming.
    - strategic bus plans or schemes.
    - rights of way improvement plans.
    - traffic management plans.
    - city centre management plans.
    - any Network Rail or Transport for Wales plans such as new stations, station improvements or changes to bridges or level crossings.

- Road safety strategies and schemes:
    - School based regional transport schemes.
    - plans and strategies by third parties that include infrastructure provision for active travel.
    - local development plans (including supplementary planning guidance and masterplans).
    - Wales Transport Strategy.
    - highway maintenance plans.
    - any plans for new highways (for example linking to new development sites).

- Other local authority plans, strategies, and service area programmes that could include:
    - schools.
    - tourism.
    - countryside.
    - public rights of way.
    - highway maintenance.
    - access officers.
    - economic development or regeneration.
    - health and well-being plans.

Integration with policy and promotion measures

The plans also need to be integrated within a wider programme of measures to improve facilities for active travel. The following should be considered in conjunction with any walking, wheeling and/or cycling improvement schemes:

- ensure that planning policy guides new development towards sustainable locations that maximise the potential for trips to be made by people walking, wheeling or cycling.
- ensure that transport policy and highway development control processes result in new development site layouts that are designed to maximise access by people walking, wheeling or cycling.
- ensure that the needs of people walking, wheeling and cycling are considered when implementing any changes to highway infrastructure.
- encourage travel plans, which provide a strategy and action plan for facilitating and encouraging travel by sustainable modes, from all significant developments through the planning process.
- explore the potential for new larger-scale developments to fund walking, wheeling and cycling audits within adjacent neighbourhoods, potentially secured through section 106 agreements.
- promotion of active travel measures such as:
    - production and dissemination of public walking, wheeling and cycling maps, which should also provide information on public transport.
    - organised activities for specific user groups, such as ‘walk/wheel/cycle to school month’.
    - dissemination of publicity regarding the potential health and financial benefits of regular walking, wheeling and/or cycling.
- work with partners in the health sector to develop walking, wheeling and cycling-based initiatives to help meet shared objectives for active travel. This could contribute to delivery of objectives identified in Local Well-Being Plans.
- work with partners in the air quality sector to promote active travel as a way of reducing or limiting air pollution to help meet shared objectives for active travel.
- for further information and guidance please use the Active travel promotional toolkit.

National data sources for network planning

There is a broad range of publicly available data which can usefully input into the development of an Active Travel Network Map (ATNM), including:

- ward boundary map.
- census – ward-to-ward travel to work data by mode.
- NOMIS ward-to-ward travel to work patterns.
- demographic profile maps.
- residential and workplace population data.

- cycling to work data.
- cycle collision data.
- road network hierarchy.
- Department for Transport – traffic counts Wales.
- traffic (all modes) count location plan.
- traffic (all modes) flow data.
- Welsh Index of Multiple Deprivation.

Local data sources for network planning

Local authorities already collect a range of data which can usefully input into the walking, wheeling and cycle network plan including:

- locally collected traffic, walking, wheeling and cycle count location plan.
- locally collected traffic, walking, wheeling and cycle flow data including off road cycle counters.
- locally collected traffic speed data.
- data collected as part of travel plans for specific organisations within the settlement.
- existing traffic calmed streets.

Origins and destinations to be mapped in the Active Travel Act

For the Active Travel Act the following departure and destination points need to be mapped as part of the production of the ATNM:

- major office locations, employment sites and business parks.
- public transport nodes.
- libraries.
- post offices.
- sports stadia.
- leisure centres.
- parks.
- religious buildings.
- hospitals.
- shopping centres and major retail destinations.
- all schools and educational establishments.
- cultural institutions.
- tourist advice centres.
- tourist and leisure attractions.

- recreational walking, wheeling and cycling routes.
- cycle maintenance and repair shops.

Table J.1: Data sources and tools to assist in prioritisation

Service/data	Purpose
PCT (National Propensity to Cycle Tool – Free web tool)	Estimates cycling potential based on existing levels and demographic data.
sDNA (Spatial Design Network Analysis – Cardiff University)	Visualises current flows of people cycling, identifies accessibility issues and predicts future new route usage.
Data Shine (UCL – Free web based)	Displays how many people travelled by walking, wheeling or cycling between various urban zones to show where the biggest demand is.
Strava Metro network usage data (Strava)	Uses crowd-sourced cycling usage data to show how people navigate through geographic areas.
Transport for Wales Active Travel Prioritisation Tool	The tool is available for use by local authorities and provides an objective, evidence-based assessment of the relative priority of routes relating to their potential impact on modal shift.

Appendix K: Example prioritisation process

The scoring matrix included below was developed from the approach used by Bridgend County Borough Council during the prioritisation of its previous active travel proposals. It was originally adapted from a matrix developed by Local Transport Projects Limited and has been used in the Cardiff Strategic Cycle Network Plan. The tool was also used previously by the south-east Wales Active Travel group as the basis for its RTP active travel scheme prioritisation process.

The matrix contains 26 separate scoring elements, related to the benefits and accessibility improvements which it is anticipated that schemes will deliver. It is intended that the matrix will provide a mechanism to assist local authorities to identify which schemes are likely to have the greatest impact, and therefore should be prioritised for development and delivery.

When scoring the schemes, the route should be assessed in terms of its potential to cater for a whole journey, particularly in terms of linking to services and facilities. Details of the criteria that should be used as the basis for scoring each element of the matrix are included in the tables.

Table K1: Example prioritisation factors matrix.

Table K2: Example prioritisation scoring matrix.

Table K3: Benefits scoring system.

Active travel guidance: prioritisation example templates to download:
https://gov.wales/active-travel-guidance-prioritisation-matrix-appendix-k

Transport for Wales have also developed a prioritisation tool based on the factors contained within the prioritisation matrix.

This tool is available for use by local authorities and provides an objective, evidence-based assessment of the relative priority of routes relating to their potential impact on modal shift.

The outputs of the tool indicate whether a route falls within one of five categories ranging from “Very High Impact” to “Very Low Impact”.

Local authorities and Corporate Joint Committees (CJCs) should take account of the outputs from the tool when developing their programmes.

Programmes should prioritise schemes identified as having the potential to achieve “Very High Impact” or “High Impact” unless sufficient reasoned justification can be provided.

Further details of the tool can be provided by Transport for Wales.

Figure K.1: Example Prioritisation Factors Matrix

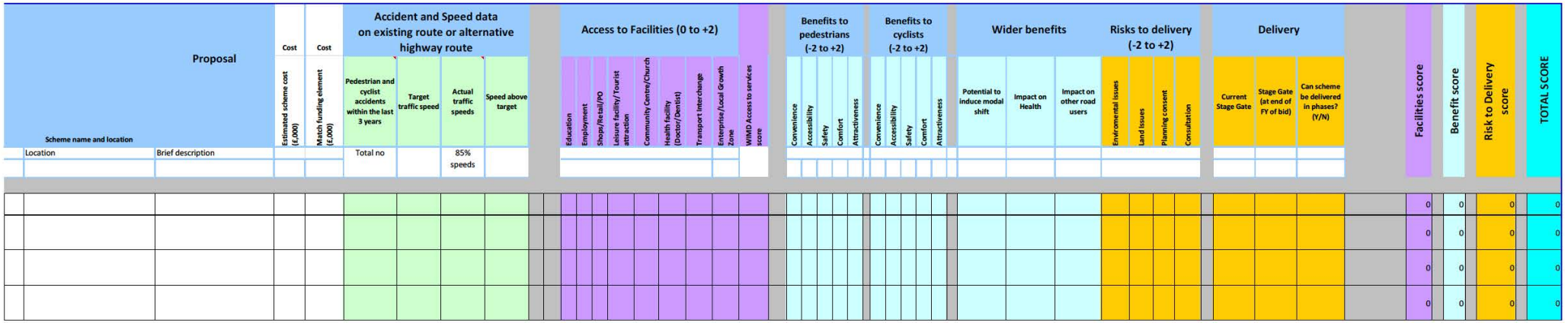


Table K.1: Example Prioritisation Scoring Matrix (Access to Facilities)

Priority	Access to education, employment and key services (each type scored separately on assessment form)	Access to major transport interchanges (bus/train stations)	Population affected by route proposals
2	Route provides a continuous link to trip attractors within 400m of route.	Route provides a continuous link to public transport interchanges within 400m of route.	High population within 200m of the route proposals.
1	Route provides a continuous link to trip attractors within 800m of route.	Route provides a continuous link to trip attractors within 800m of route.	Medium population within 400m of the route proposals.
0	Route provides a continuous link to trip attractors more than 800m away from route.	Route provides a continuous link to trip attractors more than 800m away from route.	Low population within 800m of the route proposals.
-1	Unlikely to occur in practice.	Unlikely to occur in practice.	Unlikely to occur in practice.
-2	Unlikely to occur in practice.	Unlikely to occur in practice.	Unlikely to occur in practice.

Table K.2: Example Prioritisation Scoring Matrix (Risks to Delivery)

Priority	Environmental/ecology issues	Land issues	Planning consent	Consultation
2	No environmental/ecological issues or issues resolved.	No land issues or land in ownership of local authority.	Planning consent not required or planning consent granted with no conditions.	Consultation and engagement completed.
1	Environmental issues identified and resolution programmed/arranged.	Land owned by 3rd party but lease/other arrangements in place.	Planning consent granted but with conditions.	Consultation required and programmed. Scheme unlikely to be contentious.
0	Environmental/ecological issues identified.	Scheme requires 3rd party land and landowner identified and discussions ongoing.	Planning consent required – planning application submitted.	Consultation required and programmed but scheme likely to be contentious or not programmed and unlikely to be contentious.
-1	Environmental/ecological issues unknown.	3rd party land required and landowner identified but no contact established.	Planning consent required – no application submitted.	Consultation required and not programmed. Scheme likely to be contentious.
-2	n/a.	Scheme requires 3rd party land but landowner unknown.	Planning consent rejected.	n/a.

Table K.3: Example Benefits Scoring System

Priority	Convenience	Accessibility	Safety	Comfort	Attractiveness	Impact on other road users	Priority	Potential to induce modal shift
2	• Route is direct for journeys for which it is expected to cater. • Route is essentially level. • Route contains few points of delay and/ or avoids existing delays.	Provides significantly improved link: • along identified desire line. • to key trip generator(s). • between two existing links. • across existing severance. Proposal also readily accessible from all streets and premises.	Addresses significant recorded collision history (4 in 3 yrs, or 2 KSI in 3 yrs suggested).	Significantly improves comfort (for example, provides complete segregation from traffic with buffer, a well overlooked route, minimal traffic speeds etc.).	Proposals significantly improve the environment for cycling/ pedestrians in terms of aesthetics, noise, and quality of public space.	Unlikely to occur in practice.	5	Likely to result in significant modal shift from private car to pedal cycle/ foot either as a result of the physical connection or route being within an area benefitting from an on-going behaviour change programme for example, Smarter Choices/Bike It.

Priority	Convenience	Accessibility	Safety	Comfort	Attractiveness	Impact on other road users	Priority	Potential to induce modal shift
1	Route reasonably direct for journeys for which it is expected to cater. • Route includes only moderate gradients. • Route contains some points of delay and/ or reduces existing delays.	Provides improved links: • along identified desire line. • to key trip generator(s). • between two existing links. • across existing severance. May also improve slightly accessibility to other streets and premises.	Addresses lesser recorded collision history, or location understood to have a collision history which is not fully recorded.	Improves comfort (such as provides some segregation from traffic, traffic speeds below 20mph without segregation, personal safety improvements such as CCTV and lighting etc.).	Proposals slightly improve the environment for cycling/ walking in terms of aesthetics, noise, and quality of public space.	Provides some additional benefit to other road users on balance (as a toucan might for pedestrians).	3	May increase numbers of cyclists/ pedestrians but unlikely to result in significant modal shift from private cars either as a result of physical works or the route connecting to an area benefitting from a behaviour change programme.

Priority	Convenience	Accessibility	Safety	Comfort	Attractiveness	Impact on other road users	Priority	Potential to induce modal shift
0	• Proposals do not offer greater convenience than existing situation.	Proposals do not improve accessibility.	No expected impact on collisions.	No expected improvement in terms of comfort.	Proposals have little or no benefit on quality of environment for cycling/ walking in terms of aesthetics, noise, and quality of public space.	No significant expected impact for other road users.	0	Little or no modal shift expected and scheme not linked to behaviour change programme.
-1	• Proposal requires less direct route than existing. • Route introduces points of delay.	Unlikely to occur in practice.	Proposals may result in additional collisions.	May reduce level of comfort for cyclists/ pedestrians.	Proposals degrade quality of environment for cycling/ walking in terms of aesthetics, noise, and quality of public space.	Some significant negative impact expected for other road users (such as loss of residential parking, some additional congestion.	-1	Unlikely to occur in practice.

Priority	Convenience	Accessibility	Safety	Comfort	Attractiveness	Impact on other road users	Priority	Potential to induce modal shift
-2	Unlikely to occur in practice.	Unlikely to occur in practice.	Unlikely to occur in practice.	Unlikely to occur in practice.	Unlikely to occur in practice.	Very significant negative impact expected for other road users (such as serious congestion, especially for PT, loss of parking in retail areas, restrictions on loading).	-2	Unlikely to occur in practice.

Appendix L: Design Decision Log (DDL)

This section provides an overview on how to log the Design Decisions which shaped the design and to record the decisions made throughout the project. Providing this log to accompany the plans and supporting documentation is essential to keep an audit trail and to assess the impact of a project.

Download Design Decision Log.

Aim

The aim of the Design Decision Log (DDL) is to provide an audit trail and create a record of the decisions and assumptions the project team have made through all the stages of the project. As a best practice, DDL should be used for all infrastructure projects. This ranges from the pre-design phase, where routes and surveys or initial investigations are being carried out, down to the construction phase, where designs might have to be changed due to unforeseen circumstances.

Recording the decisions of a project helps colleagues, delivery partners and stakeholders to understand the rationale of the design and to justify why the solutions presented are the best option for that project.

What to log?

All decisions that contributed to shape the project should be logged, such as decisions based on traffic, surveys on people walking, wheeling and cycling, ground investigation, points of interest, land borders, constraints, topography and local characteristics, for example.

As well as the design decisions that have been made around the project that meet the Active Travel Act Guidance (ATAG) standards, if a decision is not in line with the ATAG recommendation or desirable values, it should be recorded with an appropriate level of information to justify the reason.

All projects should strive for full compliance with best practice and the ATAG design standards. It is recognised that physical constraints over a short segment of the route, for example, might be unavoidable but may not exclude the route, as long as the proposal passes the ATAG audit (see appendix H).

Some local authorities may have existing audit trail processes in place for recording the development and design decisions which may be suitable as an alternative to the DDL, if similar levels of information to the DDL are included. The DDL does not replace the EqIA.

How to use the Design Decision Log?

Log in the form every decision or assumption that impacts that project, as well as all variations from recommendations or desirable values advised in the guidance documents.

The impact of a Design Decision from the prescribed standards and guidance will be evaluated in relation to the overall scheme objectives and be checked to ensure that the scheme still delivers the intended outcome.

A Design Decision relates to a choice or assumption agreed during the design and or a variation from a guidance document (ATAG, Guidance on the use of tactile paving, inclusive mobility, etc.). A Departure relates to a variation from standard documents such as Design Manual for Roads and Bridges (DMRB) suite or regulatory documents such as Traffic Signs Regulations and General Directions (TSRGD), which have their own formal processes in place with the Welsh Government (Please refer to section 7.4 and Departures from Standards).

A Departure may be logged in the Design Decision Log form to track all the events informing the design, but this does not replace the formal process already in place which must be followed.

Any design decisions that do not meet the ATAG requirements should be reviewed by an impartial third party with ATAG knowledge and experience (such as Welsh Government or Transport for Wales) so as to provide oversight and reassurance to the project team and key stakeholders that the decision is justified.

Where a Design Decision (or formal departure) is likely to have a significant impact on a particular group of people, then early engagement with that group is advised.

An example of a Design Decision Log is provided below and an editable version for download can be found via the link above.

Design decision log

Local Authority: N/A
Project name: Example

Figure L.1: Example on how to fill in the Design Decision Log

ID	Description of the decision & example image (if applicable)	Location & Reference drawings	Description of the rationale behind decision	Impact of the decision on the project	Aggravating or mitigating local factors	Length / number of occurrences	Percentage of the scheme impacted by decision	Alternative options considered and reasons for exclusion	Justification of design choice	Does the decision consider the results of the Equality Impact Assessment?	Additional mitigations & enhancements	Impact of the decision on safety	Is it a Departure?	Design guidance referenced	Decision by	Discipline	Date of decision
Example 001	Segregated two way Cycletrack with between 50 and 250 peak hour cycle flow. Width is 3.2m except under old bridge, where width is reduced to 2.6m. Guidance recomends desirable minimum width of 3.0m.	Drawing 100.01	The presence of the structural elements of the bridge reduce the available width, which doesn't allow for more space available for the cycleway.	This will impact people with less confidence cycling as they might feel unconfortable cycling close to other people in a narrower space. It will impact people cycling on bikes with trailers or wider bikes (trikes, etc). It will have an impact on the speed of all people cycling as they will have to slow down on the narrowing. Not a critical fail. Will lower the score 1 point on the comfort.	This is a busy route as is the main access to the train station and connects to cycleway A and C. There is good visibility on this section of the route.	1 occurrence for a length of 9 metres.	16%	Narrowing the carriageway: The carriageway is already narrowed to the minimum width for a bus route. Structural changes to the bridge: The bridge is historical and in use by rail so changes would have significant disruption and cost which would make the scheme unfeasible. Narrowing the footway: This is a busy pedestrian route due to the proximity to the train station.	Although the design impacts people cycling, this is only for a small fraction of the route. People wheeling , walking or using the bus won't be impacted.	Yes, pedestrian routes are not impacted, there are impacts on some larger adapted cycles, but these are mitigated by the ARAF/SLOW marks, and the good visibility which will allow cyclists to make room for each other.	The carriagway was converted in one way to provide space for the segregated cycleway. ARAF/SLOW marks will be added on each lane of the cyclepath.	There is some residual risk which is low due to the good visibility and the ARAF/SLOW markings	No	ATAG. Table 9.8	TG	Highways & Streets	10/03/2025
Example 002	A 3.5m shared use path was proposed in the scheme between point A and B, instead of a separated cycletrack.	Drawing 100	Between location A and B, a path by a 40mph trunk road, the flow of people walking, wheeling is very low and the flow of people cycling is low (less than 100 total users per day). In this area the space available is narrow and a verge in between the active travel infrastructure is required due to speed.	This can impact people with visual or hearing impairments that might feel unsafe walking or wheeling in the same space as people cycling. Can also impact people walking with children that might feel unsafe.	The shared use path proposed is 3.5m. Good visibility. No schools or care homes in the vicinity. Due to the distance and this being a route connecting two towns, without any services/businesses along this section, mostly cycles/e-cycles use this part of the route and pedestrians are very infrequent.	1 occurrence for a length of 2km	30%	Narrowing the carriageway: already at a minimum width. Reducing the verge: would have impact on all users and feel unsafe. Alternative routes: longer and with more constraints.	The low flows in this section of the scheme make this option viable.	Yes, there are some impacts as users can feel unsafe and uncomfortable in a shared use space. The width, good visibility, and the fact mostly cycles and e-cycles use this route due to being distant, reduces the impact significantly.	Signage and tactile paving warning users it is a shared use area. Illumination of the route to increase intervisibility at all times.	There is some residual risk which is low due to the good visibility, width and illumination.	No	ATAG Table 11.5	SR	Highways & Streets	12/04/2025

Appendix M: ATNM link selector supporting information

This appendix provides support of the use of the ATNM link selector in **figure 11.1**. The first section (**M1**) aims to provide a written explanation of all the possible steps and paths within the link selector.

The second section (**M2**) provides support local authorities to determine what percentage of the route us covered by developed frontages.

Section M1: ATNM text explanation

Step 1: Is the proposed link on or directly adjacent to a carriageway?

If the link is directly adjacent to a carriageway, go to Step 2A.

If the link is not on or directly adjacent to a carriageway, go to Step 2B.

Step 2A: Links on or directly adjacent to a carriageway

Assess:

- Motor vehicle flows (AADT).
- Motor vehicle speeds (85th percentile).

If more than 2,500 AADT OR 85th percentile speed above 22 mph, proceed to Step 3, street classification assessment.

If less than 2,500 AADT and 85th percentile speed below 22 mph, it is generally appropriate for cyclists to be mixed with motor traffic, refer to:

- DE205 – Quiet Street.
- DE206 – Cycle Street.

If in rural context with AADT less than 1,000 and 85th percentile speed below 22mph, a quiet lane may be appropriate. Speeds this low in rural roads might be difficult to achieve and for this reason, 85th percentile speeds of 33mph may be acceptable in exceptional circumstances (where motor vehicle totals are much lower), refer to section 11.32 of ATAG.

Step 2B: Links NOT on or directly adjacent to a carriageway

Is there likely to be more than 100 users in total (including people walking, wheeling and cycling) during the peak hour?

If more than 100 users per hour, it is recommended to provide a separated walking, wheeling and cycling route, away from motor traffic. Refer to DE402.

If less than 100 users per hour, both separated and shared use motor traffic free facilities are likely to be appropriate, refer to:

- DE402 – Separated pedestrian and cycle track, away from road.
- DE403 – Shared-use path, away from road.

Step 3: Street classification assessment

Identify the street type (refer to page 25 of National Model Design Codes part 1).

If the route is on a high street, refer to Step 4 – High street assessment.

If the route is on a primary street (for example A road), or a secondary street (such B or C road), refer to Step 5 – Frontage Development Assessment.

If the route is on a tertiary street or lane (unclassified road), refer to Step 9 – Motor traffic speed and volume reduction.

Step 4: High street assessment

Is there strong local support for a high street vehicle restriction area?

If yes, then a vehicle restricted area is likely to be an appropriate solution, refer to section 11.12 of ATAG.

If no, continue to Step 5 – Frontage development assessment.

Step 5: Frontage development assessment

Considering the whole length of the link, is there more than 20% developed frontages with property access on both sides, one side, or neither? See part M2 for assessment.

If both sides, proceed to Step 6 – Determine street operation.

If neither side, proceed to Step 8 – Demand and context assessment.

If one side, can the cycle link be provided on the side without property access? If yes then proceed to Step 8, otherwise proceed to Step 6.

Step 6: Determine street operation

Is the street one-way for motor traffic (or can it be made one way)?

If yes, proceed to Step 7 – Contraflow options.

If no, separated walking, wheeling and cycling infrastructure is likely to be the most appropriate solution, refer to:

- DE101 Footway.
- DE308 Cycle lane with light separation.
- DE311 Stepped cycle track.
- DE313 Cycle track along road separated from footway.
- DE314 Two-way cycle track in the centre of the carriageway.

If these are not deemed suitable for the location, then refer to Get Out Clause.

Step 7: Contraflow options

Are motor speeds and traffic volumes suitable for contraflow design options?

If yes, then a footway and cycling mixed with motor traffic with contraflow cycle infrastructure is likely to be the most appropriate solution, refer to:

- DE101 – Footway.
- DE303 – Protected contraflow.
- DE304 – Unprotected contraflow (may only be suitable below 1000 AADT).

If these are not deemed suitable for the location, then refer to Get Out Clause.

If no, then separated walking, wheeling and cycling infrastructure is likely to be the most appropriate solution, refer to:

- DE101 Footway.
- DE308 Cycle lane with light separation.
- DE311 Stepped cycle track.
- DE313 Cycle track along road separated from footway.
- DE314 Two-way cycle track in the centre of the carriageway.

If these are not deemed suitable for the location, then refer to Get Out Clause.

Step 8: Demand and context assessment

Are any of the following statements true?

1. There is likely to be more than 100 total users of the facility in the peak hour.
2. There is likely to be less than 100 users per hour in the peak hour, but more than 100 users per day, and there is space, or space can reasonably be made, to provide separated walking, wheeling and cycling infrastructure.
3. There are less than 100 users per day, but there is a contextual reason, such as steep gradients, to separate people walking and wheeling from people cycling.

If any of the above statements are true then, then separated walking, wheeling and cycling infrastructure is likely to be the most appropriate solution, refer to:

- DE101 Footway.
- DE308 Cycle lane with light separation.
- DE311 Stepped cycle track.
- DE313 Cycle track along road separated from footway.
- DE314 Two-way cycle track in the centre of the carriageway.

Otherwise, shared use between people walking, wheeling anc cycling is likely to be appropriate, refer to:

- DE401 Shared-use path alongside road.

If these are not deemed suitable for the location, then refer to Get Out Clause.

Step 9: Motor traffic speed and volume reduction

If urban or suburban context, it is recommended to implement motor traffic reduction measures to achieve:

- Fewer than 2,500 AADT, and
- 85th percentile speed below 22 mph.

This makes it generally appropriate for people cycling to be mixed with motor traffic, refer to:

- DE205 – Quiet Street.
- DE206 – Cycle Street.

If rural context, it is recommended to implement motor traffic reduction measures to achieve:

- AADT less than 1,000,
- 85th percentile speeds below 22mph and,
- Fewer than 5% HGVs.

This makes it generally appropriate for quiet lane treatment, refer to section 11.33 of ATAG.

Get Out Clause

If available space is just too narrow for specified arrangement at desirable minimums on ATNM link: first; narrow carriageway lanes to minimum required (see table 9.12) then remove car parking, then consider land acquisition. If that doesn't solve the issue move to Step 9 – Motor Traffic Speed and Volume Reduction, or realign ATNM link.

Section M2: Development frontage percentage estimation

The assessment of the percentage of developed frontages along a link is required in the ATNM Link Design Selector.

This section provides guidance for practitioners to consider when undertaking the estimation of developed frontages along an ATNM route.

- **Starting and finishing locations** – The start and end points of developed frontage estimation should generally map to human experience of transitional locations and places. This means that the consideration of link lengths may be best started or finished at a junction, crossing, trip generator (such as shopping area, school, hospital, for example) or other real-world feature. Start and finish locations should not be selected based on convenience, political boundaries or project budgets.

- **Length of assessed link** – The length of the ATNM link records mapped by local authorities varies between tens of metres to tens of kilometres. However, only lengths of 1 to 5 km should be considered in this assessment. This is to help provide a coherent user experience, as 1-5 km is the most common length of journey by walking, wheeling and/or cycling. For example, an assessed link between an urban fringe school and a bus or rail station might comprise several shorter ATNM links, or a fraction of a longer one. Though a project team may only have budget for the development of a 500m section of the school-station hub link, it should still consider the assessment of developed frontages between real-world features in approximately 1 to 5 km lengths. This way future projects can complete the link to an appropriate standard when funding becomes available.

- **Developed and undeveloped** – A frontage requires two things to be considered as 'developed'.

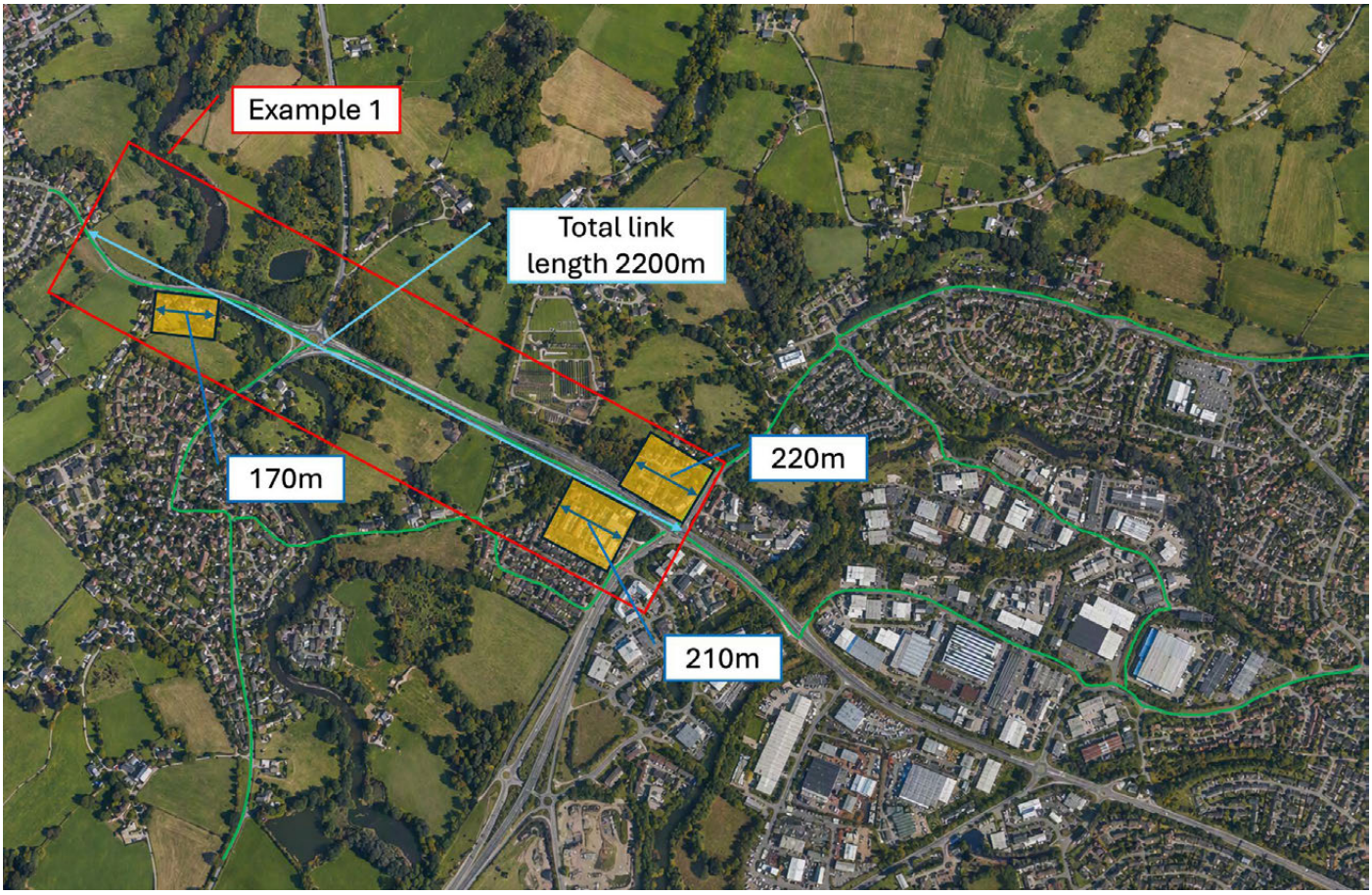
    1. It should have access to and from buildings for people walking, wheeling, cycling or driving from the street or highway.

    2. It should have buildings facing onto the street or highway that are no more than 50m from it. The street should not be separated from the street or highway by forestry or fields, but hedges, gardens or fences would not stop a frontage being considered as developed.

- **Subdivision of lengths** – There may be a desire by project teams to sub-divide a coherent link into shorter scheme or sub-lengths that provide an answer that is more acceptable for political or technical reasons. This should be avoided, as it will not create a coherent journey experience for users.

Example 1

Figure M.1: Example 1



Considering the whole length of the link, is there more than 20% developed frontages with property access on both sides, one side, or neither?

Example calculation based on numbers measured above

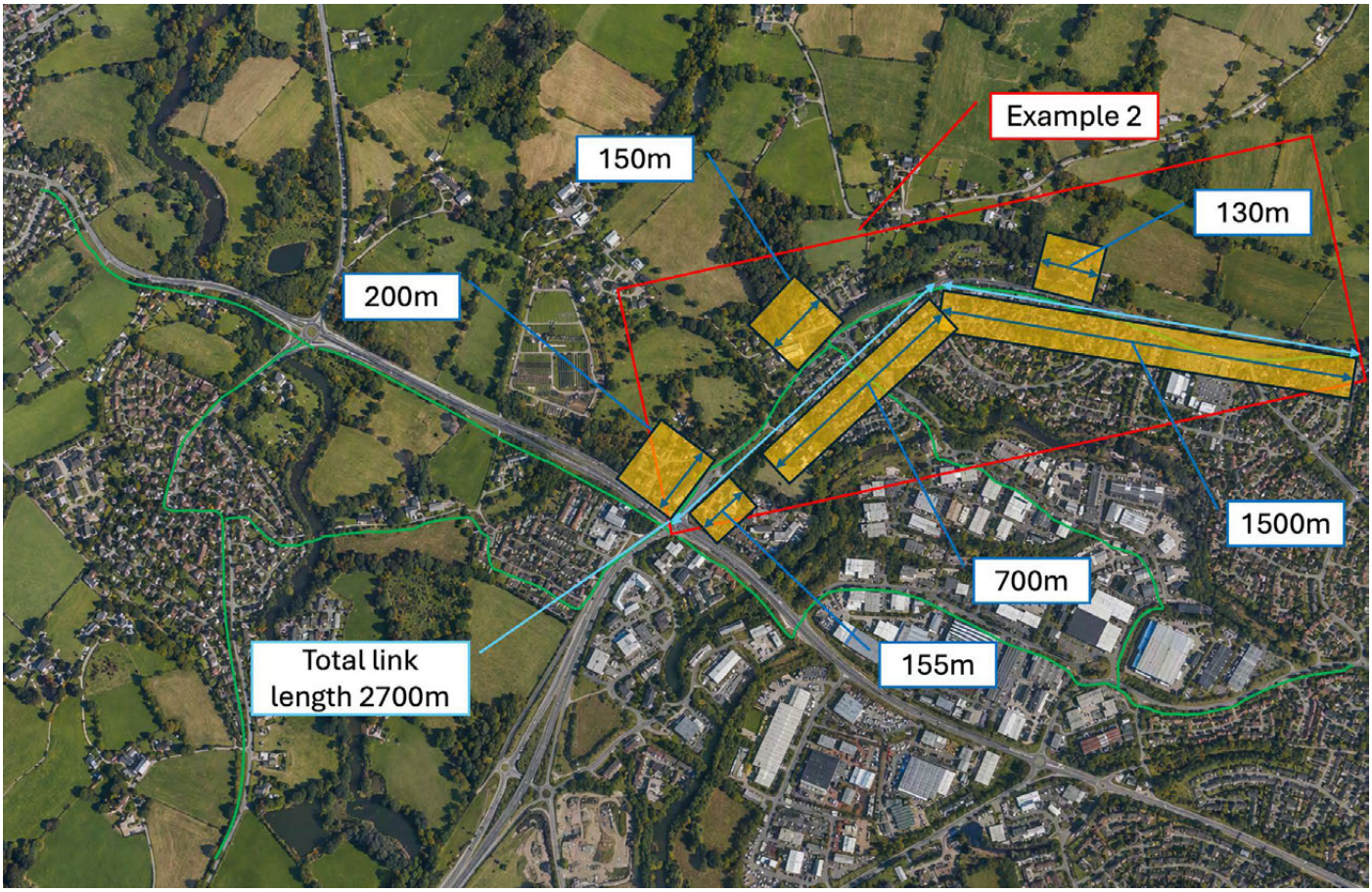
North side developed frontages percentage = 220/2200 x 100 = 10%.

South side developed frontages percentage = (170+210)/2200 x 100 = 17%.

Answer = Neither.

Example 2

Figure M.2: Example 2



Considering the whole length of the link, is there more than 20% developed frontages with property access on both sides, one side, or neither?

Example calculation based on numbers measured above

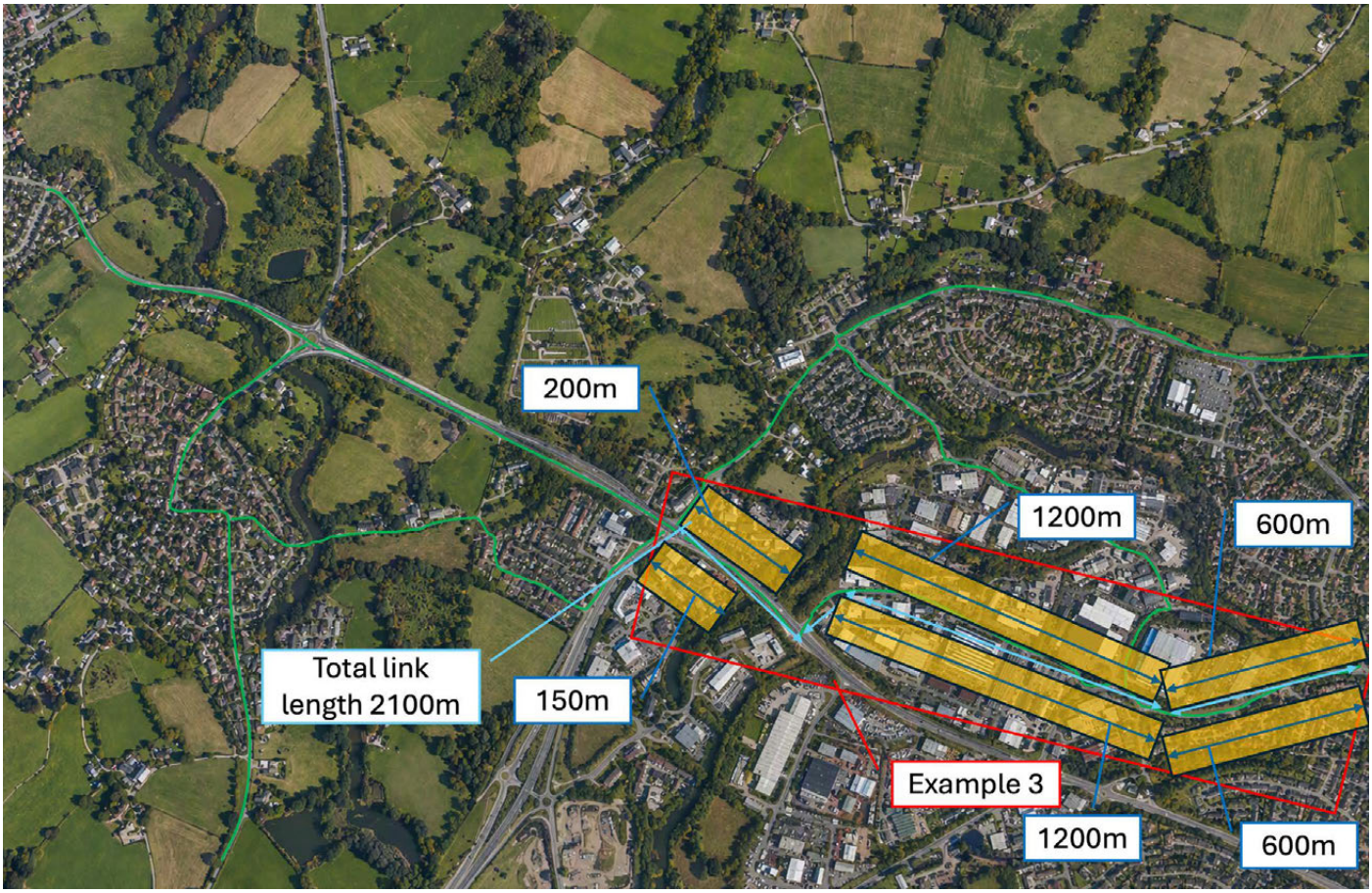
North side developed frontages percentage = (150+200+130)/2700 x 100 = 18%.

South side developed frontages percentage = (155+700+1500)/2200 x 100 = 87%.

Answer = One side.

Example 3

Figure M.3: Example 3



Considering the whole length of the link, is there more than 20% developed frontages with property access on both sides, one side, or neither?

Example calculation based on numbers measured above

North side developed frontages percentage = (200+1200+600)/2100 x 100 = 95%.

South side developed frontages percentage = (150+1200+600)/2100 x 100 = 93%.

Answer = Both sides.



Useful resources

Chapter 1: Introduction

- National Assembly for Wales (2013) Active Travel (Wales) Act
- Senedd Cymru (2024) Environment (Air Quality and Soundscapes) (Wales) Act 2024
- UK Government (2021) Llwybr Newydd: the Wales Transport Strategy

Chapter 2: The duties on local authorities and Welsh Ministers

- National Assembly for Wales (2013) Active Travel (Wales) Act
- UK Government (2010) Equality Act 2010
- UK Government (1980) Highways Act 1980
- UK Government (1991) New Roads and Street Works Act 1991
- UK Government (1984) Road Traffic Regulation Act 1984
- UK Government (2004) Traffic Management Act 2004
- Welsh Government Data Map Wales

Chapter 3: Policy and legislative context

- Design Commission for Wales (2020) Placemaking Wales Charter
- Equality and Human Rights Commission Technical guidance on the Public Sector Equality Duty: Wales | EHRC
- National Assembly for Wales (2013) Active Travel (Wales) Act
- National Assembly for Wales (2006) Transport (Wales) Act 2006
- National Assembly for Wales (2015) Well-being of Future Generations (Wales) Act
- UK Government (2016) Environment (Wales) Act 2016
- UK Government (2010) Equality Act 2010
- UK Government (2010) Flood and Water Management (Wales) Act
- Wales Statutory Instruments (2011) The Equality Act 2010 (Statutory Duties) (Wales) Regulations 2011
- Wales Statutory Instruments (2012) The Play Sufficiency Assessment (Wales) Regulations 2012
- Walk Wheel Cycle Trust (2025) Walking and Cycling Index' 2025: UK report
- Welsh Government (2019) Action on disability: the right to independent living
- Welsh Government (2025) Anti-racist Wales Action Plan: 2024 update
- Welsh Government (2020) Clean air plan for Wales: Healthy air, healthy Wales
- Welsh Government (2021) Future Wales: the national plan

- Welsh Government (2019) Healthy weight healthy Wales
- Welsh Government (2024) Introducing default 20mph speed limits
- Welsh Government (2025) LGBTQ+ Action Plan for Wales
- Welsh Government (2021) Llwybr Newydd: the Wales Transport Strategy 2021
- Welsh Government (2019) Low carbon delivery plan
- Welsh Government (2021) Planning Policy Wales
- Welsh Government (2024) Play Sufficiency Assessment Toolkit
- Welsh Government (2025) Strategic Equality and Human Rights Plan 2025-2029
- Welsh Government (2018) Sustainable Drainage Systems (SuDS)
- Welsh Government (2024) Technical Advice Note 24: The historic environment
- Welsh Government (2025) Wales: a play friendly country
- Welsh Government (2024) Welsh transport appraisal guidance (WelTAG)

Chapter 4: Network principles and requirements

- Department for Transport (2017) English Local Authorities' Cycling and Walking Infrastructure Plans
- National Assembly for Wales (2013) Active Travel (Wales) Act
- Walk Wheel Cycle Trust Active travel school plans in Wales
- Walk Wheel Cycle Trust (2016) Key walking and cycling statistics for the UK
- Welsh Government Data Map Wales
- Welsh Government (2021) Planning Policy Wales

Chapter 5: Consultation, engagement and promotion

- Commonplace
- Living Streets Walk to School
- National Assembly for Wales (2013) Active Travel (Wales) Act
- National Assembly for Wales (2016) Environment (Wales) Act 2016
- Transport for Wales Active travel promotional toolkit
- UK Government (2010) Equality Act 2010
- Wales Council of the Blind
- Walk Wheel Cycle Trust Active Journeys Programme
- Welsh Government (2018) Children and young people's national participation standards
- Welsh Government (2024) Statutory Guidance for the Well-being of Future Generations
- Welsh Government (2015) Well-being of Future Generations (Wales) Act 2015
- Welsh Government (2024) Welsh transport appraisal guidance (WelTAG)

Chapter 6: Monitoring and reporting

- Transport for Wales Active Travel Monitoring Framework
- Welsh Government (2021) Llwybr Newydd: the Wales Transport Strategy 2021

Chapter 7: Introduction to planning and design

- The Chartered Institution of Highways & Transportation (2010) Manual for Streets 2
- Department for Transport (2007) Manual for Streets
- National Assembly for Wales (2013) Active Travel (Wales) Act
- National Assembly for Wales (2006) Transport (Wales) Act 2006
- Standard for Highways (2021) CD143 Designing for walking, cycling and horse-riding
- Standards for Highways Design Manual for Roads and Bridges (DMRB)
- Standards for Highways Design Manual for Roads and Bridges (DMRB) GG 119
- Standards for Highways (2019) GG142 Walking, cycling and horse-riding assessment and review (WCHAR)
- UK Government (2015) Construction Design and Management Regulations 2015
- UK Government (1980) Highways Act 1980
- UK Government (1991) New Roads and Street Works Act 1991
- UK Government (1984) Road Traffic Regulation Act 1984
- UK Government (2004) Traffic Management Act 2004
- UK Government (2000) Transport Act 2000
- Welsh Government (2020) 114/20: supplementary guidance for the safety at street works and road works code of practice
- Welsh Government (2021) Compulsory purchase in Wales and 'The Crichel Down Rules) Circular 003/2019
- Welsh Government (2014) (PAG) 101/14: departures from standards for trunk roads and motorways
- Welsh Government (2021) Planning Policy Wales
- Welsh Government (2021) Procedure and Advice Guidance (PAG) 115/20: Active Travel and Trunk Road Improvement Schemes
- Welsh Government (2025) Welsh transport appraisal guidance (WelTAG)

Chapter 8: Placemaking

- Bornioli, A. (2018) The influence of city centre environments on the affective walking experience, Instituto de Salud Global de Barcelona
- British Standards (2018) BS8300-1:2018 Design of an accessible and inclusive built environment – External Environment
- Cairns, M. (2025) "I definitely choose routes actively, that will take me through nature" The role of nature in cycling decision-making. Presented at University Transport Study Group 2025, University College, Dublin
- Cairns, M. (2024) Nature and cycling: A literature review. Presented at Royal Geographical Society Postgraduate Midterm 2024, Royal Geographical Society, London
- Department for Transport (2022) Inclusive mobility
- Department for Transport (2007) Manual for Streets
- Design Commission for Wales (2020) Placemaking Charter Wales
- Ferguson, A (2018), Playing out: a grassroots street play revolution. Volume 3, Issue 1-2: Cities & Health Child-friendly cities
- Geary et al (2023). Ambient greenness, access to local green spaces, and subsequent mental health: a 10-year longitudinal dynamic panel study of 2·3 million adults in Wales. Volume 7, Issue 10 The Lancet
- Make Space for Girls (2023) Research background 2023
- Monmouthshire County Council (2024) Green Infrastructure Strategy Executive Summary
- Natural Resources Wales (2016) Complete canopy cover study of all its urban areas
- Plantlife (2019) Managing grassland road verges for wildlife
- Play Wales (2023) How to organise playing out sessions on your street
- Play Wales (2023) Opening streets for play
- Play Wales (2008) Public Space Lessons: Designing and Planning for Play
- Rhondda Cynon Taf County Borough Council (2022) Pontypridd Town Centre Placemaking Plan
- Royal Society for the Prevention of Accidents (RoSPA)
- The Trees & Design Action Group
- Tim Gill (2007) No Fear: Growing up in a risk averse society
- Trees for Streets (2021) Street Trees are worth their weight in gold – Trees for Streets
- United Nations General comment no. 17 (2013)
- Welsh Government (2023) Ministerial review of play: Background paper
- Welsh Government (2024) Planning Policy Wales
- Welsh Government (2025) Play Sufficiency
- Welsh Government (2018) Sustainable Drainage Systems (SuDS)
- Welsh Government (2024) Transforming Towns: support to improve town centres

- Wheels for well-being (2025) Benches and Seating in Public Spaces
- Wildlife Trusts Wales Brownfield landscapes

Chapter 9: User needs

- Adams T & Aldred R (2020) Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure Findings Press
- Arup and Walk Wheel Cycle Trust (2019) Inclusive design in cities and towns
- British Standards (2022) PAS 6463 Design for the Mind. Neurodiversity & the Built Environment
- Centre for Research into Energy Demand Solutions CREDS (2020) E-Bike savings, how much and where?
- Chartered Institution of Highways & Transportation (2010) Manual for Streets 2
- CROW (2016) Design Manual for Bicycle Traffic
- Department for Transport (2021) Guidance on the Use of Tactile Paving Surfaces
- Department for Transport (2022) Inclusive Mobility
- Department for Transport (2007) Manual for Streets
- Department for Transport National Travel Survey
- Department for Transport (2023) NTS 2023: Trips by purpose, age, mode and sex
- Department for Transport (2022) Traffic Signs Manual
- Department for Transport (2016) Traffic Signs Regulations and General Directions (TSRGD)
- Living Streets (2024) The pedestrian pound
- London Cycling Campaign What stops women cycling in London?
- London Legacy Development Corporation (2024) Creating places that work for Women and Girls
- Ramblers Magazine (2019) Best Walking Neighbourhood Poll Page 11
- Sports England This girl can campaign
- Standards for Highways Design Manual for Roads and Bridges (DMRB)
- Transport for London (2019) Pedestrian Comfort Guidance for London
- Transport for Wales Improving everyday journeys for women and girls
- UK Government (2010) Equality Act 2010
- UK Government (1980) Highways Act (1980)
- UK Government (1988) Road Traffic Act 1988
- UK Research Councils (2026) Equality Impact Assessment template
- Walk Wheel Cycle Trust (2020) Reinventing transport: planning for e-cargo bikes
- Welsh Government (2013) Active Travel (Wales) Act 2013
- Welsh Government (2023) Active travel (walking and cycling)
- We Made That (2024) Women's Safety Audit Pilot Project
- Wheels for Well-being (2021) Disability and cycling

Chapter 10: Network planning and map

- National Assembly for Wales (2013) Active Travel (Wales) Act
- National Statistics (2011) Census: Detailed characteristics on travel to work
- Natural Resources Wales Coast Path
- Propensity to cycle tool PCT
- Pucher J. & Buehler R. (2008) Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, Transport reviews, volume 28, Issue 4, page 495
- Walk Wheel Cycle Trust The National Cycle Network
- Welsh Government Data Map Wales
- Welsh Government (2024) Planning Policy Wales
- Welsh Government (2015) Well-being of Future Generations (Wales) Act 2015

Chapter 11: Designing for active travel routes and links

- Active Travel England (2026) Guidance on floating bus stops provision and design
- Active Travel England (2026) Rural Design Guidance
- Adams T. & Aldred R. (2020) Cycling Injury Risk in London: Impacts of Road Characteristics and Infrastructure Findings Press
- Chartered Institution of Highways & Transportation (2010) Manual for Streets 2
- Department for Transport (2022) Guidance on the Use of Tactile Paving Surfaces
- Department for Transport (2007) Manual for Streets
- Department for Transport (2016) Traffic Signs Regulations and General Directions (TSRGD)
- Healthy Streets
- Living streets (2024) Inclusive design at bus stops with cycle tracks
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- London Cycling Campaign (2024) What stops women cycling in London?
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- Transport for London (2019) Pedestrian Comfort Guidance for London
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- UK Government Highways Act 1980
- UK Government (2023) Public Sector Equality Duty: guidance for public authorities
- UK Government (2023) Reported road casualties in Great Britain: pedal cycle factsheet, 2023
- UK Government (2022) Traffic signs manual
- UK Government (2000) Transport Act 2000
- Walk Wheel Cycle Trust Traffic-free routes and greenways design guide

- Waltham Forest Active and Sustainable Transport Schemes
- Welsh Government (2024) Introducing default 20mph speed limits
- Welsh Government Traffic signs and road markings

Chapter 12: Designing for active travel junctions and crossings

- Cairns S., Atkins S., Goodwin P., (2001) Disappearing traffic? The story so far, Municipal Engineer 151: 13–22
- Cairns, S. Goodwin, P. Hass-Klau, C. 1998. Evidence on the Effects of Road Capacity Reduction on Traffic Levels
- Department for Transport (2022) Guidance on the Use of Tactile Paving Surfaces
- Department for Transport (2021) Inclusive Mobility
- Department for Transport (2007) Manual for Streets
- Department for Transport (2022) Traffic Signs Manual
- Department for Transport (2016) Traffic Signs Regulations and General Directions (TSRGD)
- National Assembly for Wales (2013) Active Travel (Wales) Act
- Standards for Highways Design Manual for Roads and Bridges (DMRB)
- Standards for Highways Design Manual for Roads and Bridges (DMRB) GG 119
- UK Government (2025) The Highway Code
- Webb, E.A., Bell S., Lacey R.E., Abell J.G. (2017) UCL Crossing the road in time: Inequalities in older people's walking speeds
- Welsh Government (2026) Side Road Zebra Crossing Guidance
- Welsh Government (2026) Traffic Signs and Road Markings

Chapter 13: Integration with public transport and cycle hire

- Borders Buses Bike friendly buses
- Collaborative Mobility UK CoMoUK
- Department for Transport (2015) Design Standards for Accessible Railway Stations
- Measures of the National Assembly for Wales (2008) Learner Travel (Wales) Measure
- National Assembly for Wales (2013) Active Travel (Wales) Act
- National Rail Train Travel with Bicycles
- Network Rail Station Design Manual
- Office of Road and Rail ORR data portal
- Rail Delivery Group (2016) Cycle rail toolkit 2
- Transport for Wales Bicycle connections
- Transport for Wales Fflecsi bus
- Transport for Wales Taking your bike on the train

Chapter 14: Related facilities

- Bicycle Association (2021) Standards for public cycle parking
- British Standards (2018) BS 8300-1:2018 Design of an Accessible and Inclusive Built Environment
- Changing Places What are Changing Places toilets?
- Department for Transport (2022) Inclusive Mobility
- Department for Transport (2022) LTN 1/94
- Department for Transport (2022) Traffic Signs Manual
- Department for Transport (2016) Traffic Signs Regulations and General Directions (TSRGD)
- Keep Wales Tidy Litter data survey
- National Assembly for Wales (2013) Active Travel (Wales) Act
- Road CC (2015) Inside the mind of a bike thief – learn how to protect your bike
- Sign Design Society & RNIB (2000) Sign Design Guide: A Guide to Inclusive Signage
- Stolen Ride An interview with a former London bike thief
- Welsh Government Data Map Wales
- Welsh Government (2026) Traffic signs and road markings

Chapter 15: Construction, maintenance and management of active travel routes including street works

- Bell, D. (2024) The impact of engineering tree pit solutions on street tree growth and survival
- Bell, D., Doick, K.J. and Sinnett D.E. (2024) The role of engineered tree pit solutions in nature-positive civil engineering
- British Standard (2012) BS 5837:2012 Trees in relation to design, demolition and construction
- Cycling UK Highway Maintenance
- Department for Transport (2022) Guidance on the Use of Tactile Paving Surfaces
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Appendix K

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Appendix M

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Chapter 5

- Ceredigion County Council – figure 5.2.
- Powys County Council – figure 5.3.
- Commonplace – figure 5.4.

Chapter 9

- CROW, Netherlands – table 9.7.
- Department for Transport – figures 9.11, 9.13, 9.16, 9.17, table 9.2, 9.3, 9.6.
- Newport City Council – figure 9.8.
- Phil Jones Associates – figures 9.18, 9.19.
- Walk Wheel Cycle Trust – figures 9.2, 9.3, 9.4.

Chapter 10

- Welsh Government DataMapWales – figure 10.5.

Chapter 11

- Department for Transport – table 11.1 (based).
- Walk Wheel Cycle Trust – figure 11.1, 11.19.
- John Mather – figure 11.6.
- Phil Jones Associates – figure 11.17.

Chapter 12

- Department for Transport – figure 12.1, 12.3, table 12.1 (based).
- Walk Wheel Cycle Trust – figures 12.20, 12.22.
- Phil Jones Associates – figures 12.2, 12.8, 12.27.
- Cambridge City Council – figure 12.26.

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- London Borough of Waltham Forest – figure 13.4.
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- Walk Wheel Cycle Trust – figure 14.9.
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- Ceredigion County Council – figure 14.24.
- Walk Wheel Cycle Trust – figure 14.3.

Chapter 16

- Walk Wheel Cycle Trust – figure 16.2.

Appendix G

- The original design elements, which still form the basis of most of the design elements in the revised draft, were created by Arup.

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