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1. Traffic-free routes overview

The Traffic-free routes overview is part of the Sustrans traffic-free routes and greenways design guide. It covers the key principles in ensuring inclusive design and understanding the functions of traffic-free routes.

Key principles

- Ensuring designs are inclusive
- Environments can be disabling
- Understanding the functions of traffic-free routes

1.1. Inclusive design

1.1.1.

Traffic-free routes must be planned, designed, built and maintained to be inclusive. An inclusive route will provide convenient and unimpeded access for all types of user.

These users will include those walking and wheeling, as well as those riding bikes and, where possible, horses. Each of these users has different and specific needs. A route that only considers the

the built environment. Therefore, those responsible for the planning, design, construction and maintenance of traffic-free routes should:

- Remove inequality and discrimination where it exists and promote equality within designs
- Advance equality of opportunity by facilitating those who face greater challenges
- Consider provisions that are proportionate and relevant to the barriers faced
- Address adversity using evidence
- Address the requirements of the Act with rigour and an open mind
- Ensure follow-up measures are not required

1.1.3

Environments can be disabling by restricting movement and access to services and goods. An enabling environment will improve movement and access to services and goods.

Unfavourable treatment due to a person's ability or perceived difference is discriminatory. Enabling routes will not discriminate against users with protected characteristics. Therefore, traffic-free routes must be planned, designed, built and maintained to be enabling.

1.1.4

A perceived lack of safety is a major barrier to active travel. It is therefore important that designers address both physical and personal safety barriers. For many people, traffic-free routes by their nature are not considered safe.

Their position away from roads, streets or buildings reduce opportunities for passive surveillance. And at certain times of the day low levels of use may also attribute to creating a poor perception of safety.

It is not always possible to address these concerns through design but there are measures that can improve perceptions of safety. These include:

- Increase the number of legitimate path users through behaviour change measures
- Provide high-quality lighting
- Create frequent access/exit points

They must remember that users can be disabled by their environment.

Removing obstructions to inclusivity at a scoping / concept stage is critical to ensuring designs are enabling.

1.2. Function of traffic-free routes

Traffic-free routes play an important role within the transport network. They can serve utility, recreation and tourism functions. Their versatility encourages and inspires people to travel by non-motorised means.

1.2.1

Traffic-free routes should have a coherent purpose within a wider transport network. It is important that they link residential areas, employment areas, schools, transport hubs, healthcare and leisure facilities.

1.2.2

Depending on their function, a traffic-free route could take many forms. Routes with a high recreation and leisure function could consist of a shared space. Routes with a utility function could be separated, with space dedicated to different user groups.

1.3. Types of traffic-free routes

1.3.1

Traffic-free routes can be developed within a range of linear corridors or open spaces. Typical types of routes and the challenges that designers should consider are set out below:

	May need new structures if original ones have been removed
	Can take a lot of effort to clear, particularly where invasive species have established as a result of prolonged disuse
Canal towpath	Level but may not be so direct depending on surrounding topography
	Constrained width and / or headroom at structures
	Heritage features including cobbled surfaces can constrain the quality of
Riverside path	Level but may not be direct if river meanders
	Likely to be subject to flooding
River and coastal flood banks	Consent required from flood defence or drainage authority
	Not direct
	Likely to be in sensitive ecological areas
Woodland and forest paths / tracks	Tree roots can be problematic
	Leaf fall can create detritus on path surface
	Restricted access / logging operations
Farm access tracks	Interface between users and agricultural vehicles
	Agricultural vehicles may require a wider and stronger path construction
Seaside promenades	Bylaws / legal status (cycling may not be permitted)
	Other route users may need significant additional width
	Windblown sand
Urban parks	Bylaw / legal status (cycling may not be permitted)
	Restricted opening times
Amenity spaces (racecourse / golf course etc.)	Third party land owners may not be supportive of wider public access
	Restricted opening times
Old road alignments	Connections to existing road at ends of old alignment
	Condition of old road surface if design life has elapsed
	Consideration of legal agreements
	Costs for ongoing maintenance, particularly where roads are in a state of
All route types above	Personal security if not well overlooked
	Perceived conflict with different users of route or 'main' users of land
	Limited Access Points
	Land Ownership may not be clear

1.4. Route planning

1.4.1

The introduction of a traffic-free route should form part of a network-wide plan. This will ensure that existing and proposed routes are coherent and address the travel needs of an area.

planned developments or changes in land use.

1.4.2

A network-wide plan is useful for understanding budget, programme and implementation priorities. The plan can also assist in helping understand existing inclusivity challenges across the network.

The plan may form the starting point for a Traffic-free Route Scheme Assessment, which will assess the predicted benefits of a route against implementation costs. This exercise will confirm whether investment in a route is viable.

A good network plan can serve to highlight opportunities arising from land-use development. Transport projects and routine highway maintenance can also serve to enhance a traffic-free route network.

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2. Quality standards

Quality standards is part of the Sustrans traffic-free routes and greenways design guide. It covers core design principles, how designers can ensure a high-quality user experience and the importance of monitoring quality.

Key principles

- Core design principles
- Ensuring a high-quality user experience
- Importance of monitoring quality

2.1. Core design principles

The traffic-free route design principles are:

- Be traffic-free.
- Be accessible to all legitimate users.
- Be wide enough to accommodate all users, considering future and predicted usage levels
- Minimise maintenance.
- Clearly and consistently signed.

- Enable all users to safely cross roads.
- Be attractive and interesting places to be.
- Have a smooth surface that is well-drained.
- Feel like a safe place to be.

These principles will ensure routes are inclusive, safe and attractive. Designers should use the principles to supplement their existing knowledge and experience. The principles should be used alongside existing best-practice design guidance.

2.2. Level of Service (User experience)

An enticing traffic-free route can be enough to persuade people to take up a non-motorised mode of transport.

Assessing the performance of a traffic-free route can be useful to understand how enticing existing routes are, or how enticing new routes could be.

2.2.1

The performance of a route is often referred to as ‘Level of Service’. There are existing tools used across the industry to measure Level of Service.

These tools form part of Design Guides such as Design Guidance: Active Travel (Wales) Act 2013, the London Cycling Design Standards, and the Transport for London Pedestrian Comfort Level assessment.

The performance outcome of many of these tools is based upon the following assessment criteria:

- Coherent
- Direct
- Safe
- Comfortable
- Attractive

2.2.2

It is important to understand how user experience performs against the above criteria. To understand this, the following questions could be presented to existing route users.

Designers could also consider these questions to design routes that perform well once constructed.

Assessing quality

Share

SUS

2.3 Monitoring and evaluation

2.3.1

Monitoring information can be used to examine Level of Service and inform future designs. It can also be used to build the case for future support and investment in traffic-free routes, as well as to support the continued improvement of existing routes.

2.3.2

A Monitoring and Evaluation Plan should be developed at the outset of a project. The scheme objectives, outcomes and impacts will be critical to developing the plan.

The following questions will be useful:

- What is the route for? (Objectives: provision of a tourism resource, increasing recreational activity, making journeys to school safer).
- What might the route achieve? (Outcomes: increased tourism activity, increased recreational activity, improved perceptions of safety).
- What results from the intervention? (Impacts: increased tourism revenue, healthier communities, reduction in accidents involving school children).

The development of the plan could be supported through the use of a logic map or framework, an example of which is shown below:

Logic map/framework

Share

SUS

2.3.3

It is important to account for monitoring and evaluation costs at the outset of a scheme. This should include allowances for producing

the plan and undertaking the monitoring itself.

The investment in monitoring should be proportionate to the level of intervention proposed. A new route could need a high level of monitoring. An improvement scheme on an existing route may have lower monitoring requirements.

2.3.4

Data may be available for some existing routes. This can be used to reduce the amount of extra monitoring required. A reduction in monitoring could serve to reduce overall delivery costs.

2.3.5

A wide range of tools are available to collect data. The output requirements of the Monitoring and Evaluation Plan will inform tool selection. Tools will either adopt a quantitative or qualitative approach to data assessment.

A common data collection tool used for traffic-free routes are cycle counters. These can be mounted in the form of detection loops on the surface of the path. They can also be sensors mounted on a post erected alongside a path. Tools can be chosen to accord with the environment in which they are located. For example, cycle counters in timber posts are less visually intrusive in rural environments.

2.3.6

The approach to data analysis should be set out in the Monitoring and Evaluation Plan. This needs to be considered alongside the approach to data collection. Both data collection and analysis should address the requirements of the plan. For example, there is no need to report on school trips if the outcome measure is to understand tourism generated revenue.

2.3.7

Presentation of data and analysis findings must be suitable for the target audience. Detailed analysis may be appropriate for a technical audience, such as designers. But a more visual emphasis may be more appropriate for other stakeholders. Examples of monitoring outcomes are shown below:

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3. People

People is part of the Sustrans traffic-free routes and greenways design guide. It covers methods to ensure traffic-free routes can be used by everyone, behaviour-change campaigns and community involvement.

Key principles

- Ensure traffic-free routes can be used by everyone.
- In most cases, a wide range of users will share a route responsibly and considerately.
- Behaviour-change campaigns can be used to promote responsible sharing of a route.
- Community involvement is key to successful traffic-free routes.

3.1. Traffic-free route users

3.1.1

A traffic-free route must be designed on the assumption that everyone will use it. It is important to understand the challenges faced by different users, as these can affect and impede accessibility in different ways. Without understanding these

challenges, a route could become a disabling environment for some users.

Designers should assume that all users will have different requirements. These requirements could change depending on the time of day, week or year. Asking the following questions can help to understand how different user requirements will effect route design:

- What measures are required to assist visually and mobility impaired users?
- What speeds will different users travel at during different times of the day or week?
- What level of confidence do users have?
- How will path surface types affect the comfort of different users?
- Is there enough width to accommodate all users?

3.1.2
Consulting representatives of user groups at an early stage of a project is critical. This will help designers to understand the challenges faced by different users. As an example, some disabled people may be able to ride a conventional bike for some distance. But if they need to dismount, they may become less mobile and encounter difficulties that able-bodied users would not.

Designers should walk and cycle through the locality of a traffic-free route to understand these challenges. Visiting sites with users of mobility scooters and adaptive bikes can also be helpful. Understanding these barriers and challenges means that they can be addressed through the design process.

3.2 Community involvement

3.2.1

Local ‘ownership’ of a traffic-free route is essential for it to be successful. The involvement of the local community in a route’s maintenance and upkeep is of particular importance. This can help to establish positive user interactions.

Without the local community’s support and a sense of ownership, the route will become less of an attraction. This will be the case even where routes are maintained to an adequate standard. Installing artwork, painted mileposts and flowerbeds can all help to involve the community and create an enjoyable and rewarding public space.

Unveiling of artwork on the Loanhead Railway Extension Path, Edinburgh

3.2.2

Community involvement should take place throughout the planning, design and delivery of a project. This can help ensure that designers are aware of community needs from the start of a project.

3.2.3
When planning community engagement, it is necessary to be clear about what the purpose is. Is it about providing and collecting information, or is it about involving people in decision making? The timing of community engagement in the development of a project is key. It is critical to manage the community's expectations to avoid misunderstandings.

3.2.4

Community engagement is an important aspect of creating an accessible and attractive route. It is important that community engagement is used to understand the needs of those who face the greatest challenges.

These users might not respond to traditional methods of consultation. As they may feel their contribution will not influence the design process, particularly as they may currently face exclusion from transport infrastructure. Furthermore, these users may not be part of, or associated with, formal advocacy groups.

This makes it even more important to ensure that community engagement is accessible to everyone. On this note, consideration must be given to differences between language, culture and opportunity. Engagement will not be effective where these differences are not considered.

Interesting and creative methods of engagement can help to reach a wider audience. These approaches can be more effective than literature-based methods. An example of an alternative engagement approach is shown below:

Information boards to encourage interest in route used at an open day event for the New Malden Raynes Park Scheme, London.

3.2.5

Key to successful community engagement is to identify all stakeholders. To do this, it is useful to think of who is interested in (or affected by) a project and who can influence it. The use of a matrix like the one shown below can be helpful in understanding this.

3.2.6

In some cases, there will be a need to conduct consultation, such as when a new route requires planning permission. This is also the case where schemes need Traffic Regulation Orders (TRO). In this instance, the Highway Authority will need to consult on the proposals. Although the consultation will relate to the introduction of the TRO and not the scheme itself.

When formal consultation is required, it can be beneficial to contact stakeholders in advance. Taking the views of the stakeholders into account prior to formal consultation can help to reduce the likelihood of objections, particularly when designs could be at an advanced stage.

3.2.7
Local community support for a new traffic-free route can be facilitated by the creation of a steering or planning group. The purpose of these groups is to advise upon and support the delivery of a scheme. Such a group could take a variety of forms and may involve the formation of sub-groups.

The formation of sub-groups could help optimise time and capability by focusing on specific areas such as technical design, community engagement or public relations.

New Malden Raynes Park community engagement event used to encourage local participation and ownership of route.

3.3 Volunteers

3.3.1

The creation of a volunteer-based ‘friends of’ group can be beneficial to new and existing routes. These groups can secure ongoing functionality and use by promoting routes to the local community. Well-resourced volunteers can also undertake minor maintenance such as removing debris, vegetation clearance and cleaning sign faces.

3.4 Responsible use

3.4.1

In the majority of cases, a wide range of users can share traffic-free routes responsibly. But in some cases, inconsiderate behaviour can affect the experience of others. This behaviour may include cycling at inappropriate speeds or uncontrolled dogs. The effect of this behaviour can be exacerbated where the width of the path is less than desirable. Such reductions in width can be a result of poor design, or vegetation encroachment due to a lack of maintenance.

3.4.2
A Code of Practice can be effective in encouraging responsible sharing of a new or existing route. These can be useful where physical constraints cannot be overcome.

The creation of a Code should be developed in conjunction with the local community and can help designers to understand the obstacles to users.

This approach can be used during the planning and design stage for new routes, and also years after the implementation of a route where use has increased and physical improvements are no longer possible.

A Code of Practice should be founded on the principle of access for everyone. It should also ensure that all users share the route responsibly. Previous successful campaigns have included the use of ‘share with care’ and ‘share, respect, enjoy’ slogans.

It is important that a Code does not attribute the misuse of a route to a specific user group. Instead, it should focus on promoting responsible behaviour.

3.4.3
For a Code of Practice to be successful, it will need to be communicated to all users of a traffic-free route. This may include engagement events with route users and displaying the Code of Practice on signs or thermoplastic markings as shown below:

Share, Respect, Enjoy thermoplastic marking used on the Comber Greenway, Northern Ireland.

3.5 One Path initiative

3.5.1

The One Path Initiative is aimed at tackling conflict on traffic-free routes. The principles of the initiative are to share, respect and enjoy routes, promoting and enhancing positive sharing behaviours.

This initiative was developed as an alternative to physical signing. It focuses on behaviour change rather than rules and regulations. It also seeks to improve communications and understanding between route users. It achieves this goal by:

- Understanding who uses the traffic-free route and their individual needs.
- Improving relations amongst the users.
- Reducing conflict and thereby complaints.
- Avoiding physical interventions and / or permanent signing and the resulting expense.
- Ensuring route management agencies deliver consistent messages.

The One Path Initiative has been applied to established routes. But its principles can also be applied to routes at the planning and design stage. Applying the principles at this stage can reduce the need for unnecessary signing and control devices.

3.5.2

The One Path Initiative is based on a three-stage delivery programme. The programme focuses on promoting equality and awareness amongst users. This approach was found to result in positive cultural and behavioural change.

The strategy relies upon a community assembled Stewardship Group. This group provides residents and stakeholders with a platform from which to influence project initiatives and balance the needs of all users.

3.5.3.

Stage 1: Enable research and surveys to be undertaken. These will help to understand user behaviour, path usage and conflict areas. It is important to understand initial attitudes of users, focusing on three main areas:

- To understand the path usage patterns and identify when potential conflict is more likely to occur.
- Find out the most common use of the traffic-free route, in particular whether it is used for leisure or commuting.
- To understand the issues and attitudes of all users.

One Path Initiative delivery process

A three-step programme to:

Share

infogr

The surveys required to complete this monitoring should be included within a Monitoring and Evaluation Plan, produced at the onset of a project.

Stage 2: Following the survey, it is possible to identify the main target audience. Separate focus groups are held for each of the key audiences. This enables an open discussion and exploration of each group's experiences of using the route.

With all the information gathered, seek to organise community engagement events focused at target audiences in carefully selected locations. This aims to give all users the chance to take part in shaping the debate, co-creating the campaign, giving a sense of ownership and inclusion, all aiming to adjust behaviours in a positive way.

Stage 3: Develop a bespoke action plan to include the following:

- Ongoing communications plan.
- Template for website communications.
- On-path signing guidance.
- Extended programme of regular face-to-face engagement events with support from stakeholders.
- Ongoing monitoring of behaviour.

Infrastructure improvements to be identified and costed, and an actioned communications plan would be developed and delivered by the team and supported by stakeholder communications:

- Objective 1: Raise awareness and invite to focus groups.
- Objective 2: Promotion of engagement events.

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4. Sharing of paths

Sharing of paths is part of the Sustrans traffic-free routes and greenways design guide. It covers understanding where it is applicable to share and separate paths and good separation techniques.

Key principles

- Understanding where it is applicable to share and separate paths
- Good separation technique

4.1 When is separation required?

4.1.1

Experience shows that paths with no separation can function well with minimal conflict occurring. But this is dependent on users being provided with enough width. Providing enough width enables users to interact in a manner that does not detract from their quality of experience.

Separated routes can be beneficial when applied to certain situations. Particularly where the route serves many functions.

Each situation should be considered on a case-by-case basis. Designers should think their decisions through rather than defaulting to a particular approach. They should also pay attention to how either approach could affect inclusivity. The table below summarises the advantages and disadvantages of each type of provision:

Advantages and disadvantages of separated and shared-use routes

4.1.2

In general, where there is known to be, or anticipated to be, high levels of usage by any particular user group, it is desirable to provide separation. Where there are likely to be issues with people riding bikes at speed, separation is desirable.

This may be relevant where there are long straight alignments or downhill gradients along a route. Designers should consider the following when deciding whether to install a shared or separated path.

Shared or Separated Path

High volumes of any particular user group should not be used alone to determine whether a path should be shared or separated. Designers must also consider:

- Inclusivity – Would a particular approach be more appropriate for ensuring that the route is accessible to all?
- The desire lines of each user group – Do they cross or conflict in any way?
- The volumes of each user group – are these predictable during certain times of the day?
- The needs of more vulnerable route users – Does the route pass near schools or medical/health facilities? Is there likely to be a high composition of vulnerable users on the route at certain times of day?
- Are there any interfaces with the highway network where movements of each user group will need to be controlled?

4.2 Separation treatments

4.2.1

Key to the provision of effective separation is providing enough width for each element of a route. Where there is insufficient width to provide a separated path, an unseparated shared-use path is likely to function better.

4.2.2

Separation can be created by distinguishing between two sides of a path with a painted white line. Research has shown that white-line separation is ineffective in ensuring a high degree of compliance. As such, this approach is not recommended. The image below shows an example of separation using a white line:

Path separated using white-line markings, Hyde Park, London.

4.2.3

Where separation is considered appropriate, the following treatments are recommended. It may be appropriate to combine some of these treatments:

- Separation with a margin
- Separation with a level difference
- Separation with differential surfacing
- Separation with a raised delineator strip.

In addition to the method of separation, consideration should be given to visually impaired users. A layout that aids the movement of these users must be provided. Tactile paving is a tool designers can use to help achieve this.

Path separated using grass delineation strip, New Malden Raynes Park, London.

Path separated using grass delineation strip, Exeter.

4.2.4

The maintenance of a route should not be overlooked when considering separation types:

- Ensure that surfacing types are easily maintainable and provide longevity of use for the path. This is an important consideration

when more than one surface type is used as a form of separation.

- Ensure there is adequate longitudinal and lateral (cross) fall. This applies to a simple shared path or a path separated by a level difference. Where this is not possible, drainage should be used.

4.2.5

Territorial behaviour can be an issue on separated paths. Therefore, the design should ensure that any separation indicates the space within the path that is to be used by each user group.

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5. Signing and wayfinding

Signing and wayfinding is part of the Sustrans traffic-free routes and greenways design guide. It covers the importance of treating signing as an integral part of the design process, signage consistency, legibility and maintenance and the need for designers to be sensitive to the environment.

Key principles

- Signing and wayfinding is an important element of traffic-free routes and should be treated as an integral part of the design process.

- Signing should be consistent and legible throughout a route or network. It must present the correct information to users.
- Signing and wayfinding features need maintaining.
- Signing, wayfinding and street furniture can all serve to create clutter. It is important to consolidate and rationalise signing along routes where possible.
- The approach to introducing these features needs to be sensitive to the environment.

5.1.1

The Traffic Signs Regulations and General Directions 2016 (TSRGD) apply to all signs positioned within the public highway. The regulations ensure that signs are consistent, legible and provide a clear message to road users.

This consistency is achieved by using a standardised palette of colours, symbols, text sizing and sign shapes. In most cases, traffic-free routes will be located outside of the public highway boundary and the requirements of the TSRGD will not apply.

5.1.2

Whilst the requirements of the TSRGD will not apply to most traffic-free routes, many route users will be familiar with the format of signing within the highway environment. Designers should therefore consider the benefits of adopting the style and format of TSRGD prescribed signing.

Signing that adopts the general principles of TSRGD, New Malden Raynes Park, London.

5.1.3

Comprehensive destination signing is key to the provision of safe and attractive places to walk, wheel and ride. Traffic-free routes should be signed at each end and at destinations and links along the route.

Users should be directed to routes from the wider walking and cycling network in an area, using a consistent signing strategy. On

this basis, the introduction of a traffic-free route may result in signing updates on surrounding routes.

Wayfinding features are present throughout urban areas and the highway network. These can include roads, bridges, buildings and landmarks. Routes situated away from the highway network or urban areas do not always benefit from these wayfinding features. Making it easy to become disorientated.

Wayfinding signing along a route is the main solution to addressing the absence of physical wayfinding features. Displaying road names on bridges passing over a route is another method of enhancing wayfinding along a route.

Wayfinding on Trans Pennine Trail, Manchester.

Road name sign on bridge, Fallowfield Loop, Manchester.

Wayfinding Signing on Longdendale Trail, NCN Route 62.

5.1.4

Reducing sign clutter along a route minimises the amount of information path users have to process. This can help to emphasise the messages of signing.

Too many signs situated within natural environments could serve to detract from the aesthetic of a route. It is important to find a balance between providing enough signing to ensure a route is coherent, without eroding its aesthetic appeal.

5.1.5

Creating a route identity can be beneficial in encouraging community participation and ownership. Where a route takes on an identity, it can be helpful to use this as a platform to create a brand.

The brand can then be applied to features along the route, such as signing and street furniture. Examples of branded routes include The Way of the Roses, The Caledonia Way and The Nickey Line.

Branded Directional Signing on The Caledonia Way, Scotland.

5.1.6

How routes fit into a wider transportation context is an important consideration. In remote areas, with high levels of leisure use, signing to public transport facilities may be beneficial. For urban routes with a utility function, it may be more important to sign connections to the wider cycling network.

5.1.7

Distance or time to destinations can be provided on signs. The TSRGD does not permit the use of both distance and time on the same sign within the highway environment. It is recommended that this approach is also adopted for traffic-free routes. However, it is down to the professional judgement of the designer to determine the most suitable approach.

On an urban route that has high utility use, time to destinations may be the most appropriate approach. For longer distance recreational routes, a distance to destinations may be more appropriate, as those cycling at their leisure are likely to be less time-pressured to reach their destination.

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6. Space requirements

Space requirements is part of the Sustrans traffic-free routes and greenways design guide. It covers the importance of treating signing as an integral part of the design process, signage consistency, legibility and maintenance and the need for designers to be sensitive to the environment.

Key principles

- Enough width should be provided for all users of traffic-free routes. The width must accommodate those walking and wheeling, as well as those riding a bike or a horse.
- Traffic-free routes must be designed to accommodate standard, adaptive and utility bicycles.

6.1 User dimensions

6.1.1

Traffic-free routes should be designed to ensure there is enough space for everyone. The space provided should enable users to enjoy the route in a safe, relaxed and sociable manner.

Designers should be aware that all path users will have different space requirements. People riding bikes will have different requirements to people walking side-by-side. Space requirements may also change throughout the day, week or year. For example, a utility route may have a higher number of cyclists during the morning and evening peaks.

A utility route may have higher numbers of cyclists during the morning and evening peaks.

It is important for designers to consider how changes in path usage can affect space requirements. Failing to do so could result in the exclusion of some users groups.

6.1.2

When considering space requirements for people riding bikes, the typical dimensions of a conventional bike are 1.8m long and 0.65m wide. For a solo adult cyclist, 0.75m is the typical static width. However, extra width must be considered to account for lateral movement when in motion.

This extra width is often referred to as ‘deviation’. The total of the static width and deviation of an adult cyclist amounts to a ‘dynamic’ width. Designers should note that dynamic width could vary depending on the speed and type of bike. See the design envelope of a conventional bike below:

6.1.3

An inclusive approach to implementing traffic-free routes means that all types of bike must be considered through the design process. Designers should assume route use by cargo bikes, bikes towing trailers and adaptive bikes.

These bikes can come in a variety of different lengths and widths. The diagram below shows some examples of the types of bikes that routes must be designed to accommodate:

Understanding user space requirements is a useful tool when designing a route. Established guidance uses a standardised design envelope to account for a variety of different types of bike. The design envelope adopted throughout this guidance consists of a 1.3m width by a 2.5m length. This standard is taken from the London Cycling Design Standards.

Designers should note that the Highways England guidance adopts a design envelope of 1.2m width by 2.8m length. Using this design envelope would also be a satisfactory approach when designing traffic-free routes and greenways.

6.1.4

Walkers and wheelers also have specific space requirements. The table and figure below sets out typical widths associated with people walking and wheeling.

Typical footway widths for people walking

(source: Inclusive Mobility, DfT 2002)

6.1.5

Widths required for people walking and wheeling.

6.1.6

Horse riders are regular users of traffic-free routes. They have different space requirements to walkers, wheelers and those riding bikes.

British Horse Society guidance recommends at least 3m width for horse riders. Irrespective of whether a path is bounded by a hedge or fences, or may become bounded by such in the future.

6.2 Headroom

6.2.1

Headroom on a traffic-free route should be provided as set out in the table below. The minimum headroom requirements should be provided over the full width of the path surface and the adjacent verges.

6.2.2

Where an existing structure is being adapted for use as part of a route, it may be possible to relax headroom requirements. In this instance, mitigation measures such as advance warning signing would be required.

Relaxing headroom requirements must be considered through a Designers Risk Assessment. This will ensure that any residual risk is acceptable to the Design Team and the custodian of the route.

Adopting anything other than the preferred standard will also need to be assessed with regard to its potential to exclude users. Where the risk of exclusion cannot be eliminated, designers should question the suitability of the environment for a traffic-free route.

Restricted headroom at structure, Newton Abbot, Devon.

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7. Geometric design

Geometric design is part of the Sustrans traffic-free routes and greeways design guide. It covers managing speed and providing enough width for all users by presenting minimum design criteria for horizontal and vertical alignments, as well as suitable visibility.

Key principles

- A well-designed traffic-free route will manage speed and provide enough width for all users.
- Minimum design criteria for horizontal and vertical alignments.
- Suitable visibility should be provided to ensure the safety of all users, especially on the approach to roads.

7.1 Design speed

7.1.1

The geometric design of a route will be influenced by the likely speeds at which users will move along it. Visibility along the route, route function and accessibility will also influence geometric design.

7.1.2

Where traffic-free routes are intended to be used as a shared-use facility, interactions between different user groups will be greater, and so speeds are reduced.

On this basis, the concept of design speed becomes less important. Instead, geometric design will be guided by the space required for users to manoeuvre in a way that does not cause inconvenience or delay.

7.1.3

People on bikes are likely to be the highest speed users of traffic-free routes. There are two scenarios where inappropriate speeds are likely to cause an issue:

- Higher-speed users intimidate and jeopardise the safety of lower-speed users, resulting in a reduction in use of the route.
- Speed is inappropriate at interfaces between the route and highway, such as roads and junctions.

7.1.4

The alignment of a well-designed route should encourage appropriate speeds. Providing enough width along a shared-use path can reduce the impact of inappropriate speeds. As there is more space for users to interact and higher speed differentials between users can be accommodated. Where sufficient width cannot be provided, the following measures may help to encourage appropriate speeds:

- Promotion of responsible use of the path, such as a One Path Initiative (Section 3.5).
- The use of signing and surface markings.
- Artwork and other features to create a greater sense of place.

The provision of physical measures to control user speeds, such as speed humps and rumble strips, must be avoided. These features can serve to reduce the convenience and attractiveness of a route and can make a route inaccessible to some users.

7.1.5

Where it is necessary to encourage slower speeds on approach to a hazard, the preference is to introduce a change in horizontal alignment that will require users to slow down. For example, introducing a 90-degree turn on the approach to a highway interface.

Designers must take care when introducing more severe changes in alignment. It is important that these do not result in people riding bikes or horses having to dismount.

Change in path alignment on approach to highway, Dewsbury, Yorkshire.

7.2 Widths

7.2.1

The width of a traffic-free route is fundamental to its success. Routes should be designed to enable users to move side-by-side, comfortably overtake, and pass other users travelling in the opposing direction.

Widths should also encourage use of the route as a sociable facility, where people can interact as they walk, wheel and ride side-by-side. Widths should be proportionate to the anticipated level, and type, of use.

7.2.2

The effective width of a traffic-free route is considered the 'useable' width of the route. Providing a path width that satisfies the requirements of the table below does not mean a suitable effective width will have been achieved.

The table below builds upon the principles of user space requirements and summarises the absolute and desirable minimum effective widths:

Recommended effective widths of shared use routes

Share

SUS

7.2.3

Features located at the side of a traffic-free route can have the effect of reducing effective width. For example, users of a 3m shared use path with fencing either side may 'shy' away from the fences. In practice, the 'shy distance' can have the effect of offsetting path users towards the centre of the path.

Subsequently, a 3m wide shared-use path with fencing either side may only have an effective width of 2m. Put more simply, only 2m of the path is considered functional by path users, even though there is a 3m wide surface.

Designers should note that shy distances are more applicable to people on bikes and horse riders than other path users. This is mainly due to the risk of handlebars, pedals and stirrups striking vertical features situated alongside the path edge. Thus the effect of shy distances on the effective width of a path needs to be considered against the composition of users of the traffic-free route.

The table below summarises the extra width that can be added to a path to achieve or maintain effective widths. These are applicable where vertical features are present alongside the path.

Additional widths to maintain effective widths

7.2.4.

The widths provided above are intended as a guide. In some cases, there may be benefits in exceeding these widths, particularly where routes may be used as a safe route to a school. Providing a greater width will also increase level of service and provide passive capacity for future growth in use.

Whilst increasing the widths of routes can provide many benefits for users, it can also be costly to projects. As such, the proposed width of route should be assessed through a Scheme Assessment during the planning stage. This will assist in clarifying what width of route is required to meet the objectives of the scheme and ensure the route is inclusive.

7.2.5

Where a traffic-free route is located next to a road, within the highway verge, it must be separated from the edge of road. The table below summarises the level of separation required.

Horizontal separation between traffic-free route and road

*** Separation width may include the paved hard strip where there is one. Source: Highways England**

Traffic-free route alongside highway, Millwall Path, London

7.3 Typical cross-sections

The following figures illustrate a number of typical cross-sections for traffic-free routes:

7.4 Horizontal alignment

7.4.1

The horizontal alignment of a traffic-free route is fundamental to creating an environment that is inclusive, safe, attractive and memorable. Horizontal alignment will largely be predetermined by the topography of the site, particularly where the route follows a railway corridor or canal towpath.

7.4.2

Depending on the function and user composition of a route, curvature will vary. A route that has a high proportion of commuters using bikes should consider the use of larger radii to ensure that higher speeds can be maintained. In general, routes with a high commuter composition should avoid the use of radii lower than 25m.

Where routes have more of a recreational function, smaller radii may be used to encourage lower speeds. In recreational environments, designers should avoid the use of radii smaller than 15m. Except in specific circumstances.

7.4.3

Where the horizontal alignment is being used to control speeds, such as on the approach to a hazard, a minimum (inside) radius of 4m is appropriate. This will still be negotiable by someone riding a bike but will require a reduction in speed to negotiate the curvature.

Horizontal alignment serves to reduce cycling speeds.

7.4.4

Junctions between paths should have either a 2m radius or a 45° chamfer. This will assist users in negotiating a sharp change in direction. It will also help to reduce conflict and discourage people on bikes from creating informal routes across the verge.

Radius used at junction in route on Nene Way, Northamptonshire.

7.5 Vertical alignment

7.5.1

Local topography can have an impact on the vertical alignment of a route. It is important that designers overcome the impacts of local topography through design.

The design of vertical alignments should ensure that routes remain inclusive, accessible and attractive. The vertical alignment of a traffic-free route should follow the gradients listed in the table below.

Gradients on traffic-free routes

* Any gradients greater than 5% are considered a ramp (Inclusive Mobility, DfT 2002). Where these gradients are used, l
platforms must be introduced at regular intervals through the ramp.

7.5.2

Where existing ground profiles are not excessive, it may be possible to meander or ‘zig-zag’ the route. Whilst this may increase the length of a route, it may reduce the need for earthworks (Section 7.5.3) or retaining structures (Section 10.5). Where this approach to route alignment is adopted, it is common to introduce a set of steps. These provide those walking with a more convenient and direct route up the steeper parts of the existing ground profile.

Path along gradient without retaining structures.

7.5.3

'Cut and fill' earthworks can be used to overcome irregular or excessive ground profiles. This process involves moving earth from one section of route to another to create a more regular gradient. The figure below provides an overview of how cut and fill can be used to create a more consistent and attractive gradient to users.

Cut and Fill used on a traffic-free route.

In this example, the black line represents the ideal vertical path profile. This profile overcomes the undulating nature of the existing ground profile. The two highest points of the existing ground profile can be 'cut' to 'fill' the lowest point in the existing ground profile. In this case, the amount of cut material exceeds the volume of fill material required.

7.5.4

Designers should be aware of the potential for greater speed differentials between users on gradients. This occurrence can affect comfort and safety along routes. Therefore, designers should consider whether more localised width or separation is needed as mitigation. Additional width may also be required on steep uphill gradients. As the effective width of those riding bikes uphill will increase.

7.5.5

Care should be taken to avoid designing a route that has lower sections than the surrounding ground profile. This may result in surface water draining onto the route.

In this scenario, standing water can cause a hazard to users, particularly where the water freezes. Designers should ensure that water sheds from the surface of a path where possible.

This will reduce the likelihood of costly drainage interventions being required post-implementation.
Designers should also note that steep paths could introduce maintenance issues. Where surface water can gather velocity down gradients, it can serve to erode the path surface and verges.

7.6 Ramps and connections

7.6.1

How a traffic-free route connects with a wider transportation network needs careful consideration. Traffic-free routes, particularly those that utilise old railway corridors, canals or rivers, will invariably be required to connect into the highway network.

This requirement presents challenges where, historically, canal towpaths and rail corridors have used structures to ‘grade separate’ the different transport corridors.

Therefore, where routes are planned and designed to use canal towpaths or disused rail corridors, a significant level difference may need to be overcome to provide an ‘at-grade’ interface with the highway network.

Ramp providing access to traffic-free route in Worsley, Greater Manchester.

7.6.2

The vertical alignment of ramps, including the requirement for landings, rest places and handrails should be designed in accordance with the requirements of Inclusive Mobility, DfT 2002. By achieving the requirements of Inclusive Mobility, designers can ensure that traffic-free routes are accessible to everyone.

7.6.3

There may be cases where the location of the ramp and the nature of the route would make the more challenging requirements of Inclusive Mobility disproportionate. For example, where a ramp connects to a canal towpath that incorporates cobbled side arm bridges. In this scenario, wheelers would not be able to use the route even if it could be accessed by a ramp.

Any decision to depart from the requirements of Inclusive Mobility should be documented. Documentation should include an Accessibility Audit / Equality Impact Assessment and Designer Risk Assessment. Under these circumstances, designers must consider how their decisions will affect inclusivity.

7.6.4

The construction of a ramp may need retaining measures. These can increase the cost of a scheme and need additional land to be acquired. The cost of introducing retaining measures needs to be considered against the extra cost of providing a longer route that follows natural ground gradients and does not require retaining measures.

Crib wall Construction on Padiham Greenway, Burnley, Lancashire.

7.6.5

To reduce the likelihood of non-compliant ramp gradients, it may be possible to locally adjust the level of the traffic-free route to decrease the level difference, as shown in the figure below:

7.6.6

Where providing ramped access is not possible, consideration should be given to relocating the access point. Access points could be moved to a position where there is less level difference, or there is space to construct a ramp. The benefit of accessibility to all users is likely to outweigh reductions in directness.

7.7 Visibility

7.7.1

When designing a traffic-free route it is important to provide enough forward visibility. This will ensure that all users are aware of changing situations ahead. Providing enough forward visibility is relevant to those users travelling at greater speeds. This is termed stopping sight distance (SSD) and is the distance travelled in the time taken to react and stop.

Sight distance in motion (SDM) is the distance that someone needs to be able to see ahead when moving to feel safe and comfortable. Typically, this is the distance covered in 8 to 10 seconds whilst moving towards an object.

7.7.2

Traffic-free routes should be designed to achieve the SSD and SDM values set out in the table below. These distances should be provided within the envelope of forward visibility shown in the figure below. The SSD values in the table apply to a level route with a sealed surface, at the design speeds shown. SSD will increase at greater speeds, for downhill gradients and poor surface conditions. Poor surface conditions will include wet and icy surfaces as well surfaces where leaves are present. SSD on unsealed surfaces should be increased by 50%.

*** It should be noted that if a traffic-free route is being designed for people on bikes at 20mph then sep between people on bikes and those walking must be provided.**

7.7.3

Where a traffic-free route joins a road or another route, adequate visibility between users on each route must be provided. Designs should ensure that visibility within the envelope shown in the figure below is not obscured.

This visibility envelope is determined by the speed of traffic (motor or people on bikes) on the major arm of the junction. It assumes that the traffic-free route adjoins a highway network. Although the principles would be applicable to a junction with another traffic-free route.

7.7.4

An ‘X’ distance, measured from the give-way line or edge of the major arm, of 4.5m should be used where possible. This will ensure that route users have adequate time to determine whether they need to stop at the junction.

This distance may be reduced to 2.4m and to 1.0m as an absolute minimum where cycle approach speeds are low and the approach geometry encourages a reduction in speed on the traffic-free route. ‘Y’’ distances will be determined by the type and speed of the road environment.

Typical ‘Y’ distances are shown in the table below:

Visibility at junctions

7.7.5

In circumstances where traffic-free routes adjoin the strategic highway network, achieving the visibility requirements of the Design Manual for Roads and Bridges (DMRB) will be required.

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8. Path specification details

Path specification details is part of the Sustrans traffic-free routes and greenways design guide. It provides an overview of construction specification and details relating to the surfacing, foundations, and edge details.

Key principles

- Construction specification is a key element of creating high-quality traffic-free routes.
- Construction details relate to the surfacing, foundations, and edge details.

8.1 Path construction overview

8.1.1

The path of a traffic-free route will comprise a surface and foundations. A typical cross-section through a path illustrating these components is shown in the figure below:

8.2 Path foundations

8.2.1

The foundations of a path are key to the quality and longevity of the path surface. Path foundations usually comprise of sub-base. This is a layer of compacted aggregate placed on the subgrade, usually compacted native ground. The purpose of the sub-base is to distribute the loads imposed on the path into the ground.

Sub-base being laid and compacted on Lumb to Iron Gate Lane path, Rossendale, Lancashire.

8.2.2

Where a path is being constructed on weak or soft ground, it may be necessary to provide another layer beneath the sub-base. This is typically known as a capping layer and consists of larger stone or crushed rock. The time of year when a path is constructed should also be considered when specifying foundation types.

8.2.3

The use of geogrids and geotextiles may enable a shallower foundation to be provided where ground conditions are poor. These systems can increase the load-bearing capacity of the existing ground. Advice should be sought from an appropriately qualified person when specifying such systems.

Geogrid being laid for Hadrian's Cycleway, Allonby, Cumbria.

8.2.4

The thickness of sub-base should be calculated from the likely path loadings and the load bearing capacity of the subgrade. People walking, wheeling and riding bikes will impose negligible loads. So designers should calculate the composition from anticipated vehicle loadings. These vehicles may use the path to undertake maintenance, gain access to private property or for emergency purposes. Typically, a sub-base thickness of 150mm, after compaction, will be enough. This may be reduced where the subgrade is strong, or increased when soft, wet or poor native ground is encountered.

8.2.5

The sub-base should be an engineered material specified and compacted in accordance with the Manual of Contract Documents

for Highway Works, Specification for Highway Works. The most commonly used is termed Type 1 sub-base, which consists of a well-graded selection of stone size from dust up to 37.5mm.

When considering a minimum layer thickness, the layer should be at least twice the size of the largest stone size. This ensures that no particle can contact the top and bottom of each layer. As this would serve to reduce the interlocking nature of the stone and create weak points in the layer.

8.2.6

Where disused road alignments are incorporated into new path construction, the disused road surface may provide a good foundation that can simply be resurfaced. If a more extensive new construction is required, it may be necessary to perforate or break up the existing surface to provide drainage.

8.3 Path Surfacing

8.3.1

The path surface is a key factor of user experience. A smooth, dry, continuous surface will provide a more inclusive and accessible route than a muddy, rutted surface. To achieve a positive user experience, a sealed path surface is recommended.

8.3.2

The quality of a path's surface can influence the ability of a path to shed water efficiently. Hand-laid surfaces have the tendency to be less even than a machine-laid surface. This can lead to more standing water being encountered along a path. A machine-laid path will provide a more consistent and even surface. This will encourage water to shed and reduce the likelihood of ice occurring during colder weather.

8.3.3

Path surfaces are typically composed of layers of bituminous material. They can also be constructed from other materials, such as concrete. Concrete will provide a good surface in terms of being impermeable, smooth, consistent and hard-wearing. But as concrete is laid in sections, it can result in jointing at regular intervals along a route. These can be uncomfortable to some users, such as people on bikes and wheelers.

Concrete path being laid at Leicester Road Viaduct, Warwickshire.

8.3.4

Whilst less widely used, timber decking and Glass Reinforced Plastic (GRP) panels can also result in jointing along a route. However, timber decking and GRP can offer benefits when used on structures where weight saving is a factor. They can also be beneficial when used at constrained sites where deliveries of concrete or bitumen may not be feasible.

8.3.5

There are many innovative surfacing products being widely used in transportation engineering applications. These products include resin-bound aggregates and recycled rubber and plastic composites. The main draw to some of these products is their use of recycled products, as well as some of their physical characteristics. For example, some surfacing that has a high rubber content can be more flexible underfoot. This may be preferable to horse-riders and runners.

Composite rubber wearing course used on Lumb to Iron Gate Lane path, Rossendale, Lancashire.

Innovative products are currently being used on a number of traffic-free routes. However, their performance and maintenance requirements require careful consideration. As these are still relatively unknown with some products and systems.

8.3.6

Designers are encouraged to explore the most suitable path surfaces to suit the route objectives, user composition, predicted path use and budget (including maintenance). Further considerations will also include skid-resistance requirements, whether a permeable surface is required for the purposes of drainage, and whether certain surface types may serve to exclude route users. For example, horse riders may prefer not to use a route with a concrete or bituminous surface.

8.3.7

Some sealed surfaces are less desirable for horses as they can have insufficient slip resistance for horse’s hooves. A solution to this may be to provide an adjacent trotting strip, which does not need to be finished with a sealed surface.

Trotting strip alongside traffic-free route.

8.3.8

Concerns may be raised where sealed surfaces are proposed within rural areas. Their introduction could be considered to ‘urbanise’ natural environments. To alleviate these concerns, designers can specify alternative surface course materials.

For example, white quartz chippings can be rolled into a bituminous surface. This will to reduce the intensity of what would otherwise be an entirely black coloured surface. Surface dressing and other stone finishes can also be specified, and coloured asphalts are becoming more common.

Designers should also keep in mind that a new bituminous surface would lose it colour intensity with time. Photographic examples of this colour loss may be useful in managing stakeholder concerns.

8.3.9

An example specification for a bituminous path composition is provided in the table below.

Typical bituminous surfacing specification

8.3.10

It is important for designers to consider the drawbacks of path surfacing in terms of impact on user groups. An unsealed surface could be a cost-effective solution but its uneven and rough surface composition would serve to exclude wheelers. Conversely, a route that is surfaced using bituminous material would be smooth and even for wheelers, but it could serve to exclude horse riders. The table below outlines some of the advantages and drawbacks associated with different path surfacing types.

Surfacing materials advantages and drawbacks

8.4 Path edges

8.4.1

Kerbs or edgings are usually provided to contain a path and prevent failure of the path edge from traffic loading. A large proportion of routes may not need kerbing or other edge restraints given that vehicle loadings will be minimal. Where kerbs or edging are not needed, the path should be constructed so the sub-base extends 300mm beyond the surface course on each side.

Sub-base extended beyond path edge on Lumb to Iron Gate Lane path, Rossendale, Lancashire.

8.4.2

Path edgings may be formed from pre-cast concrete edgings, timber edgings or proprietary metallic edgings. Timber edgings are considerably cheaper than other options but consideration needs to be given to providing adequate lateral support. This will ensure that the edgings are not distorted or displaced during laying and compaction of the path construction.

8.4.3

It may be appropriate to provide edgings to a path in locations where a more formal edge is required, such as through parks, or where a route passes through a public realm area.

Furthermore, visually impaired users utilise the edgings and kerbing as a means of guidance. Therefore, when designing a path, designers need to carefully consider the route environment, the needs of visually impaired users, the loadings imposed on the and ground conditions.

8.5 Path drainage

8.5.1
Standing water and surface water discharge can serve to damage a path's surface, leading to a decline in its integrity and its serviceability. Standing water can also freeze during colder weather, creating a facility that is unpopular and underutilised due to safety concerns.

To facilitate surface water run-off, paths should have a cross-fall (fall to one side) or camber (fall from a centre line to both sides). Where possible, designers should incorporate camber to a path's surface, as this will provide a better outcome for wheelers. Cross-fall and camber should be provided in accordance with the table below.

8.5.2

Path edgings can strengthen a route that is subjected to flooding, as the edgings will guard against washout of the sub-base and consequential undermining of the path. It is recommended that in these situations a pre-cast concrete path edging be provided.

8.5.3

The area immediately adjacent to a traffic-free route is termed the verge. A verge width of 1.0 m should be provided on each side of a path. The verges should normally fall away from the path to facilitate drainage of surface water. Verges should be kept clear of any vegetation other than grass, which should be mown and kept cut back as it will tend to encroach onto the path, reducing the effective width.

8.5.4

It is important that surface water not only be shed from the path, but that it does not pond immediately adjacent to the path. Localised ponding adjacent to a path edge may lead to flooding, ice, and mud on a path surface.

8.5.5

Similarly, if bunds are provided along both sides of a path, consideration should be given to how surface water will be allowed to drain away. In these situations, it is likely to be necessary to provide shallow ditches along each side of the path.

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9. Access to routes

Access points associated with a traffic-free route or greenway should be designed to provide access to all legitimate users of the route. This section provides an overview of the design of access points, access controls and the removal of restrictive accesses.

Photo: Andy Catlin/Sustrans

Key principles

- Access to traffic-free routes should be available to all legitimate users.
- Access points should invite users onto the traffic-free route.

- There should be a general presumption against the use of access control measures.
- Where any controls at access points are absolutely necessary, they should not restrict access to legitimate users.
- Access controls should not usually be required to simply control speeds on the approaches to roads or crossing points.
- Access controls may be required to prevent unauthorised access by motor vehicles or to control livestock.

9.1 Access point requirements

9.1.1

The overriding design requirement for an access point is that it is accessible to all legitimate users of a traffic-free route.

A poorly designed access point can serve to exclude users from routes.

Particularly where designers have placed too much emphasis on preventing access by motorised vehicles.

All current design guidance, including Local Transport Note 1/20 (Section 8.3), Welsh Active Travel Act Design Guidance (Section 15.3), Cycling by Design (Section 3.5), London Cycling Design Standards (Section 4.5.15) and Highways England CD 195 (Paragraph E/3.35) states that restrictive access control barriers should not be provided on traffic-free routes.

9.1.2

Designers must fulfil their duties under the Equality Act 2010 when designing access points.

9.1.3

Any access point should have a minimum clear width of 1.5 metres.

Any access point should be able to accommodate the design cycle vehicle (which is 1.2 metres wide x 2.8 metres long).

9.1.4

It is important that an access point does not restrict the flow of users along a traffic-free route.

Provision should be made for two-way flow, which may require a minimum provision of two 1.5 metre wide clear gaps.

Access points are often places where people will pause to confirm directions, take a break or stop for other reasons.

Therefore, consideration should be given to providing sufficient space beside access points for path users to stop safely and away from the road.

Additionally, when this space is in use, access to the path should not be blocked for other users.

Where access points are set back from the edge of a road, designers should consider how to prevent the access point being obstructed by parked vehicles.

9.1.5

Designers should also consider the travelled path of all users passing through an access point.

Where a user has to complete turning manoeuvres to negotiate an access point, the layout should be tracked to ensure that it can be used by the design cycle vehicle.

The effects of gradients and cross-falls need to be taken into account in this assessment.

An alternative approach to using tracking software could be to mark out the layout of an access point using temporary materials and test it with a range of types of cycle.

The advantage of this approach is that designers can assess the level of comfort and complexity of moving through an access point feature themselves.

The local community and accessibility groups can also be involved in these trials as a part of stakeholder engagement.

9.1.6

Access points are an important element of traffic-free routes and are a gateway onto the route.

As such, they should welcome people onto the traffic-free route by being open and accessible.

Access points should enhance both the amenity of an area and the traffic-free route.

Designers should therefore consider scale, materials and colours carefully.

Open and welcoming access point on Avenue Verte (running from Dieppe to Forges-les-Eaux, France). Photo: Nick.x5d, CC0, via Wikimedia Commons https://commons.wikimedia.org/w/index.php?curid=15061793

9.1.7

Designers should engage the local community in the design of access points.

Consideration should be given to working with local artists, urban designers and schools to produce designs for access points.

It might be appropriate to run design competitions to encourage community participation.

Access point designs may provide an opportunity to capture local history or features that are unique to an area.

In doing this, the community can be proud of a feature which they have helped to develop and install.

This approach will also provide opportunities for younger members of the community and visitors to learn about the area.

9.1.8

Consideration should be given to the visibility of any access point features which encroach into the clear width of the traffic-free route, including the immediate verges.

Consider not only those who use the path during hours of darkness or in low light, but also people with sight loss or visual impairment.

9.1.9

Where access points involve ramps, these should be designed in accordance with the guidance provided in section 7 of this traffic-free routes and greenways design guide.

9.2 Preventing unauthorised access

9.2.1

In some cases it may be necessary to provide measures which control access to a traffic-free route by unauthorised users.

Whenever access control measures are required they should be configured so that access is not restricted for legitimate users.

9.2.2

Motor vehicle access can usually be prevented by reducing the clear gaps at an access point.

A clear width of 1.5 metres will prevent access by most motor vehicles.

This can often be achieved with the provision of bollards across an access point.

Where bollards are provided they should be visible during hours of darkness or in low light levels.

This visibility can usually be achieved with the provision of reflective bands on the bollards.

Consideration of the colour of a bollard is important so that they are visible to people with sight loss or visual impairment.

9.2.3

Restrictive access controls are frequently provided to restrict unauthorised access by powered two-wheelers (including motorcycles and trail/dirt bikes).

Simple dimensional considerations mean that any control that will prevent access by a powered two-wheeler will also prevent access by the cycle design vehicle.

Additionally, there may be other ways for a powered two-wheeler to gain access to a route, for example through a gap in the boundary elsewhere.

Anti-social behaviour will generally be more effectively managed through enforcement.

Anecdotally, increased usage of a route may also reduce anti-social behaviour.

Where anti-social behaviour is known to be a problem on an existing route, evidence of actual incidences should be gathered to inform any decisions.

This may include video surveys or reviewing police records.

9.2.4

It may be necessary to facilitate vehicular access through an access point.

This may be for maintenance vehicles or for emergency services.

The simplest approach is likely to be the provision of a removable bollard which will turn two 1.5 metre wide gaps into a single 3 metre wide gap.

Removable bollards should be secured with padlocks or similar.

Consideration should be given to the manual handling requirements of removable bollards.

Removable timber bollard with reflective banding.

Where there is sufficient width, a separate lockable gate could be provided for vehicular access.

This could be provided centrally or to one side of the access point, noting the need to provide a minimum of one (but ideally two) 1.5 metre clear gaps.

Vehicle gate adjacent to two 1.5 metre wide gaps for traffic-free route user access. Note the path surface is not a sealed surface.

Where staggered access controls such as chicanes are used, each panel can be installed as a gate.

One or both panels can then be unlocked and opened to enable access by vehicles.

Opening gates on Greenfield valley path, Holywell, Flintshire. Note the barrier may not be as visible as it could be due to the barrier colour and the effects of light and shade.

9.3 Access points at roads

9.3.1

Where a traffic-free route joins or crosses a road, particular attention should be given to the design of the access point.

Users of the traffic-free route need to be aware of the road and footway ahead of them, and of the need for them to approach at an appropriate speed.

Likewise, users of the road and adjacent footway need to be aware of the traffic-free route.

A common approach in this situation has been to provide a barrier at the access point to physically prevent users of the traffic-free route from accessing the road at speed.

However, such barriers can restrict or prevent access onto or off of the traffic-free route.

A designer will need to reconcile potential tensions between the requirement to provide inclusive access and the need to mitigate any risks associated with an access point.

This may require the equality impact assessment process to be balanced with the road safety audit process.

9.3.2

Access controls, including chicanes, should not usually be required simply to control cyclists on the approach to a road or footway crossing.

It will often be possible to design the approach to a road or crossing point such that users clearly understand the need to take additional care and give way to other users, without providing restrictive barriers.

9.3.3

Where a traffic-free route approaches a road or crossing point, it is essential that users of the traffic-free route are made aware of the road or crossing point through good visibility to and from the crossing point, and the provision of appropriate signs and markings.

9.3.4

Road users, including those on an adjacent footway, should be provided with adequate warning of the access point for the traffic-free route.

This may include ensuring that there is sufficient visibility of the access point, along with the provision of warning signs.

Guidance on the provision and siting of warning signs is included in Chapter 4 of the Traffic Signs Manual.

The use of variable warning signs for road users, which are activated by users of the traffic-free route approaching the access point, may provide a more targeted warning.

'Cycle route ahead' warning sign (TSRGD Diagram 950). The supplementary plate 'Cycles crossing' may be provided where there is a crossing as opposed to a traffic-free route joining the road. Note the positioning of the sign on the off-side of a single lane road, which enhances its visibility.

9.3.5

Providing a change in direction on the approach to a road or crossing point can encourage path users to slow down on the approach.

This can also disrupt any through sight lines along the line of the traffic-free route.

Any changes in route alignment should still provide path users with enough advance warning of the road or crossing point, and so may need to be supplemented with signs and markings.

Any changes in direction in the route alignment should be navigable by the cycle design vehicle.

A change in direction on the approach to an access point onto a road. Note that warning signs and markings could have also been provided.

9.3.6

Warning signs and surface markings should also be considered to communicate the approach to a road or crossing point.

This could include messages such as ‘Busy road/Road ahead’ or ‘SLOW’ and give way markings.

The provision of a warning sign in the middle of the access point may be appropriate.

This could be incorporated with a feature to prevent motor vehicle access.

Warning signs on the approach to a road crossing. Also note the slight stagger in the crossing alignment which reduces the through visibility along the line of the traffic-free route. The two warning signs should be rationalised. Note the surface quality is not ideal.

9.3.7

Where changes in path alignment, signs and markings, or non-restrictive controls such as bollards are not considered sufficient to mitigate the risks in a particular situation, staggered barriers or chicanes may provide a solution.

Staggered barriers or chicanes can restrict access if not carefully designed and so should be subjected to tracking by the design cycle vehicle.

They may also impede two-way flow on a route.

The layout of such controls should be designed on a location specific basis.

Where staggered barriers or chicanes are provided, they should be considered to primarily function as a visual clue that users are approaching a road or crossing point, as opposed to a physical measure.

As such, they are likely to require a significant distance between the two elements of the barrier.

When designing staggered barriers or chicanes, it is best practice to locate the first panel on the nearside of the path.

This will encourage a greater speed reduction before users are required to change their direction.

The panels themselves do not have to overlap.

The image below is an example of an access point where opportunities to change the path alignment were constrained due to the path being on an embankment.

Staggered barriers or chicanes have been used to indicate to users the need to slow down on the approach to a crossing point.

In this case, the panels have incorporated artwork and route numbering.

Staggered barrier/chicane access point incorporating artwork on National Cycle Network Route 78.

9.4 Agricultural crossings and livestock control

9.4.1

Traffic-free routes often have interfaces with, or are situated alongside agricultural land.

As such, landowners, tenants and farmers will sometimes need access across or along a traffic-free route.

This access may be required to transport materials, vehicles or livestock between land and buildings.

There are a number of solutions for providing agricultural crossings and access.

Designers must understand the needs of a landowner or tenant to ensure that the most appropriate crossing is provided.

A poorly designed crossing could have a negative impact on agricultural operations, as well exclude users from the traffic-free route.

9.4.2

In some cases, farming activity may require vehicular and livestock movements along a section of traffic-free route.

This may be to access sections of land or agricultural buildings.

These access requirements will be a key consideration during the design process and should be determined through a stakeholder engagement exercise.

Designers should seek legal counsel and planning advice when negotiating access requirements.

This will assist in understanding the legal status of the route and any lawful requirement to provide access to stakeholders, landowners and tenants.

9.4.3

Designers should develop an understanding of the frequency and loadings imposed by agricultural movements.

This will need to be considered when determining the specification for the path construction.

The movement, including the turning of heavy agricultural vehicles such as tractors, will need a more substantial path specification.

This will help to avoid path failure and damage.

This can usually be provided with a reinforced concrete pad at the crossing.

Where adjacent landowners or stakeholders need access across or along a traffic-free route, designers must consider the frequency and timings of such movements to understand how this could serve to affect users of the route.

9.4.4

The simplest form of controlling the interface between the traffic-free route and an agricultural crossing or movement is to implement a short-term temporary closure of the traffic-free route.

This can be achieved by fully opening the gates of the agricultural land, which then serve to close across the traffic-free route, as shown in the image below.

This arrangement can cause delay to users of the path, particularly where movement of agricultural vehicles, equipment or livestock is likely to take more than a few minutes.

This type of crossing may only be suitable where movements across the traffic-free route are low in frequency and low in duration.

Simple agricultural crossing with reinforced concrete pad.

9.4.5

Where it is necessary to control livestock at an access point, well-designed cattle grids with a minimum clear width of 1.5 metres can provide unobstructed access for many people cycling.

However, they can exclude other users, including those walking, wheeling or riding horses.

Providing a gated access (minimum clear width 1.5 metres) next to the cattle grid can provide an alternative route through the access point.

However, the design of the gates and their method of operation, including two-way latches, must take all users into account so that access is not restricted.

Gated agricultural crossing with cattle grid.

9.4.6

Where horse riders use the route, the specifications of any livestock control features need to ensure that access by horse can still be achieved.

Further guidance can be found on the British Horse Society website.

9.4.7

One of the hazards associated with cattle grids is that the bars can be slippery.

To mitigate this, the designer should give consideration to the location and layout of the cattle grid to avoid the need for users to have to turn on, or in the immediate vicinity of the cattle grid.

Consideration should be given to the profile and finish of the bars.

Flat topped bars (rectangular section) can provide a greater level of comfort but may need to have an anti-slip finish applied.

The use of large diameter, galvanised threaded reinforcement bars can provide a relatively non-slip solution but may have a lower level of comfort.

9.5 Removal of restrictive access controls

9.5.1

There may be opportunities to address restrictive access controls when an existing traffic-free route is being improved.

In these situations, designers should consider whether removing access controls entirely is feasible.

Where this is not possible, designers should upgrade the access control using this guidance.

Regardless of the approach, designers should consult with accessibility groups and other stakeholders.

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10. Supporting details

Supporting details is part of the Sustrans traffic-free routes and greenways design guide. It provides an overview of engineering applications such as lighting, fencing and landscaping to consider when designing a traffic-free route.

Key principles

- Engineering applications such as lighting, fencing and landscaping are important considerations when designing a traffic-free route.

10.1 Lighting

10.1.1

The benefits of lighting a traffic-free route include:

- Improving user ability to navigate the route, particularly at junctions with other routes and decision points.
- Enabling users to identify other users on the route.

- Detection of hazards ahead.
- Discouraging anti-social behaviour and crime.
- Increasing a sense of personal security.

The drawbacks of lighting a traffic-free route include:

- Light pollution.
- Visually intrusive lighting infrastructure.
- Overspill of lighting to nearby residential dwellings
- Vandalism of lighting infrastructure and increases in anti-social behaviour.
- Ongoing cost for power supply and maintenance of infrastructure.

10.1.2

Designers should consider the provision of lighting on traffic-free routes where significant use can be expected after dark.

This is important on those routes that are used by commuters, and those forming part of a safer route to school network, where usage is normally sustained throughout the winter months.

10.1.3

Many routes used primarily for recreational purposes, typically situated outside of built-up areas, are usually unlit.

However, the location, environment and user composition of each recreational route will all be unique and the provision of lighting should be considered on a case-by-case basis, paying close attention to risk, ecological impacts and cost-benefit.

10.1.4

Lighting may need to be provided wherever traffic-free routes have an interface with the highway network, or where road safety concerns exist.

Where lighting is considered necessary at highway interfaces, or alongside the highway, street lighting proposals will need to be discussed with the Local Highway Authority.

This will be important where the adjoining Highway is not sufficiently lit, or does not meet current standards.

Where lighting is provided at highway interfaces, Local Authorities would normally expect the lighting provision situated within the public highway to achieve the requirements of BS 5489-1:2020 - Design of road lighting Lighting of roads and public amenity areas - Code of practice.

10.1.5

Signing on traffic-free routes may need to be lit, or be reflectorised, where significant use is expected during the hours of darkness.

This is important for signs that are advising users of hazards or restrictions along the route, such as limited headroom at an overbridge.

10.1.6

The advancement of street lighting technology has resulted in a number of systems and products being developed that can overcome some of the issues discussed in Section 10.1.1. These include:

- Solar-powered lighting columns that do not require an electricity supply.
- Low-level lighting that isn't as intrusive to neighbouring residential dwellings.
- Sensor-activated lighting that is only active when a user is on the route.
- Surface-mounted lighting that is difficult to destroy or vandalise.
- Lighting provided within timber posts, that is more in keeping with natural environments.

Whilst some of this technology may not provide sufficient levels of lighting for highway environments, or traffic-free routes that are used regularly during the hours of darkness (utility routes), they may be adequate for some recreational routes where a risk assessment has concluded that lighting intervention is required.

10.1.7

Whilst lighting can be used to discourage anti-social behaviour, this should not be used as a location-specific intervention along a route, as sudden changes in light levels could serve to create shadows that can encourage anti-social behaviour further.

Furthermore, sudden changes in lighting levels can also cause discomfort to route users.

10.1.8

Designers should consider that lighting can have an adverse impact on wildlife, including:

- Acting as a lure to migrating birds, which may become disoriented.
- Attracting high levels of insects, resulting in predators taking advantage of gathered prey.
- Drives away some nocturnal pollinators, reducing the ability of plants to bear fruit.

- Increases the proportion of microorganisms in freshwater sediments that are able to photosynthesize under low light levels.
- Disruption of circadian rhythms, altering the timing of sleeping, foraging, mating, and migration.

Designers should seek the advice of an ecologist during the planning and design stage of a route.

Ecological impacts should be determined at an early stage so that designers can develop the most suitable design solutions to eliminate or mitigate ecological impacts created by lighting.

Mitigation of ecological impacts created by lighting could include:

- Protecting existing dark spaces.
- Creating new dark spaces.
- Altering the spectrum of artificial lighting.
- Reducing artificial light trespass.
- Dimming of artificial lighting.
- Part-night lighting.

Designers should work with ecologists to understand the level of mitigation required and then explore the technology available to assist them in successfully achieving this.

These solutions may include further exploration of the technology summarised in Section 10.1.6.

Low-Level Lighting in tunnel, Dartford.

10.1.9

Where it is not possible to light a busy traffic-free route due to visual intrusion or ecological impacts, users should be diverted to a parallel lit route.

However, designers should not simply divert users to the most direct or shortest alternative route.

Routing users along quieter, low-volume and low-speed roads would be the preference under these circumstances.

10.1.10

When designing lighting, consideration should be given towards the effect that lighting columns could have on the effective width of the path.

To achieve sufficient effective widths, lighting columns should be set back from the path edge. However, offsetting columns relative to the edge of the path should be considered in terms of power supply easement, the provision of shallow ducting and maintenance access requirements.

On structures or sections of the path where width constraints are encountered, alternatives to locating lighting columns within the path should be sought.

These alternatives may include mounting lighting units on other features, such as walls or parapets, or using strip lighting alongside the path.

10.1.11

Network-wide plans should be considered at the time of designing lighting along a route.

Where a route could be widened in the future, then the positioning of lighting infrastructure should account for this to mitigate the need for future costly changes.

Similarly, the future introduction of interfaces with intersecting routes should also be considered and passively incorporated into the lighting design where possible.

10.1.12

Solar-powered studs are unlikely to provide sufficient levels of illumination to offer any benefit beyond delineating the edge of a route.

Where provided, solar studs should be inspected regularly and kept clear of fallen leaves, standing water, encroaching vegetation and general debris.

10.1.13

In areas where it is not feasible to introduce an electrical supply, solar-powered column-mounted lighting may be an option. These systems typically involve discrete units with a photovoltaic panel on the same column as the lighting unit.

10.1.14

Maintenance of lighting systems should be considered during the planning and design of a traffic-free route.

Lighting columns can be designed to be lowered to avoid the need for access to be provided for a larger vehicle with an elevating platform to maintain the lighting units.

The maintenance of electrical equipment requires a different skillset to more general traffic-free path maintenance and this would need to be considered during the design of a system.

It is also necessary to consider the ongoing maintenance and electrical supply costs for a lighting system over the lifetime of the route.

10.1.15

Further guidance on the design of lighting for cycling infrastructure can be found in the Professional Lighting Guide 23, Lighting for Cycle Infrastructure (Institution of Lighting Professionals, 2020).

10.2 Road crossings

10.2.1

Traffic-free routes are likely to have an interface with the public highway network, either at the ends of a route or where the route crosses a road.

Where a route crosses a road mid-link, in other words, not at a junction, the type of crossing to be provided should be as set out in the table below.

Type of crossing to be provided when traffic-free routes cross a road mid-link

10.2.2

Grade-separated crossings will involve either a bridge carrying the traffic-free route over the road or a subway/underpass carrying the route beneath the road.

The design of such structures is discussed in Section 10.4. For the design of signal-controlled and priority crossings, reference should be made to the relevant highway and Urban Traffic Control design guidance.

10.2.3

Where crossings of the public highway are required, the design of these features should be discussed with the Local Highway Authority at the earliest possible opportunity.

This is important where the introduction of traffic signal control may have a wider impact on traffic operation within the surrounding highway network.

10.2.4

Where crossings of the public highway network are required, warning signs advising traffic of a cycle crossing may be warranted. Where required, these signs should be introduced in accordance with the TSRGD.

If the crossing is introduced at a location that has a known road safety issue, or is highlighted as a possible road safety concern through the Road Safety Audit process, then further warning intervention may be required.

These can include features such as cycle-actuated signing that will display a warning message to vehicle traffic once activated by approaching people on bikes.

These types of features are far more costly than traditional signing and would be subject to ongoing maintenance and electrical supply costs.

10.2.5

The alignment of a traffic-free route on the approach to a crossing should be designed to ensure that approaching users slow down naturally, as opposed to having to slow down abruptly for a poorly positioned access control measure.

Designers must aim to reduce the speed of users through a varied path alignment that provides adequate forward visibility to the crossing.

This will enable users to slow down at a rate that is comfortable to them.

Where designers cannot introduce an approach to a crossing that results in the self-management of user speed and behaviour, it may be appropriate to provide warning signs or markings on the traffic-free route to inform users that they are approaching a road crossing.

10.3 Bridges

10.3.1

Many traffic-free routes pass through environments that include a number of physical obstacles including railways, rivers, canals, small watercourses and roads. Bridges can be used to overcome these obstacles and provide high-quality continuous routes for all users.

Similarly, routes are often introduced alongside existing rail corridors, rivers and canals, all of which may have existing bridges passing over them.

Therefore, designers should assess how existing bridges along a proposed traffic-free route will affect the design, or how the introduction of bridges could improve the continuity of a route and level of service.

10.3.2

Bridges are termed ‘overbridge’ or ‘underbridge’. In the context of this guidance, an overbridge provides a means of access over the traffic-free route and an underbridge provides access under the traffic-free route.

The access provided over or under the traffic-free route could form a means of access for vehicle traffic, non-motorised traffic or livestock.

The table below sets out key considerations for each type of bridge.

Key considerations with over and under bridges

10.3.3

It may be useful to adapt existing or disused structures for use as part of a traffic-free route. This may range from simply reopening a closed structure to installing a new bridge deck on existing abutments.

When adapting existing structures, it may not be possible to achieve the geometric design requirements that would be required of a new structure.

However, this need not necessarily preclude the use of the structure, particularly where any risks to users can be mitigated or where there are no other feasible design solutions.

When adapting existing structures, particular attention should be given to potential ecological constraints, as many structures are habitats to a range of protected species, including bats and nesting birds.

Pre-decking condition at Lumb Viaduct, Rossendale, Lancashire.

Lumb Viaduct as a traffic-free route, Rossendale, Lancashire.

10.3.4

The width of a route and type of provision over or under a bridge should be consistent with the adjacent route.

It may be necessary to provide additional width to compensate for any loss of effective width created by parapets (underbridges) or abutments (overbridges).

The significant expense of providing a new bridge means that it is important to ensure that the bridge is designed to accommodate anticipated growth in usage, as the costs associated with future widening of structures are not likely to be viable.

10.3.5

Headroom should be provided as set out in Section 6.2.1. For underbridges, the headroom requirements should be agreed with the relevant Technical Approval Authority

Parapets on a traffic-free route should be 1.4m high, or 1.8m high where equestrian use is expected/provided for.

Where existing structures are adapted, it may not be feasible to provide 1.4m high parapets for technical, planning/conservation or cost reasons.

In these cases, a lower than ideal parapet should be subject to a Designers Risk Assessment.

Depending on the outcomes from any risk assessment, measures implemented to mitigate the hazard associated with lower parapets could include:

- Locating the path away from the parapets, or directing people riding bikes or horses to keep away from the parapets.
- Re-profiling the bridge deck to increase the parapet heights.
- Providing dismounting blocks for people riding horses to dismount.

Many existing structures with lower than standard parapets have been successfully incorporated into routes.

Refer to Sustrans Technical Information Note 30 Parapet Heights on Cycle Routes.

10.3.7

Where new bridges are to be incorporated into a traffic-free route, the design must be undertaken by a suitably qualified engineer and approved by the appropriate Technical Authority.

10.3.8

Bridges may be constructed from a range of materials including concrete, masonry/brickwork, steel, timber or plastic composites.

Material technology is continually developing, making newer, lighter materials technically and financially viable.

The choice of material and form of a bridge can have a significant bearing on aesthetic qualities and whether the bridge becomes a feature on a traffic-free route.

10.4 Subways and Underpasses

10.4.1

Subways and underpasses can provide an alternative means of grade-separation to a bridge.

New subways are unlikely to be feasible due to the cost of excavating beneath an obstacle, compared to building a bridge over the obstacle.

Considerations in the design or adaption of subways and underpasses include the geometry of the access ramps to avoid blind corners, provision of adequate headroom, ensuring the personal safety of users by providing good visibility through a subway, the need for drainage to prevent flooding and the need for lighting.

In a number of European cities, subways are kept at ground level with the road being raised above the walking and cycling route. This approach is often more economical than raising people on bikes over an obstacle on an overbridge.

More specifically, motorised traffic requires more headroom than people on bikes and walkers.

Incorporating subways and underpasses into the traffic-free route can result in smaller structures being required when compared to routing motorised traffic through a subway or underpass.

Subway underneath highway, Southampton.

10.4.2

Benefits of subways/underpasses include:

- Conflict free crossings.
- Avoids exposure to weather.
- More comfortable gradients than bridges and ramps.

10.4.3

Key design features include:

- Subways/underpasses require considerable investment.
- Where there are high user flows, separation should be considered.
- The crossing and its approaches should be straight or nearly straight.
- Where separation is required, a shallow 45o kerb face is normally sufficient.

Key minimum dimensions are outlined in the figures below:

10.4.4

Generous headroom and width will be beneficial in terms of safety, natural surveillance and personal security.

However, where existing structures are being used, headroom may be limited.

In these instances, the restricted headroom should be subject to a Designers Risk Assessment to determine whether the risk to users can be safely mitigated.

One approach to mitigating this risk could be to clearly sign the restricted headroom. However, the Cyclist Dismount sign is not an accepted form of mitigation and should not be used.

10.4.5

Where lighting systems are proposed, these should be vandal proof to ensure that they function when needed by path users, but also to minimise future costs associated with replacement systems.

The design should also consider approaches to minimising the level of artificial lighting intervention.

This can include widening or diverging walls towards the top of the structure or using light wells, both of which will increase the level of natural lighting within the structure.

Uninviting and dark subway, Sharston, Manchester.

10.4.6

Bridges, subways and underpasses can all form habitats for a range of species.

As an example, an unlit subway/underpass may be a roost site or commuting route for wildlife, such as bats, that would otherwise be disturbed should the feature be illuminated throughout the hours of darkness.

As with any design proposal, the introduction of new, or modification of existing, subways and underpasses will require ecological impacts to be assessed at the planning and design stage.

10.4.7

The maintenance requirements of structures can be extensive. And a considerable level of resource is often required to address the outcomes of anti-social behaviour, such as graffiti, broken glass, damaged lights and litter.

These outcomes can be perceived as negative by users of a route, resulting in use being restricted to certain times of day, or alternative routes being sought.

The design of new structures, or modification of existing structures, should consider these outcomes by using an innovative approach towards design.

This could include using lighting systems that are incorporated into the structure and therefore are more difficult to damage, or using graffiti resistant coatings on the structure itself that can be easily cleaned or removed if defaced.

Furthermore, the structure can be designed to ensure that cyclic maintenance is made easier. For example, providing sufficient widths to enable a street sweeper to access the structure.

When designing new or improved structures, it is also important to involve the local community in the process, such as producing artwork for the structure.

10.5 Other structures

10.5.1

There are a number of other types of structure that may form part of a traffic-free route including retaining structures, boardwalks and tunnels.

10.5.2

Retaining structures are often needed to support a new traffic-free route, particularly where embankments are levelled to accommodate a path.

The use of retaining structures can often reduce the amount of land take required, for example, a ramp can be shortened and its gradient increased (within the limits discussed in Section 7.5.1) to reduce its overall footprint, as opposed to having a longer length of ramp that follows the natural contours of the land.

There are a number of options for creating retaining structures, all of which have different characteristics and are suitable for different situations.

As with all structures, a suitably qualified and competent person should design a retaining structure. Types of retaining structure include:

- Timber sleeper and pile walls
- Crib walling.
- Gabion baskets.
- Reinforced earth.
- Brickwork or blockwork.
- Sheet piling.
- Reinforced concrete.
- Paving slabs (suitable for low retained heights).

Concrete crib retaining wall alongside traffic-free route.

Sheet piling used to retain embankment, Millwall Path, London.

10.5.3

Boardwalks and similar elevated structures are often viable solutions within, or through, areas of ecological and environmental sensitivity or within flood plains. Boardwalks can sometimes require parapets to protect users from elevated edges, particularly on busy routes.

Boardwalks can provide access through terrain that would otherwise be impassable to a range of users, as well as providing access where the passage of users would otherwise have a detrimental impact on ecology.

However, when using boardwalks consideration must be given towards the decking material used.

Timber, for example, may result in a slippery surface that requires additional coating/treatment to provide some level of skid resistance for users.

GRP decking may already have a high friction surface on the decking, although this will likely come at a greater cost than timber decking.

Skid-resistant material within timber decking.

10.5.4

Disused tunnels can form a component of traffic-free routes, particularly through areas of challenging terrain where the provision of suitably graded routes would be impractical. Reopening a disused tunnel can be technically challenging and costly.

However, there are a number of examples of where this has been achieved successfully.

Specialist advice should be sought at the earliest possible stage when considering reopening a tunnel.

Lit path in Rodney Street Tunnel, Edinburgh.

10.6 Drainage

10.6.1

Drainage for traffic-free routes should be designed in accordance with sustainable drainage principles.

In most cases, this will be achieved simply through the surface water run-off from the path soaking away into the verge. This would

need to be confirmed through early ground investigation or soakaway testing.

It may be necessary to construct a stone-filled trench to facilitate the soaking away of run-off.

Attention should be given to the detailing of this approach, as it is undesirable to have a stone-filled trench finished with loose stone immediately adjacent to a path as this may present a hazard to people riding bikes.

It may be necessary to cover the stone with a layer of soil laid on a geotextile.

10.6.2

Drainage features can often be used to create interest in the path, both visually and ecologically.

It may be possible to discharge surface water run-off to a shallow scrape or pond.

When creating such features, consideration needs to be given to whether they might create a hazard for path users and how they are going to be maintained.

10.6.3

Positive drainage systems (gullies and pipes) are rarely required on traffic-free routes.

However, where gullies are provided they should be set flush with the final surface level of the path.

Appropriate cycle-friendly gully gratings need to be provided. If slotted gully gratings are used the slots should be aligned at right angles to the direction of travel.

The provision of gullies will also increase the level of maintenance required for a traffic-free route, as they need to be kept clear of debris to function.

Cycle-friendly gully grate.

10.6.4

Within rural settings, it is typical to install pipes at gradients to achieve a minimum velocity of 1 metre per second (m/s).

This will help to aid self-cleaning and reduce maintenance requirements. Furthermore, the provision of 450mm diameter pipe can also facilitate a reduction in maintenance requirements.

10.6.5

The design of a traffic-free route should take account of the existing drainage regime through the site in which it will be introduced.

Any exiting drainage systems and networks must not be disrupted because of new traffic-free routes.

It is not permissible to allow water from a traffic-free route to discharge onto adjacent property without the landowner's consent.

Permission or consent will be required from the relevant drainage authority to discharge surface water into an existing drain or watercourse.

10.6.6

Drainage outfalls can often take the form of shallow scrapes, ponds, existing drainage networks and watercourses.

It is imperative that the local drainage authority is contacted to begin discussions about network capacities where new routes are being constructed. Agreed methods of discharge will need to be discussed in advance of design and construction works.

10.7 Flooding

10.7.1

The flooding of a traffic-free route can have significant impacts on the operation and safety of a route. Inundation of the path can serve to:

- Sever a traffic-free route.
- Cause substantial damage to the composition of the path.
- Exclude certain user groups from the path.
- Lead to serious injury where the alignment of the path cannot be determined.

As traffic-free routes often follow existing watercourses, the risk of flooding should be a significant consideration during the design and planning of a traffic-free route.

Designers must adopt a risk-based approach to this assessment and determine how the route could be affected during certain flood events. Where future flood events are likely to cause safety issues, designers may choose to:

- Abandon the route choice and explore an alternative route that avoids the area of flooding.
- Adopt a more robust path construction specification that is less susceptible to water damage.

- Increase the height of a path to avoid or reduce flooding.
- Temporarily close the path and use diversion routes during flood events.

Designers will need to determine when flooding becomes a safety issue for path users on a case-by-case basis.

This will be informed by factors such as the level and type of usage of the route, the nature of any flooding and the frequency at which flooding will occur.

Where designers determine that flooding can be tolerated, alongside an appropriate mitigation measure, they must also ensure that emergency flood plans and warning systems are incorporated into the design.

10.7.2

Where occasional flooding is expected and a risk assessment has deemed that the risks can be mitigated with diversion routes, and then these must be identified and clearly signed.

Diversion routes must be high quality and accessible to all users of the route.

Care should be taken to not just use the nearest and shortest alternative route as a diversion route.

Example Flood Diversion Signing.

10.7.3

Where a path crosses a river or stream floodplain, raising the level of a path, even by a nominal amount, may be sufficient to ensure that the path remains dry for longer, and as flooding recedes can be used again sooner.

However, raising the level of a path above the surrounding ground level may affect the drainage and flood storage capacity of the wider area.

Therefore, proposals to raise the level of a path by even a small amount should be discussed with the appropriate flood control agency.

10.8 Landscaping

10.8.1

Landscaping can be used to minimise the visual impact of a traffic-free route, particularly in rural and natural environments.

Landscaping can also be used in urban environments to increase interest in a route, particularly where users may be used to an otherwise built-up environment that lacks planting and useable public space.

10.8.2

Planting is one means of improving the visual appearance of a traffic-free route. However, this should be undertaken sensitively and in accordance with advice from an ecologist.

It is also important to consider the maintenance requirements of any planting introduced along a traffic-free route and consider low height/slow-growing plants to maintain sightlines.

Planted separation strip, Warwick Street Park, Newcastle.

10.8.3

Adjacent landowners may be concerned about the impact of a new route and users of the route being able to see into their property.

Earthworks can be used to create privacy banks, shielding adjacent properties from the users of the route.

The nature of the traffic-free route corridor will determine whether there is space available to achieve this.

10.8.4

Where the route corridor is not wide enough to construct privacy banks, a similar effect can be created by lowering the path where the ground profile permits.

When adopting this approach, it is important to firstly consider drainage, but also to consider retaining long open views along the path.

This can be achieved by ensuring that embankments adjacent to the lowered path consist of grassed slopes as opposed to planting.

10.8.5

The alignment of a path close to a highway may result in users of the path encountering traffic noise and poor air quality, which can serve to detract from the enjoyment of the route.

Introducing vegetation alongside traffic-free routes can be effective in shielding a route from excessive traffic noise and improving air quality.

The additional visual benefits of vegetation can serve to improve the overall quality and experience of the route.

Example embankment to restrict traffic noise.

10.8.6

Whist the preference is usually to provide visual separation from an adjacent road to create a more attractive route, there may be cases where it is desirable to maintain a visual relationship between the traffic-free route and the road.

This is particularly relevant in areas with a prevalence of anti-social behaviour, where good levels of natural surveillance are necessary to support personal security.

10.9 Fencing and hedges

10.9.1

Wherever possible, traffic-free routes should be unfenced. This will provide a more open visual aspect, lessen concerns about personal security of path users, and reduce construction and maintenance costs. However, fencing may be required along one or both sides of a route to ensure:

- Safety of path users
- Security of neighbours
- Livestock control.

10.9.2

Fencing or building lines positioned directly along a path edge reduce the effective width of a path and creates an enclosed environment.

Wherever possible, fence lines (over 600mm high) should be set back at least 0.5m from the path edge to minimise the tunnel-like appearance of a path.

10.9.3

Fencing should be as visually unobtrusive as possible. In most cases, 1.2m high fencing is adequate for user safety and livestock

control.

Most route users will be able to see over fencing at this height and the negative aesthetic impact and sense of enclosure will be minimised.

Security fencing and hoarding can serve to create a route that feels enclosed, Bermondsey, London.

10.9.4

Where adjacent landowners require their land to be enclosed, the type of fence should be agreed with them.

Timber post and rail stock-proof fencing are often preferred.

However, timber post and wire fencing with stock-proof mesh may be sufficient for safety or livestock control.

Timber post and wire mesh fencing creates a route that feels open, Glais, Wales.

10.9.5

Security fencing can be unattractive and oppressive, and traffic-free routes through urban areas can quickly become enclosed for considerable distances.

Where adjoining premises require security, weldmesh fencing is a good alternative to palisade fencing. It is largely unclimbable but less visually oppressive.

Weldmesh fencing on the Millwall Path, London.

10.9.6

Traffic-free routes adjacent to railways always require fencing. To maintain the required clearance to the railway line, the fence may need to be closer to the path than is desirable.

In urban areas, palisade fencing is used to prevent access to the railway, although less visually oppressive examples, including weldmesh-type fencing or lower fencing, have successfully been used on routes.

In rural areas, less intrusive fencing such as timber post and wire fencing can provide an aesthetically pleasing environment whilst preventing unwanted access into the rail corridor.

Where routes are located in close proximity to a rail corridor, it is critical that Network Rail is engaged as a key stakeholder at an early design stage.

Through this process, discussions and negotiations can be held to find the most appropriate fencing solutions to address the needs of all stakeholders.

10.9.7

Hedgerows can provide an attractive bounding feature for rural and semi-rural traffic-free routes and can offer protection from wind.

Hedgerows should be set back sufficiently far from the edge of the path to allow for growth of the hedge.

Thorny species such as hawthorn, dog rose or gorse should be avoided due to the increased risk of punctures for people riding bikes.

As with any planting, advice should be sought from an ecologist and future maintenance requirements should be considered, as hedging, in particular, can grow into the path if not tended to, which can result in a reduction in effective width.

Hedge set back from path edge, Grand Union, Leicester.

10.9.8

Where there is a hazard adjacent to a traffic-free route, such as a steep drop or a water feature, the need to provide fencing as edge protection should be considered by the designer, following a risk-based approach.

This assessment should consider factors such as the nature of the hazard, the likelihood of a user leaving the path, whether the fencing presents a different hazard, and what the impact of vandalism might be on the fence.

10.9.9

Where there is a water hazard adjacent to a traffic-free route, the need for fencing will be determined by:

- the velocity of the water
- depth of the watercourse

- the nature of the ground between the path and the water
- the height differential
- the gradient, width and horizontal alignment of the path
- and the nature of the use of the path.

It should be noted that many traffic-free routes have operated alongside water features with no need for fencing. Canal towpaths are rarely fenced off except at discrete locations.

10.10 Artwork and other features

10.10.1

The attractiveness of traffic-free routes can be improved by incorporating interpretive features and artwork.

These features can help create a strong sense of location, creating attractive places that people want to use for walking and cycling.

10.10.2

Interpretation boards can provide users with information about the route or features in the area. This might include local history, ecology to look out for, or other points of interest.

Information board from NCN Route 96, Ballymoney, Northern Ireland.

Information board on The Nickey Line, Hertfordshire.

10.10.3

Art is an important element of placemaking. It can introduce intrigue and make a route worth using just for the opportunity of seeing and experiencing a piece of art.

The most successful public art allows people to interact with it, see through it, sit next to it, use it, and play with it.

Opportunities to develop exciting artworks should be considered as part of the planning of a traffic-free route and could form part of the engagement with the local community.

10.10.4

Seating provides an extra element of comfort to a route and encourages the community to make the place their own, which is

fundamental to help users feel safe. Seating can maximise local activity, allowing people to socialise and to linger.

In some locations, they can be associated with tables or play equipment.

Providing seating can offer an opportunity to make the most of a beautiful view or sunny spot. Consideration should be given to providing seating at regular intervals.

Seating introduced along New Malden Raynes Park Scheme, London.

10.10.5

It is essential to consider the provision of cycle parking where a traffic-free route provides access to a destination.

The design of any cycling parking must consider the space requirements of larger adaptive or utility type bikes, as well as the space requirements of the users of these types of bikes.

Parking provision for adaptive bikes must have step-free access.

There are increasingly creative ways of providing accessible, attractive, convenient and secure parking, which needs to be considered as part of the planning and design of a traffic-free route.

Cycle parking at Hadrian’s Wall Visitor’s Centre.

10.10.6

Traffic-free routes can provide opportunities for local businesses to develop, particularly where there is a high degree of leisure or tourism use on a traffic-free route.

This might include cafés, bike hire and bike repair businesses and even accommodation provision.

10.10.7

Where possible, bike service points can be integrated into a route to allow users to pump tyres or repair a puncture and cause minimal interruption to a journey.

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11. Maintenance and management

Maintenance and management is part of the Sustrans traffic-free routes and greenways design guide. It covers maintenance as part of the design process of a traffic-free route, inspections and the involvement of volunteers as a valuable way of undertaking maintenance activities.

Key principles

- It is important that a traffic-free route be well maintained to encourage and sustain high levels of use.

- Consider maintenance as part of the design process of a traffic-free route.
- Include a maintenance period in construction contracts for new paths.
- Inspections should form a key part of a maintenance regime.
- Involvement of volunteers may be a valuable way of undertaking maintenance activities.

11.1 Designing for maintenance

11.1.1.

Design decisions can have an impact on the level of maintenance that is required through the life of a traffic-free route. Maintenance considerations should be an integral part of the design process. For example:

- Surface type – sealed surfaces cost more to install, but require less maintenance over their lifetime and so have an overall lower 'whole-life' cost.
- Drainage – appropriate design of path alignment and drainage provision can significantly reduce the damage caused by surface water run-off.
- Planting – should be designed to incorporate slow-growing vegetation close to the path.
- Trees – construction of a new route should address trees that are likely to cause problems in the future during construction. This could include removal, or where appropriate, installation of root barriers.
- Ancillary features such as signing and artwork - consideration should be given to how they will be maintained, and whether it is appropriate to provide them at all where there are existing or anticipated anti-social behaviour problems.

11.1.2

The quality of a route and level of maintenance required can be influenced by the construction method. More specifically, undertaking stages of the construction process by hand can lead to a poorer and more inconsistent finish than that produced by mechanical means. This is important when constructing the path surface.

However, using larger equipment can create logistical challenges and so how a route will be constructed needs to be considered as part of the design process. To achieve this, it can be useful to assess construction challenges through design risk workshops. It is important to ensure that someone with experience of the construction of traffic-free routes attends.

11.1.3

Maintenance arrangements should be determined as part of the development of the route. How maintenance will be funded should also be considered through the Scheme Assessment process.

It is suggested that the maintenance liability for a new path should rest with the contractor. The period of responsibility should be defined within the construction contract. This arrangement will serve to encourage the contractor to execute the works to a high standard.

Thus reducing the need for maintenance works during the agreed maintenance period. This approach will also provide enough time for vegetation and planting to become established while the contractor is still involved in the project.

11.2 Maintenance inspections

11.2.1

Traffic-free routes must be subject to routine maintenance inspections. These will serve to monitor the condition of all components of a route. Maintenance inspections should be based around a robust risk-based reporting structure. From this, defects can be prioritised and addressed in a timely manner.

The inspection of trees must be incorporated into any maintenance regime. This will ensure that they do not pose a hazard, or serve to reduce the effective width of a path.

11.2.2

Structures will usually be subject to a separate inspection that is undertaken at greater intervals to that of the routine path inspections. These inspections are likely to focus on structural condition and pay less attention to the wider route environment.

The path surface over or through any structure must still be considered as a part of the routine path inspections.

11.2.3

Features such as artwork, interpretation panels and benches need regular inspection. This will ensure that they are cleaned and repaired quickly after being subjected to damage or graffiti. This approach will also ensure that damaged features do not detract from the attractiveness of the route.

11.3 Maintenance plans

11.3.1

Traffic-free routes should be subject to a Maintenance Plan. This is likely to include activities such as cutting verges, cutting back overhanging vegetation, tree work, path sweeping, drain and ditch clearance and litter picking. Vegetation clearance work should be undertaken outside the bird-nesting season, which in general runs from February to the end of August.

However, this can be subject to change because of seasonal variance from year-to-year. If in doubt, a qualified Ecologist will be able to advise on the most appropriate scheduling of maintenance activities.

Developing a Maintenance Plan during the planning and design stage of a route can assist in determining costs associated with ongoing maintenance, which will be required for the purposes of Scheme Assessment.

11.3.2

Structures, particularly older ones, are likely to require more intensive maintenance. This will normally be dictated by the inspection regime. Smaller bridges on traffic-free routes may have wooden decks with anti-slip treatments.

The condition of any anti-slip treatment must be monitored to ensure that the decks do not become slippery. This is particularly important where a bridge is shaded.

11.3.3

It is also important to ensure that drainage features, such as channels, gullies, ditches and pipes are kept clear of debris and silt. Piped drains may need regular cleaning to ensure they function as designed. Otherwise, the route may become susceptible to flooding.

11.4 Vegetation

11.4.1

A traffic-free route can become unattractive and difficult to use if vegetation is allowed to grow freely. Overgrown vegetation can serve to prevent access for some route users. Particularly those using adaptive bikes.

Maintenance regimes should ensure that vegetation is managed to keep the route clear of encroaching vegetation. This will allow natural light to fall onto the path, and enable attractive plants and flowers to grow. This is important to enhance the ecological value of the route.

Increased path width resulting from cutting back of vegetation.

11.4.2

To keep a route attractive, and maintain good personal security, it is important to keep vegetation cut back. This will prevent a tunnel effect that can be created where trees have encroached into the path envelope.

Vegetation clearance may need specialist equipment and will, therefore, need consideration during the design stage. Particularly if heavy machinery could result in excessive loadings being placed on the path.

11.4.3

Keep vegetation under control so that it does not obstruct the structure. This allows inspectors a clear view of the structure so that they can identify defects. Keeping vegetation cut back also avoids damage to masonry joints and corrosion of painted surfaces.

Vegetation encroachment onto a structure.

11.4.4

Cutting a 1m wide strip of vegetation along the path edge to a length/height of approximately 10-15cm will keep vegetation off the path without injuring amphibians or small mammals living in it.

If notable or rare plant species are known to be present, then the maintenance regime should allow them to set seed before mowing, as this will encourage new plants.

11.5 Maintenance access

11.5.1

The requirements for maintenance access should be considered during the planning and design stage. Access requirements may vary from a small van through to a lighting inspection lorry. Therefore, the design of any access points should take this, as well as the turning requirements of these vehicles, into consideration.

11.5.2

Designs should avoid locking mechanisms where keys could be lost or features that could be vandalised or require additional maintenance. Where vehicle access is necessary, any access point should be set back far enough to allow the largest vehicle to wait off the road safely without the access control being removed/opened.

Where the designer believes access by motor vehicles will be required along the path, then the frequency of visits and subsequent loadings of these vehicles must be considered in the path design. More specifically, the specification of the path may need to be increased to ensure that premature deterioration does not occur because of motor vehicle loading.

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12. Land and legal

Land and legal is part of the Sustrans traffic-free routes and greenways design guide. It covers a number of different ways in which a traffic-free route can be developed, including the acquisition of the land, creation of a Public Right of Way, or a legal arrangement involving the relevant highway or other authority. The legal matters referred to in this section relate only to the legislation that applies in England & Wales.

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This Design Guide is not intended to constitute legal advice. It should not be relied on or treated as a substitute for specific advice from your solicitor.

Key principles

- Creating a traffic-free route will usually require prior agreement with landowners.

- There are a number of different ways in which a traffic-free route can be developed, including the acquisition of the land, creation of a Public Right of Way, or a legal arrangement involving the relevant highway or other authority.
- Prior to approaching landowners, advice should be sought from appropriately qualified professionals at the early stages of development of a route, to determine the legal status of any existing route components and to decide upon the appropriate legal status desired for any proposed new components of a route. E.g. from the relevant highway or other authority, and/or from an appropriately qualified surveyor or lawyer.
- There are legislative differences across the UK, which are relevant to creating routes. Most of the legislation which applies in England also applies in Wales. Separate legislation applies in Northern Ireland and Scotland.
- The legal matters referred to in this section relate only to the legislation that applies in England & Wales. The detailed reference to Rights of Way legislation includes Northern Ireland.

12.1 Overview of land acquisition

12.1.1

Creating a traffic-free route will normally involve negotiation with a number of landowners to reach agreements to acquire the necessary legal rights and/or permissions to enable the subsequent creation of a route.

These rights and/or permissions can be acquired by outright purchase, exchange or gift of land to become the new landowner, or by leasing land from a landowner for a defined number of years, or by licence or permission granted by a landowner for a defined number of years.

Each type of legal transaction or agreement has different characteristics and it is important to understand them. Public Rights of Way may already exist and can also be created by highway and other authorities, using statutory powers. Other arrangements may potentially be feasible, subject to circumstances and requirements.

12.1.2

Landowners may have objections or reservations about the creation of a traffic-free route affecting their land.

These are more likely to be successfully resolved if each landowner is sufficiently engaged with the proposals as early as possible in the design process. A suggested process for engaging with landowners is shown in the figure below:

12.1.3

It is important to seek to acquire sufficient extent of land to enable the future construction and all ongoing maintenance of the proposed traffic-free route by the relevant parties, and without undue constraint being created at the development stage.

It is likely to be much harder to acquire more land at a later stage. It is essential to be aware of any constraints and liabilities that may already exist or which may develop in time, especially if the land is owned outright.

Areas or land acquired may be found surplus to route development requirements, and could be made available to others, potentially to generate funds, or put to good and complementary uses.

12.1.4

It should be noted that each land negotiation would, to varying degrees, be necessarily bespoke and require flexibility in the approach with landowners and councils.

12.2 Public Rights of Way

12.2.1

Public Rights of Way provide legally protected rights to pass and re-pass a route and give the public the opportunity to enjoy the

outdoors. Those public rights cannot be taken away except by operation of law.

In England and Wales, Highway Authorities are (usually County Councils or unitary authorities) required to produce, and keep updated a definitive map and statement showing their Public Rights of Way.

The definitive map and statement held by each Highway Authority should be publicly accessible, either in hard copy or online.

Where an existing Public Right of Way is being improved as part of the development of a route consideration should be given to the Defra Rights of Way Improvement Plan guidelines (Defra, 2002). Paragraph 2.2.21 of these guidelines state:

"There is potential for conflict on ways carrying higher rights between different classes and types of users.

"Wherever possible proposals for improving rights of way should not unduly benefit one class of user at the expense of another. Improvements that are intended to benefit cyclists, harness-horse drivers, horse riders or walkers should not unduly restrict lawful motorised use of public vehicular rights of way."

12.2.2

The matter of Public Rights of Way in Scotland is distinct from that in England, Wales, & Northern Ireland. In Scotland, local authorities, the Scottish Rights of Way and Access Society, the public & landowners are relevant.

Public Rights of Way continue as a separate matter from the much wider rights of access, which were codified in law as one of the three main provisions of the Land Reform (Scotland) Act 2003.

In Northern Ireland, the Access to the Countryside (Northern Ireland) Order 1983 provides that local authorities are responsible for Public Rights of Way.

Each council has a specific duty to assert, protect and keep open any Public Right of Way and to make and preserve maps and other records of the Rights of Way in its area.

The Local Authority must enforce the public’s common law rights of passage, and investigate and record where those rights exist. Local Authorities have a duty to assert, protect and keep open and free from obstruction any Public Right of Way.

The remainder of this Chapter applies only to England, Wales and Northern Ireland.

12.2.3

There are different categories of Public Right of Way as listed below:

Types of Public Rights of Way

Share

12.2.4

Responsibilities for maintenance of Public Rights of Way are apportioned between the Highway Authority and the landowner as listed in the table below:

Maintenance responsibilities

Share

12.2.5

A Highway Authority or other Local Authority through a ‘public path creation agreement’ with the landowner can create public Rights of Way under Section 25 of the Highways Act 1980.

In certain circumstances, Public Rights of Way can also be created through a ‘public path creation order’ made by a Highway Authority, other Local Authority, Strategic Highways Authority or the Secretary of State under Section 26 of the Highways Act 1980.

In both cases, the resulting highway will be maintainable at the public expense. There will need to be a discussion about what type of Public Right of Way should be created (see above).

Alternatively, a landowner may seek to ‘dedicate’ their land for use as a Public Right of Way, either expressly or by presumption or by “deemed dedication” following 20 years’ public use.

Anyone who has evidence that a right of way has come into existence by statute or common law can apply for a Definitive Map Modification Order (DMMO) to have the right of way recorded on the definitive map.

DMMOs are about whether rights already exist, not about whether they should be created or taken away.

12.2.6

To facilitate cycling, it is possible to convert all or part of a public footpath to a cycle track by making a Cycle Tracks Order (CTO) under Section 3 of the Cycle Tracks Act 1984 and the Cycle Tracks Regulations 1984.

On conversion from a public footpath to a cycle track, the cycle track becomes a highway maintainable at public expense, even if the footpath had not previously had that status.

A Local Highway Authority has power to carry out any works necessary for giving effect to a CTO; in so far as the carrying out of any such works, or any change in the use of land resulting from a CTO, constitutes development within the meaning of the Town and Country Planning Act 1990, permission for that development shall be deemed to be granted.

12.2.7

The proposal to convert a public footpath under a CTO may result in objections being raised.

If objections are not withdrawn, a public inquiry may be held which then requires the Secretary of State to confirm the Order, with or without modifications, or reject the Order.

Common sources of objection are landowners, who have to give consent if the footpath crosses agricultural land, and ramblers groups who may object as making the order results in the public footpath being taken off the definitive map.

12.2.8

To overcome the likelihood of objections, it may be possible to create a parallel cycle track through either dividing the footpath width longitudinally and converting half of the width under the Cycle Tracks Act or avoiding a CTO by creating a parallel permissive path for use by people on bikes.

12.2.9

It may be preferable to create a route as a bridleway. This will require provision to be made for people riding horses and may affect the width of the route, surfacing type and parapet height of

bridges.

12.2.10

Agricultural and other motorised vehicles may use byways open to all traffic.

Where there is potential for this to cause conflict, proactive management to deal with the issues can facilitate sharing of the byway by all legitimate users.

‘Making best use of byways’ (Defra, 2005) provides guidance on the management of byways.

Where motor traffic speeds and flows are sufficiently low it can be possible for walkers, cyclists and horse riders to comfortably share a route with people riding or driving motorised vehicles.

This would in effect create a Quiet Lane where typically actual speeds should be under 40mph and motor traffic volume less than 1,000 vehicles per day.

In these situations, it may be appropriate to provide measures to remind all users of the shared nature of the route.

Where motorised vehicles need to be provided for this may require a more robust construction to withstand the greater loading.

12.3 Permissive routes

12.3.1

Where a traffic-free route is not being created as a Public Right of Way, a permissive path can be created with the agreement of the landowner. This is usually necessary when the land is acquired under a lease or a licence.

Landowners may prefer the creation of a permissive path, as no public rights being created allows more flexibility to divert or close the route should circumstances dictate. However, this can give the route less long-term security and vulnerability to closure in the future.

Example permissive path signing.

12.3.2

To prevent a Public Right of Way being claimed through a user, it is essential that appropriate signing, stating that the land or route has not been dedicated as such, is erected and maintained.

This is often a requirement set out in a leasehold or licence agreement.

12.4 Traffic-free routes in parks or along promenades

12.4.1

Byelaws are local laws made by a local council under an enabling power contained in a Public General Act or a Local Act requiring something to be done – or not done – in a specified area.

They are accompanied by some sanction or penalty for their non-observance.

Many parks and other public spaces have byelaws that prohibit cycling, either absolutely or in certain circumstances, and Local or Private Acts of Parliament may restrict use by people on bikes.

If amendment or revocation of an existing byelaw is necessary, this is a legal process that needs to be worked through.

Guidance for councils on making, amending and revoking byelaws can be found on the government website.

Sometimes, however, byelaws do not need amendment or revocation because what is sought falls within the scope of the existing wording. It is therefore advisable to check the wording of a particular byelaw and other legislation carefully and seek legal advice as appropriate.

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13. Planning and consents

Planning and consents is part of the Sustrans traffic-free routes and greenways design guide. It covers planning permission, a number of other typical consents or permissions including ecology and the need for appropriate local and expert advice.

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Key principles

- The development of a new traffic-free route is likely to be considered as ‘development’ and require planning permission. This needs to be factored in as part of the project management of a traffic-free route, particularly in terms of timescale, resources and budget.
- A number of other consents or permissions may also be required to construct a traffic-free route, such as ecological consents.
- Appropriate local and expert advice should always be sought as early as possible, particularly where it is not clear whether

applications for planning permission or other consents are required.

13.1 Planning permission

13.1.1

When a party wishes to make a change to the environment, planners often call it ‘development’, for which planning permission is required in England and Wales under the Town and Country Planning Act 1990 (as amended) (TCPA 1990). ‘Development’ includes both physical changes to land (building, engineering operations etc.) and material changes of use of that land.

There are some limited exceptions to the meaning of ‘development’ set out in section 55 of the TCPA 1990, including some works within the boundaries of a road in certain circumstances.

Some works fall within the scope of ‘permitted’ development as set out in statutory General Permitted Development Orders which also do not require a planning application. This includes some road/highway works in certain circumstances.

13.1.2

Planning decisions are made by the Local Planning Authority (LPA) based on adopted planning policies. Whilst the principles and procedures are similar across the UK, these are based on different legislation in England, Wales, Scotland and Northern Ireland. Each nation has its own Planning Portal, listed in the table below.

Planning portal websites

- England: https://www.planningportal.co.uk
- Wales: https://www.planningportal.co.uk/wales_en
- Scotland: https://www.eplanning.scot
- Northern Ireland: https://www.planningni.gov.uk

13.1.3

LPAs can form a view on whether the express grant of planning permission is required. In general, minor works such as resurfacing within the boundaries of an existing path, would not require a planning application, whereas the creation of an entirely new traffic-free route would.

The majority of minor maintenance tasks, as well as some fencing works, would not require the express grant of permission if the works fell within the scope of ‘permitted development’ rights referred to above.

It is not always clear as to what is, or is not, permitted development, however, so if in doubt advice should be sought from a qualified planning lawyer or planning consultant, or the LPA.

13.1.4

There are certain restrictions on permitted development rights, such as in the case of Environmental Impact Assessment (EIA) development. If there is uncertainty, a certificate of lawful development (LDC) application could be made using the online planning portal.

The process of applying for a LDC is usually quicker than making an application for planning permission. This is because what amounts to 'lawful' development is a legal question, requiring a legal rationale, without consideration of the planning merits.

The grant of a LDC applies only to the lawfulness of development in accordance with planning legislation. It does not remove the need to comply with any other legal requirements, covering relevant heritage, ecology or other environmental issues under, for example, the Planning (Listed Buildings and Conservation Areas) Act 1990 (as amended), the Habitats Regulations or other licensing or permitting regimes.

13.1.5

A planning application may be the only opportunity that the local community has to comment on a proposed development, particularly if a prior exhibition or public meeting has not been held.

Therefore, where necessary, it can be an important process to enable people to air their views for and against a prospective development.

13.1.6

Where a scheme spans the administrative areas of two or more LPAs in England and Wales, the applicant must submit identical applications to those LPAs and the online planning portal can be used to do this. A greater planning fee is payable solely to the authority of whichever area contains the larger, or largest part, of the whole application site.

One of the authorities will normally act as the lead planning authority. Legislation in Scotland is different, so it is advisable to ensure appropriate regulations are followed where two or more LPAs are involved.

13.2 Making a planning application

13.2.1

Anyone can make a planning application in England and Wales on another person's land, so long as the appropriate notices are served on the landowners. Obtaining planning approval for a scheme is a different matter from its implementation, making it possible to obtain planning permission before formal agreement with landowners.

However, submitting a planning application without the agreement of a landowner is not recommended as they may object and even if planning consent is granted, it does not override the need to secure landowner consent for access to the land to carry out the development once permitted.

13.2.2

Planning policy guidance, which is available online, encourages meaningful pre-application discussions with stakeholders, including the local community, statutory bodies such as statutory consultees and local councils/councillors.

It is useful to invite local people to a forum where initial proposals can be discussed and their views recorded. It may be appropriate to enter into (for major development proposals) a Planning Performance Agreement with the LPA and seek advice from the LPA through a formal pre-application submission.

In other circumstances, it may be appropriate to seek advice from the LPA through pre-planning application discussions with, and advice from, planning officers.

This approach would enable the LPA to provide written advice on what documents to submit as part of the planning submission (see further below); any specific issues/areas; and the identification of relevant adopted planning policies that need to be considered or addressed as part of the application.

Whilst this process may incur a fee, it is likely to save time in the end, particularly where there has been little or no prior engagement with the LPA.

In England and Wales, if insufficient information has been submitted as part of the planning application, the LPA will not validate the application until it has been provided. This will lead to delay because a LPA is not required to start determining a planning application until it has been validated.

13.2.3
Information required for a planning submission is listed on the LPA's website as 'validation requirements'. The list is generic however and not all of this information will be relevant to a particular development proposal. In addition to drawings showing the proposal at specified scales, the planning authority will require other information such as:

- Detailed reasons behind and justification of the application (usually in a design and access statement (DAS) incorporating a planning statement).
- An assessment of any impacts on the existing environment (often including a flood risk assessment if the site is within a flood plain or near a river or watercourse, landscape & visual impact

assessment report, archaeology report, tree inspection report etc. depending on the details of the particular route proposal).

- Details of existing site conditions and potential impacts relating to vegetation, wildlife and designated sites (usually including a Preliminary Ecological Assessment (PEA) written by a qualified ecologist and any subsequent survey reports for protected species and habitats, such as SSSIs, SPAs, SACs, ancient woodland and wetlands).
- A plan showing the boundary of the application site and any other information relevant to the application.

This list is not exhaustive. What information needs to be submitted depends on the particular circumstances of each individual case and should be clarified with the LPA in advance of the planning application submission.

13.2.4

The formal planning application should be submitted via the relevant online planning portal, which requires the user to be registered.

It should be noted that the application forms are generic and cover a wide range of developments. Some sections of the standard forms are not therefore relevant and do not need to be completed. The application forms include the necessary certificates to demonstrate that the relevant landowners have been notified, which is mandatory.

13.2.5

Part of the determination of the planning application will involve the LPA consulting with the relevant statutory bodies and giving members of the public opportunity to raise objections or register support.

13.3 Planning conditions

13.3.1
Planning approval is always granted with conditions attached. As a minimum, the conditions will specify the period within which the development needs to start (e.g. commence within 3 years) and adherence to a set of drawings and/or specifications.

In addition, other conditions can be applied requiring samples of materials to be approved, further surveys of wildlife, green travel plans or numerous other aspects relating to the site and impact of the development.

To minimise the number of planning conditions requiring further information attached to a grant of planning permission, it is advisable to submit as much detail as possible as part of the planning application submission itself. This can also be discussed with the LPA in advance.

13.4 Consents

13.4.1

In addition to planning permission, schemes will often require other consents, depending on the sensitivity of the site, the location of the proposals and the work required.

The need for any necessary additional consents should be ascertained by investigation and local enquiries at the earliest possible opportunity. Further advice can be found on the relevant national planning portal websites. Details of typical consents are set out below:

Other consents that may be required

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14. Ecology

Ecology is part of the Sustrans traffic-free routes and greenways design guide. It covers the need to determine the potential ecological impacts of a traffic-free route as early as possible in the development phase and seek professional advice on ecological matters.

Key principles

- The potential ecological impacts of a traffic-free route should be determined as early as possible in the development of a route.
- It is essential to seek professional advice on ecological matters at the earliest possible opportunity in the development of a scheme.

14.1 Ecological impact

14.1.1

Despite the environmental benefits of creating traffic-free routes, their construction can remove natural habitat, often in important locations. If done insensitively this can negatively affect nature conservation. As best practice, the ecological damage caused by construction projects should be minimised, and where practical, ecological enhancements incorporated.

14.1.2

Projects will also need to adhere to policies and legislation relating to designated nature conservation sites, habitats, species and conservation on a landscape scale. Whilst policies are enacted through the planning process, the legislation is statutory and applies at all times, whether or not a project requires planning permission. It is therefore important to seek professional advice on ecological matters at the earliest possible opportunity in the development of a project.

14.1.3

When designing a scheme, the priority should be to avoid any adverse impacts on important ecological features. Where this is not possible, mitigation and compensation measures will be required. The planning submission should set out what the ecological impacts are and how they are going to be reduced and compensated for.

14.1.4

Planning policy also requires ecological enhancements to be proposed as part of new developments wherever practical. These are ecological improvements beyond those required to compensate for damage. For a new traffic-free route this could include:

- Improving the condition of existing habitats along the route in the short-term, or through the adoption of a long-term habitat management plan.
- Creation of new habitats such as hedgerows or wildflower grasslands in the place of habitats with low importance to wildlife conservation.
- Specific measures for important species likely to be present at the site.

14.1.5

Once planning permission has been obtained, a licence will be required to carry out works affecting some species (e.g. bats, badgers and great crested newts) that would otherwise be illegal. To obtain a licence, it will be necessary to demonstrate the need for the development, that no suitable alternatives are available and that the conservation status of the species will be preserved.

14.2 Ecology surveys

14.2.1

The first step in an ecological investigation is likely to be a Preliminary Ecological Appraisal (PEA). This report will identify the possible ecological impacts from the work based on a desk study and a walkover survey.

It is therefore important that the ecologist undertaking this work is aware of all aspects of the proposal including those that might not be immediately obvious. For example, where repairs to structures, lighting, landscaping, level changes, storage areas or additional access points be proposed.

14.2.2

The PEA can be conducted at any time of the year as it identifies basic habitat types only, although spring or summer are the optimal survey times. This report is usually considered valid for approximately two years but must be updated if the scope of the work significantly changes.

The survey will also identify the presence, or potential for invasive species (e.g. Himalayan Balsam, Japanese Knotweed) along the route.

14.2.3

The PEA will make recommendations on the next steps for the project including:

- Further surveys that are necessary to more accurately characterise impacts.
- Measures to avoid/mitigate/compensate likely impacts.
- Requirements for consultation with relevant authorities.

14.2.4

Further surveys or species-specific surveys may be expensive, or could take a long time to complete. They are also time-bound, and can only be conducted at certain times of the year, which varies by species.

If the PEA is completed as early as possible in the design process, then it may be possible to amend the proposals to avoid a predicted impact altogether, thereby removing the need for additional surveys, licences and mitigation.

Avoiding impacts will also minimise the environmental impact and help conserve important natural features. Impacts can be avoided through changing the detailed design of the scheme, through timing of work or through changing the construction methodology.

Example of how to manage a potential ecological impact

A PEA for a new traffic-free route has identified that species-rich grassland with locally important orchids is present. The following steps should be followed to manage the potential impact on this important feature:

1. Avoid: Can the route alignment and works area be adjusted to avoid the grassland altogether?

2. Mitigate: If it cannot be avoided, can the proposal be adjusted to reduce grassland loss or avoid areas with more orchids? Can temporary disturbance be reduced by using protective mats?

3. Compensate: Improve the extent or condition of retained grassland by interventions during construction or the adoption of an appropriate management plan?

4. Offset: If on-site compensation cannot be secured, are there opportunities to contribute to local nature conservation strategies. For example, fund the long-term improvement of grassland condition in a local nature reserve?

5. Enhance: For example, improving the condition or extent of the grassland even though damage to it has been avoided altogether or undertaking habitat improvements beyond what is necessary for compensation for the damage caused.