12 Construction and Maintenance

This chapter[7] deals with the construction, maintenance and management of a pedestrian or cycle facility.

Introduction

Close attention to construction and maintenance standards will ensure that routes used by pedestrians and cyclists are comfortable for all users, including those with mobility, sensory or cognitive impairments, as well as being legal, aesthetically acceptable, easy to maintain and durable.

It is important to consider the full life costs and benefits of a scheme. Certain options may require increased capital expenditure at the outset but may result in lower maintenance and management costs. It is only by considering planning, design and street management as a whole that user needs can best be met. Construction costs for a sealed surface path usually outweigh those of an unsealed path, but this is often false economy once maintenance requirements are included.

On-carriageway cycle routes

The typical choice for the carriageway is an asphalt surface. Asphalt used for roads and paths contain bitumens and aggregates which give a durable, joint-free surface that is relatively straightforward to construct and maintain. Different products are available, each with their own properties. The main variables are the aggregate size, aggregate content, binder content and binder grade, which have an effect on stiffness, resistance to cracking and other physical properties of the asphalt. The smoothness of the riding surface tends to be dictated by the texture depth of the asphalt – the higher the texture depth, the rougher the surface and vice-versa.

Asphalt surface treatments for carriageways generally come in one of two forms:

- HRA, hot-rolled asphalt, with or without precoated chippings, was the UK surface material of choice before the 2000s. Its use has been in decline especially in urban areas due to the positive textured nature of this material, which means it generates more noise than some other treatments. For HRA with pre-coated chippings, hard-stone (often granite) chippings are rolled into the asphalt surface course while it is still hot. They add texture to the surface and therefore increase its skid-resistance properties. The chippings are pre-coated with a binder, which can contain coloured pigment if necessary. They must be hard-wearing but with a high polished stone value (PSV), so that they are durable and do not polish over time. A typical choice for carriageway surfaces would be HRA 35/14 but other carriageway and footway grades exist.
- TSCS, a thin surface coarse system, is often applied to carriageway rather than footway surfaces. It typically uses a 10mm or 14mm aggregate. The advantage of using TSCS is that these materials come in a variety of texture depths and also colours. The use of clear bitumens and coloured aggregates allows these materials to be used as decorative asphalts. Use of such decorative asphalts is not recommended in areas of load unless assurances are sought from material suppliers.

[7] Chapter based on draft Wales Active Travel guidance

Note that proprietary types of TSCS have replaced generic SMA (stone mastic asphalt).

The use of all these materials is described in the European Standard Specification EN13108 and thicknesses should be specified using the British Standard BS594987: 2010, Asphalts for roads and other paved areas – specification for transport, laying compaction and type testing protocols, in conjunction with the local highway authority's design and construction standards. Full guidance on using the British Standards is provided in PD 6691 Guidance on the use of BS EN 13108 Bituminous Mixtures - material specifications (BSI, 2010).

All routes for cyclists should be machine-laid rather than hand-laid, which is less regular. A smooth surface texture significantly reduces the effort needed to cycle, adding to comfort.

Thin Surface Coarse System **Hot Rolled Asphalt**

Modifications to the surface may be required to incorporate cycle lanes, advanced stop lines, or traffic speed control measures (traffic calming). Dimensional tolerances should follow normal highway standards, and when a new on-road cycle route is installed a check should be carried out to confirm that this is the case.

Where kerb re-alignment is needed any new carriageway construction should be to normal highway standards unless there is kerb segregation of the cycle lane, when a lighter construction should be used, although surface quality should still be to highway standards. In the case of carriageway widening this can entail the relaying and/or protection of utilities plant (electricity, gas, water, foul and surface water drainage, telephone, cable TV etc.)

Coloured surfacing

In most situations black bituminous surfacing in conjunction with cycle logos and appropriate lane markings is satisfactory and colour should be used sparingly. Extensive use of coloured surfacing is not recommended for maintenance reasons, and poorly maintained coloured surfacing can pose an additional hazard for cyclists.

Footway construction

Footway construction should be of sufficient depth to withstand the loads likely to be imposed on it.

Consideration should be given to the likelihood of accidental or intentional overrun of a footway by heavy vehicles and the thickness increased accordingly. The construction at vehicle crossovers may need to be thicker than the adjacent lengths of footway depending on the nature of the crossover. Cracking or rutting of surfaces due to overloading can be unsightly, create trip hazards and/or drainage problems. The construction specification for footways, footpaths and cycle tracks is contained in HD39, Tables 3.1 to 3.4.

Footpath construction

Where a footpath is constructed away from the highway consideration should be given at the design stage to the practicalities of constructing the path and in particular access arrangements for construction vehicles. Access points to some paths can be several hundred metres away and may require material to be moved by dumper truck. This might be satisfactory for moving sub base materials, but keeping tarmac hot enough to lay properly may be a concern. Additional access points may need to be constructed, and the path may need to be able to carry plant associated with the works.

Where a footpath also serve as access routes for maintenance vehicles e.g. adjacent to waterways, the surfacing and construction of the path needs to reflect this.

It may also be appropriate to thicken sub base layers, or use geotextile materials if necessary where ground conditions are poor. Where paths use land that is contaminated avoid excavating in these circumstances and lift path levels if areas are unavoidable.

Cycle Track Construction

One of the reasons why some cyclists use the main carriageway in preference to a cycle track alongside the road is that the riding quality of the main road carriageway is better. The riding quality of the cycle track should be at least as good as that of the adjacent road and should be machine laid.

Among the most important considerations in choosing an appropriate surface material are cost (and variation by colour), durability and skid resistance. Polished stone value (PSV) gives a measure of skid resistance. A PSV of 55 is normally acceptable for road skid resistance. Table 10 below shows a comparison of different surface materials and treatments according to these criteria.

Only materials costs are included here. Laying costs can vary considerably depending on the area (m2) and the required traffic management arrangements – difficult and restricted access, in particular, are likely to increase costs. The cost per square metre will also be higher for smaller areas. In each case, more accurate figures should be obtained from suppliers.

Table 10: Surface treatments for cycle routes and indicative costs

Surface Material[1]	Life (years)	Skid resistance (PSV)	Indicative cost per square metre (£)		
			Normal	Red	Blue/Green
6mm asphalt concrete	20	60+	8	12	25
Coloured TSCS, 30-50mm thick	20	55+	-	25+	25+
Block paving	20	55	20-30	20-30	-
Brick paving	20	-	-	20-40	-
Concrete paving flags	10	-	20-30	-	-
Tactile paving	10	-	30-40	-	-
York stone flags	20	-	160	-	-

Surface Material[1]	Life (years)	Skid resistance (PSV)	Indicative cost per square metre (£)		
			Normal	Red	Blue/Green
Granite paving flags	20	-	100	-	-
Thermoplastic High-Friction Surfacing	4-6	70+	13	16	16
Resin High-Friction Surfacing	8-10	70+	15	18	18
Cycle Track Veneer (thermoplastic slurry)	5	55+	8	8	8
Cycle Lane Veneer (polymer binder)	10	55+	10	12	12
Slurry Seal (poor colour and life)	5	55			
Surface Dressing – Granite Stone (bituminous binder)	20	60+			
Surface Dressing – Granite Stone (clear binder colour enhance)	20	60+			
Surface Dressing – Pea Shingle Stone	20	50			

The preferred surfacing is machine laid bituminous material, although bound or unbound aggregate, concrete or stone flags or paving blocks are sometimes used. Unbound aggregate surfaces are generally unsuitable in an urban / urban fringe environment as they cause excessive dust in dry weather and can be susceptible to ponding and become muddy in wet weather, leading to rapid deterioration. This also makes them unsuitable for regular commuting cyclists due to repeated dirt and damage to clothing and machinery.

Generally paving blocks and concrete or stone flags will provide a more aesthetically attractive finish and are more suited to high quality public realm areas, but are less comfortable to cycle on and more expensive to maintain.

There may be local sensitivities around surfacing of paths with black bituminous material in areas of high heritage value or green spaces and these should be considered and addressed as part of the consultation; however in reality there is often little argument once a path is finished and open. If necessary, paths can be surface dressed with appropriate materials.

Tactile paving

Tactile paving is provided on walking routes to assist visually impaired people in moving around an area and on segregated shared-use routes to enable them to navigate safely, preventing them from walking into the cycle track inadvertently. Types of tactile paving used and their typical uses are listed below in Table 11. The most common form of tactile paving provided in association with walking routes is blister type tactile paving at road crossings.

Table 11: Common Tactile Paving Types for Pedestrian and Cycle Areas

Type of tactile paving	Typical usage	Typical example
Blister (red coloured)	Signalised pedestrian crossing facilities, including zebra and toucan crossings	
Blister (buff coloured)	Uncontrolled pedestrian crossing facilities	
Corduroy	Where a footway joins a shared use path, top and bottom of steps or other hazard	
Ladder/tramline	Start, end and repeater indication of segregated footway/cycleway (ladder on footway side and tramline on cycleway side)	

Guidance on the provision of tactile paving is set out in the Department of Transport publication 'Guidance on the Use of Tactile Paving' and 'Inclusive Mobility' on the use of tactile paving surfaces' and reference should be made to that document when specifying tactile paving.

Current national guidance covers simple layouts but does not give detail for the wide variety of layouts that are encountered in reality. For non-standard layouts engineers need to apply

the principles contained in the guidance and consult with local groups representing the visually impaired during the design process.

Kerbs, edgings and verges

Footways may require some form of edge restraint in order to maintain their structural integrity. Where a footway is not adjacent to a wall or building this can be provided by an edging strip. Edgings are generally formed from precast concrete units. Any edge treatment will increase the overall cost - pre-cast concrete kerbing roughly doubles the cost of a path.

Where a footway is provided adjacent to a road the footway will normally be delineated from the adjacent carriageway with a kerb. This offers a degree of protection to pedestrians and can assist blind or partially-sighted pedestrians identify the edge of the footway.

In low vehicle speed environments where a 'shared space' is being created it may be appropriate to omit the kerb. In these cases the impact of not providing a kerb on blind or partially-sighted users should be considered with appropriate use of tactile paving, or a low kerb upstand be retained.

Kerb heights should be as set out in Table 11 below.

Table 12: Kerb Heights

Location	Upstand	Typical example
General	75mm to 125mm Half battered profile adjacent to footway Splayed (45°) where no adjacent footway and on high speed roads	
Pedestrian or cyclist crossing	Flush with tactile paving Any upstand makes it more difficult for wheelchair users	

Vehicle crossover	25mm To maintain continuity of edge of carriageway drainage and provide a continuation of the line for blind or partially-sighted pedestrians.	

Away from the carriageway edgings are generally formed from precast concrete units but in rural or more lightly used situations timber edges can be used. However, in many locations away from the highway an alternative to kerb edgings is to construct the sub-base and binder course 300mm wider than the path, providing a 150mm shoulder on either side to support the path.

Where a footway or cycle track is provided adjacent to a higher speed, or more heavily trafficked road the footway should be separated from the adjacent carriageway by a verge, typically at least 1m in width, in order to provide a margin between the active travel path and vehicular traffic. In most cases this margin is likely to be grassed.

A verge of between 0.5m and 1m should be maintained each side of an off carriageway route, as mown edges prevent the vegetation encroaching onto the useable width of the path. The remainder of the verge may be left and can be of value to wildlife.

Drainage

Standing water and poorly-designed surface water run-off can cause problems for pedestrians and cyclists users and seriously damage pavement construction. Keeping water off and moving it away from a carriageway or path will increase the longevity of the pavement structure and increase its use. Any drainage system needs to be efficient and reliable and may need to extend beyond the immediate edges of a new path to be effective.

Where water comes from and how it is disposed of needs proper consideration. It is important to include proper drainage within a design. Poor drainage can give an impression of a forgotten route and lead to a host of other problems.

On carriageway drainage

When cyclists are on carriageways, attention will need to be paid to gully location and levels, which are critical for cyclists as well as ensuring good route drainage. This is particularly important where full or light segregation for cycling has been introduced, since cyclists will find it difficult to avoid gullies. Acceptable gully characteristics are as follows:

- In any location where there is a possibility that cycle wheels will cross gullies, the grate slots should be at right angles to the direction of travel. Alternatively, non-slot ‘pedestrian style’ gratings should be provided.
- no gaps between the frame and cover wider than 15 mm
- recessed gully frames raised to be flush (tolerance +/- 5mm) with the surface
- suitable for their location to take public highway loadings

- open in a manner suitable to be cleansed by a normal gulley cleansing or jetting machine under the relevant highway authority contract

Dished and other gratings unsuitable for cycling across should be replaced. Side-entry gullies or perforated kerb type gullies (e.g. Beany Blocks) may be suitable in some circumstances, particularly where there is restricted width and where cyclists will be close to the kerb.

Fully segregated cycle tracks and hybrid lanes will need additional gullies as well as appropriate falls to facilitate run-off. A minimum grating size of 300 x 300mm is recommended, as the smaller size gully gratings that are sometimes used in off-carriageway situations tend to get blocked.

A gully should be provided in the carriageway at the upper side of any pedestrian / cycle crossing in order to prevent surface water running across the point at which people step into the carriageway

Off-Carriageway Routes

Where new routes are being provided, or widened into soft verges consideration should be given to the effects of any increase in the volume of surface water run-off contributing to the existing drainage system. Once taken off the path surface it is essential that water is returned back into the system at a suitable location. This requires careful thought and understanding. Simply diverting over land run off, or removal of flood water into the nearest ditch or culvert may create problems further downstream.

To prevent ponding of surface water, or the formation of ice, a crossfall or camber should be provided on the carriageway or path surface within the limits stated in Table 10.5 below. Excessive crossfall is uncomfortable to walk on and can cause difficulties for wheelchairs, pushchairs and cyclists.

Table 12: Crossfalls

	Crossfall (%)
Minimum	1.5
Preferred	2 – 3.3
Maximum (at crossings)	7

The direction of the crossfall should be set so that surface water does not run-off onto adjacent property where there is no highway drainage along the boundary. Typically footways will fall towards the adjacent carriageway. On cycle tracks the crossfall should generally fall towards the inside of a bend.

Where it is not possible to provide a continuous crossfall across a path, either due to the relative levels between the kerb and the back of the path or the width of the path, it will be necessary to provide drainage channels within the path. Table 13 sets out four options.

Table 13: Drainage Channels on Paths

Measure	**Advantages**	**Disadvantages**	**Typical example**

Dished channel blocks	Easy to maintain	Trip hazard Requires gullies Can result in ponding water Not suitable on cycle routes	
Flat channel blocks	No trip hazard Easy to maintain	Less capacity Requires gullies Can result in ponding water	
Linear channel with gratings	Can avoid having to create a low spot in a surface	Prone to blocking and silting up Gratings can work loose and cause trip hazards	
Linear slot drain	Visually un-intrusive Can have high capacity (in pipe below ground)	Prone to blocking and silting up Have to be jetted or rodded to be cleaned	

If gullies or gratings are used as part of a path drainage system a heel proof grating should be specified.

Access Controls

Access Controls are sometimes placed on off-carriageway routes to prevent access being gained by unauthorised vehicles, particularly motorcycles.

It is recommended that designers should start with a presumption against the use of any form of access control, as these cause difficulties to many legitimate users and are often ineffective in addressing the issues they are intended to address. In particular, restrictive access controls:

- are inconvenient, can be unsightly and can actively discriminate against some user groups who have legitimate rights to use a path.
- extend the journey time for cyclists and so reduce the utility of a cycle route
- add another level of cost, and maintenance concern, to a path.
- are frequently ineffective because fencing along a traffic free corridor is missing, broken or subsequently vandalised so that the access control can be bypassed.

There is also a tendency to install access barriers to stop, or slow, cyclists at the end of a path for safety reasons – whether actual, or perceived. This is often inappropriate, and designers fail to consider other solutions, such as clear signing and (if necessary) other means of slowing cyclists such as changing path geometry.

A single bollard, and clear sight lines will be effective in many locations. Double rows of bollards, with a spacing of between 1.20 – 1.50m can reduce cycle speeds and prevent motor cycle / car access, whilst retaining better permeability for users than chicane barriers.

Access Control using bollards, Weymouth

Sustrans' document "A guide to controlling access on paths" provides detailed information on assessing whether an access control is needed, and if so the most appropriate design solutions. It covers:

- Legal issues, including the Equalities Act
- Whether an access control is required
- Alternative measures to control access
- Risk assessment
- Deciding on type of access control required
- Design parameters
- Layout and design solutions

Fencing and Hedgerows

Fencing may be required along off-highway paths for the safety of users, the security of neighbours and livestock control. Where needed fencing should remain visually unobtrusive.

The installation of fencing has an impact upon all route users, but greater impact upon cyclists as a fence immediately adjacent to the path edge reduces the effective path width by 500mm.

Fencelines set 1.0m away from a path edge will generate a better visual aspect, and where required on both sides of a path reduce the "tunnel effect". Verges will allow space for drainage, and if necessary ducting for lighting.

Security fencing can be harsh and oppressive, creating environments that are visually off putting to pedestrians and cyclists alike.

Under most circumstances 1.5m high fencing is, or should be, adequate in all but exceptional circumstances. To a pedestrian they still provide views over, and the visual and aesthetic impact upon a traffic free route is considerably less.

Hedgerows form part of the immediate environment for many paths away from or alongside the road. Developing routes that include at least one hedgerow as a boundary feature can re-invigorate them as dead wood, brambles and unwanted species are removed and new growth encouraged. Thorny species such as Hawthorn or Dog Rose should be avoided where necessary, but if used will require planting further back from the path edge to prevent hedge clippings causing punctures.

Lighting

If walking and cycling are to play an important role as an alternative to the car for short journeys they must be promoted as around-the-clock means of transport, rather than just a daylight activity. Many walk and cycle journeys will be made after dark, especially during the winter months, and routes should normally be lit to provide an adequate level of safety, both real and perceived. The benefits of lighting a walking or cycling route include enabling users to:

- Orientate themselves and navigate the route ahead
- Identify other users ahead
- Detect potential hazards
- Discourage crime and increase a sense of personal security

It is important that the provision of lighting is considered at an early stage in the design process, so that the issues can be properly considered and the needs of users taken fully into account in the choice of equipment and the design of the scheme.

Routes along urban and many rural highways will be lit by the existing highway lighting but specific lighting will be needed for off-highway routes. However, in lighting such routes consideration also needs to be given to wider factors, including:

- Limiting levels of light pollution
- Level of ambient brightness in the surrounding area
- The visual impact of the lighting equipment
- Intrusion on nearby properties
- The needs of visually impaired users for uniform illumination at surface level
- Vandalism issues

- Proximity of electricity supply
- Energy usage and cost
- Costs of installation, operation and maintenance

Further information is available in Sustrans Technical Information Note 12 Lighting of Cycle Paths, 2012.

Maintenance and Management - Introduction

Maintenance of the path or carriageway surface is of great importance to pedestrians and cyclists, including proper reinstatement following works by statutory undertakers. For routes away from the highway it is essential to establish responsibility for maintenance of the path, and put into place a regular regime for visits and minor works.

A route that is kept in good condition will be more useful, attractive and popular than one allowed to deteriorate. Maintenance needs to be well planned as, having invested time and money by building the route, it is important that it remains attractive to users.

Programmed maintenance of the wider highway network can offer opportunities to enhance the network of walking/cycling routes if properly planned – see Chapter 9.

Walking and riding quality should be maintained, particularly keeping routes clean and ice free in autumn and winter.

Designing with maintenance in mind

Maintenance should be considered as part of the route development process long before construction starts. A thoughtful design will mean less maintenance in the future. For example an off-highway path surfaced with bituminous material will have a long life needing little maintenance.

The future maintenance burden, both financial and operational, on local highway authorities for any new cycling and walking infrastructure should be a major consideration for designers and it is recommended that both a Value Engineering and Future Maintenance Audit are carried out on all proposed designs before implementation.

It is particularly important to think about maintenance at the start of the design process if the project has capital funding available but maintenance will have to come from existing budgets. Sometimes money can be put aside from the capital source into a separate fund for future maintenance. Irrespective of what the ultimate arrangement will be, it is essential that the design team has agreed the future maintenance arrangements early in the scheme's development.

Maintenance Responsibilities

As noted in Chapter 2, most active travel routes will almost certainly be highways under the definition of the Act (a highway being a route that the public has the right to pass and re-pass), but this does not mean that the highway authority is responsible for their maintenance. Where the route is on the road it will usually be the responsibility of the highways department but some routes may well be the responsibility of another part(s) of the council – for example the education department if the route is through school playing fields.

Every department with future responsibility for the maintenance of the route needs to accept those responsibilities at the outset of the project and allow for them in future budgeting.

Many local parks and former railway greenways have local volunteer groups supplementing the staff carrying out the bigger maintenance tasks. They provide a hugely valuable role, ensuring the local community is involved in its local path and promoting its use, while carrying out smaller maintenance tasks.

General Maintenance Tasks

Each Local Highway Authority will have its own defect intervention criteria as part of the 'well maintained highways' process and established safety inspection regimes based on the hierarchical status and functionality of each asset.

The following list, though not exhaustive, gives some indication on the type of defects that affect walking and cycling network safety and serviceability.

Carriageway, Footway and Cycleway surface defects.

- Broken/uneven riding or walking surface with defects meeting or exceeding applied intervention criteria.
- Worn riding or walking surface with suspect skid resistance - where appropriate, testing of the surface should be carried out to ensure adequate skid resistance for traffic expected to use it
- Defective kerbs, edging and channels

On the parts of the cycle network that run within the carriageway any maintenance inspection regime of road surfaces should ensure that the area of the road which cyclists will most probably use (up to 2m from the kerb) receives a closer examination, with hazards in those locations receiving priority attention.

Drainage and utility covers maintenance

- Missing or damaged inspection or drainage covers and frames
- Surface water flooding or severe standing water
- Blocked surface water gullies and drainage systems

Ironworks, such as drainage gullies and utility covers, are particularly hazardous for cyclists, being both slippery in wet conditions, and often associated with potholes which form around their edges. Where cycle routes are located on roads shared with traffic, such surface defects can lead to greater conflict, with people on bikes often having to make often risky manoeuvres..

Guardrail, fencing and restraint systems

Missing or damaged posts, rails or barrier likely to cause a potential danger or render system ineffective

Signage, Road Studs and Markings

- Missing, damaged or illegible sign faces.
- Damaged post or fixings
- Insufficient headroom from underside of sign
- Insufficient offset from trafficked areas

- Post/ sign obstruction to passage or visibility
- Loose sign brackets resulting in turned sign face
- Missing or damaged road studs
- Missing , faded, worn or incomplete markings

Streetlighting, Traffic Systems, pedestrian and cycle crossings

- Daytime lamp burn
- Lamp out
- Damage, corrosion to columns or posts
- Damaged/turned heads or lanterns
- Missing/loose access doors to columns or cabinet
- Missing / damaged tactile paving at crossing
- Missing / damaged tactile rotating cone on crossing

Verge, Trees and Hedges

- Obstructed visibility or physical obstruction to free passage by vegetation, particularly at junctions and crossing points; cuttings to be kept clear of path surface.
- Root heave to surrounding walking or cycling surface
- Obvious damage, disease or poor condition of any tree within falling distance of the route
- Need for periodic cutting back of adjacent grass verges or banks to maintain full width of asset

Cleanliness and Weed Growth

- Unacceptable levels of leaf litter likely to cause drainage or safety issues for users
- Unacceptable levels of litter, detritus or dog fouling
- Sign face cleansing
- Unacceptable levels of weed growth
- Presence of Noxious weed growth
- Programmed cleansing of litter/dog fouling bins

A poorly cleansed surface, apart from discouraging users, can present real dangers to the user. Bypasses and gaps for cyclists do not benefit from the movement of motor traffic to push debris out of the way, so these need to be of sufficient width for street sweepers and regularly swept if they are to be usable.

Broken glass is one of the more obvious dangers to both cyclists and walkers. However, excessive leaf litter or detritus build up can cause potential slip hazards and impact on the efficiency of surface water drainage infrastructure.

Often more of an issue on off road infrastructure, failure to control weed growth can have a detrimental effect of the safety and serviceability of an asset as well as its attractiveness to users.

If litter bins are provided within the design, there must be a commitment to their regular cleansing. However, the maintenance of litter bins is a considerable burden on Local Highway Authorities, especially on rural routes.

Maintaining Routes Through Roadworks

Roadworks should provide suitable provision for pedestrians, particularly disabled people and cyclists – and without cyclists needing to dismount. Equipment located on the footway must be fenced off and the accessibility of the route maintained for all types of user, with signed diversion routes where necessary.

TROs may be used to place temporary traffic restrictions on roads during construction in order to enable the works to proceed safely, such as making a route one way.

Temporary contraflow cycle lane during roadworks, London

DfT Safety at Street Works and Road Works states that:

> *"If your work is going to obstruct a footway or part of a footway, you must provide a safe route for pedestrians that should include access to adjacent buildings, properties and public areas where necessary. This route must consider the needs of those with small children, pushchairs and those with reduced mobility, including visually impaired people and people using wheelchairs or mobility scooters. You should always try to enable pedestrians to remain safely on the footway if at all possible." (p28 DfT, 2013)*

Chapter 8 of the Traffic Signs Manual states that:

> *"O3.14.6 Where there is cycle provision, such as cycle lanes or tracks, efforts should be made to keep these open or to provide an acceptable alternative during the road works. They should not be blocked by signs, debris, plant etc."*

Road works and any unavoidable consequential route changes must be clearly signed and promoted. Where route changes are planned the Local Authority must raise awareness in the local community and at key facilities or destinations served by the route. This must include using local radio, talking newspapers, and informing disability groups.

Bridges and other structures

Bridges usually have a separate inspection and management system from the rest of the highway and traffic free networks. Bridge owners such as local councils and Network Rail have sophisticated bridge management systems. These tend to focus on the structural condition of the bridge and can pay less attention to the environment of the bridge. Thus

graffiti can remain indefinitely unless reported to the council, making the whole environment feel uncared for and potentially threatening for walkers and cyclists. Underpasses provided for pedestrians and cyclists to avoid busy roads are particularly vulnerable to this type of abuse making their use at best an off-putting and sometimes frightening experience.

Smaller bridges in parks and similar traffic-free environments sometimes have wooden decks. Unless these are treated with a good antiskid surfacing material at the time of construction they can become very slippery when wet. Once again, by considering the maintenance problems at the design stage, potential problems can be avoided before they become significant.

It is important to keep trees and bushes cut back close to bridges to allow inspectors a clear view of the structure and to avoid damage to by those trees and bushes which can cause masonry to crack and painted surfaces to corrode.

Winter Maintenance

Local Highway Authorities in Wales are under a duty to ensure, so far as reasonably practicable, that safe passage along a highway is not endangered by snow or ice.

Whilst this is not an absolute duty due to the qualification of 'reasonable practicality', the Active Travel Act raises the priority of walking and cycling routes and this should be reflected in local authorities' winter maintenance programmes.

It is not reasonable, due to the scale and cost to expect Local Highway Authorities to apply this service to all of the highway network or ensure that treated sections of the network remain ice or snow free. However, well used walking and cycling routes should merit a high priority.

It is therefore recommended that the authority:

- Undertakes risk assessments of which parts of the cycling and walking network should be identified for treatment in Winter Service Plans
- Engage cycling and walking stakeholders and users in the development of policies, winter service and operational Plans
- Advise and inform walking and cycling network users and stakeholders on the extent of the service and safe use during these periods

Highway Enforcement and Custodianship

Although not strictly a maintenance function, Local Highway Authorities also have a duty to assert and protect the rights of the public to the use and enjoyment of any highway, including active travel routes.

The following list, though not exhaustive, shows typical enforcement or controlling actions that may need to be taken to meet the needs of users and ensure compliance with statutory duties in relation to walking and cycling. All the following have potential to cause unnecessary obstruction or potentially unsafe conditions for both cyclists and walkers, and should be addressed by the local authority or police, as appropriate.

- Placing of builders skips within the highway
- Placing of building materials within the highway
- Scaffolding within the highway
- A boards placed within the highway

- Displaying of goods for sale within the highway
- Parking on the footway and across dropped kerbs
- Parking of trailers or caravans so as to cause obstruction
- Illegal signage within the highway
- Cutting back of privately owned vegetation encroaching on the highway
- Mud etc deposited on the highway
- Control of statutory undertakers and maintenance works