The Management of Roadside Verges in Devon

Environment, Economy
and Culture Directorate

The Management Of Roadside Verges In Devon

A summary of the policies adopted by Devon County Council following original recommendations made by a Working Party appointed to look into all aspects of the treatment and maintenance of urban and rural roadside verges and subsequent operational experience.

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How To Obtain Copies Of This Publication And Further Information

Copies of this booklet are available from the Environment, Economy and Culture Directorate, County Hall, Exeter, EX2 4QW and would be of interest to all organisations and individuals who are concerned with, or interested in, the management and conservation of urban and rural roadside verges in Devon.

It can also be found on the Council's web site at www.devon.gov.uk.

Further information may be obtained from the relevant Area Highway Management Officer as listed at the back of this booklet, or by contacting the Environment, Economy and Culture Directorate, County Hall, Exeter.
Telephone: (01392) 382847.

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1. Preface

(i) Introduction

The highway network is vital to the people of Devon as travel is an integral part of the life of each individual and the local economy. The importance of an efficient highway network can be gauged by the disruption to all facets of life experienced when extremes of weather render parts of the roads system impassable.

Devon's environment is of the highest quality with over half of its land and coastline protected as designated areas. Its environmental capital includes:

- Part of a World Heritage Site.
- More than 200 Sites of Special Scientific Interest.
- 2 National Parks.
- 1,132 square kilometres of Areas of Outstanding Natural Beauty.
- Areas of Great Landscape Value.
- Over 18,000 Listed Buildings
- 280 Conservation Areas.
- 3,722 Scheduled Ancient Monuments

During the 1970s the County Council introduced a policy to conserve flora and fauna on roadside verges whilst not jeopardising road safety. This seventh edition of the policy booklet further develops this, whilst working for two of the County Council's primary goals - a safer Devon and safeguarding the environment, heritage and culture. Detailed liaison continues with local conservation bodies to incorporate new ideas and amendments as appropriate.

This approach also concords with the recommendations contained in the National Code of Practice "Well Maintained Highways". (R 15.8)

With ever increasing demands being made on the highway network it is important that effective management techniques are employed to preserve and enhance the environment and to ensure the safe and convenient movement of the travelling public. Managing the highway network to provide Best Value for the people of Devon is paramount to achieving the overall aims of the County Council.

The County Council assesses all types of highway maintenance work in accordance with its Environmental Audit Procedures. This includes the programme's impact on waste, noise and air quality as well as the historic and natural environments and takes account of the Biodiversity Action Plan.

Devon's Best Value Review of Highway Maintenance commenced in November 2001 and extensive consultation with users indicated a general satisfaction with verge maintenance and weed treatment. However, concern was expressed by some parish councils with hedge cutting and the Council's objectives and procedures have been further clarified in this document.

Further information on the Councils objectives and general highway maintenance within Devon can be found in Devon County Council's Highway Maintenance Strategic Plan.

(ii) Devon's Road Network

The County Council has an extensive highway network comprising 12,780 kilometres of road and 5,700 kilometres of public rights of way. There is a duty to maintain this infrastructure to

permit the safe passage of all road users commensurate with use. Included in this length of highway are 3,000 bridges and 9,000 culverts and retaining walls. The major routes in Devon are depicted in Figure 1.1.

Figure 1.1 - Devon's Road Network

Devon's network excludes roads within the City of Plymouth and the Borough of Torbay; and Motorways and Trunk Roads, which are the responsibility of the Highways Agency [see Figure 1.2]

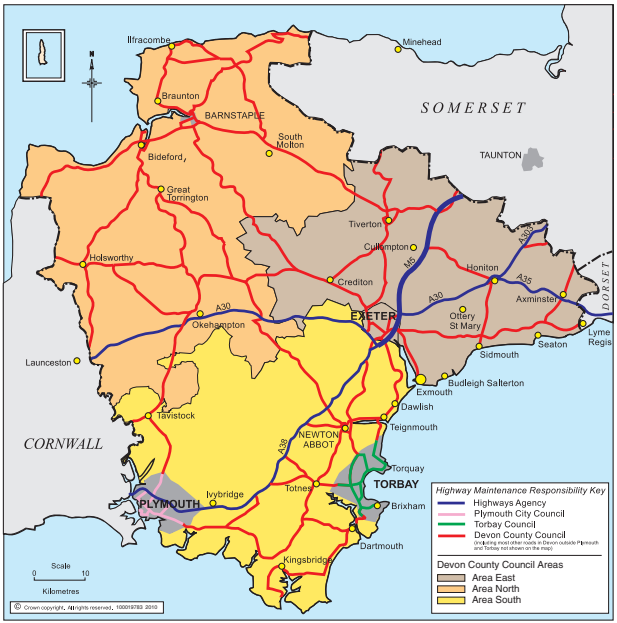


Figure 1.2 Area Structure

(iii) Road Maintenance Categories

Much of the Devon Road Network (DRN) has a road structure totally unsuited to the weight and volumes of traffic now carried and there is a continuing problem in keeping pace with deterioration on all classes of road. To address the difficulties in an objective way the County Council has adopted the principle that standards of maintenance should have regard to the volume and type of traffic using particular roads, and has assigned maintenance categories accordingly.

Road Maintenance Categories that appear in the text of this booklet are defined in table 1.1 below: -

Devon Road Network Maintenance Category		Function	
		Rural	**Urban**
1.	Motorway National	*Responsibility of the Highways Agency*	*Responsibility of the Highways Agency*
2.	Primary National (Trunk)	*Responsibility of the Highways Agency*	*Responsibility of the Highways Agency*
3.	Primary National (County)	National strategic routes for through and long distance travel.	
4.	Primary County	Main County routes connecting principal settlements.	
5.	Secondary County	Main access routes to large settlements and recreational areas.	
6.	Local Distributor	Access routes to smaller settlements and recreational attractions.	
7.	Collector Road	Access routes to small villages and other significant generators	Industrial main collector roads - through routes. *Residential collector roads. Access to schools, hospital, facilities for the disabled, main shopping areas, libraries, car parks and tourist attractions. Heavy pedestrians shared surfaces.

Devon Road Network Maintenance Category		Function	
		Rural	Urban
8.	Collector Road Minor	Local roads serving small hamlets and scattered communities	*Standard collection to other shopping areas, business premises, industrial areas and residential areas.
9.	Service Road	Local roads serving a few properties	*Standard access including narrow collector roads and shared surfaces.
10.	Service Road Minor	Local roads serving only one property	Cul de sac serving less than 20 properties
11.	Minor Lane	Serving fields only or duplicating other routes	Back Lanes
12.	Track	Not used by normal vehicular traffic	
13.	Byway (PROW)		
14.	Bridleway (PROW)		
15.	Footpath (PROW)		
17.	Private Road		

PROW = Public right of way.
** = as defined in the "Highways in Residential and Commercial Estates" guide*

Table 1.1 Road Maintenance Categories.

(iv) Organising the Maintenance Work

The maintenance service is based upon three areas. The local Areas are shown in Figure 1.3, with the length of highway for which they are responsible.

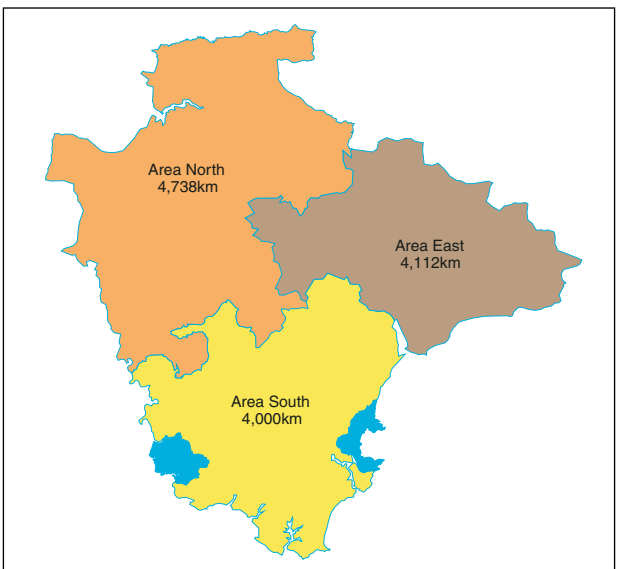


Figure 1.3 Area Office Boundaries and Carriageway Lengths

(v) Limit of the Public Highway

The limit of the public highway for maintenance purposes in rural areas is generally between the boundary hedges or fences (see Appendix F).

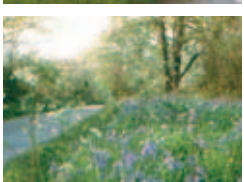
2. Objectives

The Devon County Council Highway Maintenance Strategic Plan includes the following objectives, which forms the basis of the guidelines for the Management of Urban and Rural Roadside Verges in Devon.

(i) Grass Cutting - Statement of Objectives:

The control of growth on the highway verge is necessary for the following safety and environmental reasons:

- to maintain visibility splays for highway users;
- to obviate any fire risk;
- to control brushwood/scrub;
- to control harmful weeds;
- to facilitate maintenance works including ditch cleaning etc;
- cutting around structures etc to allow their correct functioning;
- to provide a refuge for pedestrians/equestrians where no footway exists;
- cutting around street furniture to provide forward visibility to signs etc.



Cutting is limited to achieving these objectives whilst not jeopardising the interests of wildlife.

(ii) Weed Control/Clearance - Statement of Objectives:

- to eliminate weeds on hard areas such as carriageways and footways (including growth around posts and other street furniture) to prevent damage to the structure or surface;

- to control harmful weeds in areas of highway responsibility (Common Ragwort, Broad Leaved Dock, Curled Dock, Creeping Thistle, Spear Thistle, Wild Oats, Japanese Knotweed, Giant Hogweed);
- to eliminate weeds in drainage systems.

(iii) Hedge and Tree Maintenance - Statement of Objectives

- to maintain visibility splays for highway users;
- to prevent the obstruction of carriageways, cycleways and footways;
- to permit forward visibility to signs;
- to maintain and provide correct aftercare to trees, hedges or shrubs planted within the highway by the County Council;
- to permit others to plant trees, hedges or shrubs within the highway where appropriate;
- to encourage landowners/occupiers to cut highway hedges sensitively where highway safety is not affected;
- to facilitate maintenance works.

(iv) Highway Safety Reaction & Clearance of Debris - Statement of Objectives:

Whilst the Environmental Protection Act gives the general responsibility for highway sweeping and litter clearance to the District, City or Borough Councils (including the removal of dead animals and abandoned vehicles), the County Council still retains certain duties relating to road safety:

- to remove obstructions from the highway posing an immediate hazard to road users;
- to remove spilled or excess material from the carriageway, cycleway or footway that is posing a potential skidding hazard to road users or obscuring essential road markings;
- to remove material that is compromising maintenance systems;

- to remove leaf fall at locations where this is exceptionally heavy resulting in a serious road safety problem.

(v) Road Cleaning & Clearing of Ditches, Buddleholes & Easements, & Verge Structural Maintenance - Statement of Objectives:

- to prevent flooding, ponding and seepage; and keep the carriageway, cycleway and footway as free of standing water as possible;
- to ensure surface water falling on the highway enters the drainage system or natural watercourse as quickly as possible;
- to keep the underlying road structure as dry as possible;
- to maintain the carriageway, cycleway or footway width;
- to remove leaf fall at locations where this is exceptionally heavy resulting in a serious road safety problem;
- to maintain the structural integrity of the verge or hedgebank.

3. Grass Cutting

The policy to achieve the County Council's objectives is given below:

A number of different categories of road are considered under this heading, each category being typical of a particular environment and benefiting from the appropriate maintenance attention.

(i) Roads within Urban Areas

Urban roads are generally defined as those within a 20, 30, or 40mph speed-restricted area with a number of surrounding residential or commercial properties or within built up areas of villages and hamlets. However, there are a number of roadside verges within 40mph speed limits, which continue to be considered of a rural nature and are therefore cut according to the guidelines in (ii) below.

Cutting on urban verges is undertaken a maximum of six times per annum for highway purposes to a residual height of 40mm, over the full width of verge. Cutting is undertaken more frequently on some urban verges for amenity purposes in association with the local City, Borough or District Council, with the County Council contributing for the six highway cuts. Cutting on visibility areas (junctions and the inside of bends) is undertaken on an 'as needs' basis and the current frequency of six cuts per annum has proved adequate.

The Area Highway Management Office is authorised to determine the timing of the cutting and whether the maximum number of six cuts is necessary. Any cuts additional to the maximum number will be regarded as being for amenity or environmental purposes and will be the responsibility of City, Borough or District Councils.

Within urban areas there may be a wildlife or amenity justification for reducing the frequency of cutting or for avoiding certain sensitive periods.

Partnership arrangements for commissioning the highway and amenity work are encouraged where appropriate.

The grass cutting policy on housing estate roads adopted by the County Council shall be as above. However, behind footways the verges will be regarded generally as the responsibility of the City, Borough or District Council.

(ii) Roads within Rural Areas

Cutting on visibility areas (junctions, lay-bys and the inside of bends) is undertaken on an as needs basis, a frequency of two or three times per annum on maintenance category 3 to 8 roads, and once on category 9 and 10 roads has proved adequate.

Verges on roads with a maintenance category of 3 to 8 inclusive are cut to a width of one metre from the road side channel twice per year with an intermediate cut only if shown to be absolutely necessary. Cutting on rural verges with a maintenance category of 9 or 10 is completed once per annum and a second cut will only be undertaken:

(a) in a prolific growing season, or

(b) at a location with particularly vigorous growth, or

(c) where only one cut would create a road safety hazard.

A full width cut (the autumn cut on maintenance category 3 to 8) is undertaken every third year to control the excessive growth of brushwood, scrub and harmful weeds.

Cutting is undertaken to a residual height of 100mm.

The timing of the cuts is to be at the discretion of the Area Highway Management Office or Agent Authority as appropriate but should take

account of local flowering and seed climax, unless there are exceptional circumstances to prevent this. In a normal growing season the rural cutting commences with major road visibility areas during mid May.

The rural verge grass cutting policy encourages a varied habitat across the verge with smaller wild flowers in the cut strip and the remaining uncut area permitting the growth of taller species that encourage wildflowers, insects, butterflies, birds and small mammals.

(iii) Circumstances when grass cutting standards can be modified where relevant to (i) &(ii) above

(a) Visibility areas, i.e. approaches to traffic signs and around street furniture where more frequent cutting may be necessary for road safety;

(b) Where it is necessary to cut verges and slopes to obviate a fire risk;

(c) Where infestations of harmful weeds occur, and additional cutting is required;

(d) Where it is necessary to gain access to hedgebanks and back ditches for cleaning and maintenance or to other structures or services required for the proper functioning of the highway;

(e) Where rare species, which require special protection, occur and where fine stands of wild flowers (such as orchids, bluebells, primroses etc.) exist, they should be left until they have seeded (see also Chapter 9 - Special Verges);

(f) In exceptional circumstances where it is necessary for people to walk or equestrians to ride a width of two metres will be cut;

(g) No early cut is to be carried out on moorland roads where cut bracken may harm animals;

(h) It may be desirable, in some locations, for a full width cut to be

undertaken on a more frequent basis, for example, to encourage wildflowers unable to compete with tall grasses and other coarse herbage. Such cutting may also be necessary to counter the growth and spread of aggressive or harmful weed species. Such additional cuts may be undertaken at the discretion of Area Highway Management Offices or Agent Authority, as appropriate.

(iv) General

Operatives are encouraged to use their initiative in avoiding the destruction of fine stands of wild flowers. The need for delay after flowering until seeds are set is impressed upon supervisors and operatives.

The use of grass growth retarder is not permitted.

Where Boundary Signs exist in the verge then the grass cutting regime should be carried out to the same standard as visibility splays around the base of the sign.

4. Weed Control/Clearance

The policy to achieve the County Council's objectives is given below:

(i) General

Physical and chemical (herbicide) weed control methods will be used on highways where they are practical, cost effective and environmentally appropriate. Innovative methods of weed control will be tested whenever possible to determine their suitability for highway use and with the aim of undertaking an integrated weed treatment regime. Where possible weed treatment work will be integrated into a co-ordinated programme with the City, Borough or District Council's highway sweeping, to remove living and treated weeds from carriageways, cycleways and footways.

(ii) The Use of Herbicides

All herbicides shall be approved by the Pesticide Safety Directorate or Health and Safety Executive and used strictly in accordance with the advice given by the manufacturer and the Department for Environment, Food & Rural Affairs, and the requirements of the current edition of The Control of Pesticides Regulations. All herbicides will be subjected to an additional approval process within the Environment Directorate before use.

Herbicides based on or containing any of the following will not be used under any circumstances:

- 2.4.5T
- Aldrin
- substances from the triazine group
- or any other nationally banned substance

Current herbicide use is as follows:

(a) The total, non-residual herbicide glyphosate will be used to control weeds on hard areas such as carriageways, cycleways, footways, kerblines and filter drains. The herbicide will be applied to the weed growth only. Application frequency will be once, twice or three times per annum to effect a reasonable control. At locations where the weeds are prevalent a total residual herbicide containing glyphosate and sulfosulfuron will be used. Under no circumstances will this herbicide be used near water or where it might enter a water course.

(b) Total herbicides used as part of footway construction or highway maintenance works shall be applied as a preventative measure:

- prior to application of thin surfacings, slurry seal, micro asphalt or surface dressing glyphosate and sulfosulfron;
- as part of footway construction or reconstruction work glyphosate and sulfosulfrom where weeds are present.

(c) The use of herbicides on vegetated areas is limited to the following:

- glyphosate around the base of young trees or saplings, and for the control of

Japanese Knotweed (or other invasive Knotweeds) and Giant Hogweed;

- Selective herbicides for the spot treatment of harmful weeds, as identified by the Weeds Act 1959 as follows: Common Ragwort, Broad Leaved Dock, Curled Dock, Creeping Thistle, Spear Thistle and Wild Oats. (see appendix B).

The use of approved herbicides on rural verges must be kept to the absolute minimum compatible with the required results to control harmful weeds in areas of highway responsibility.

Herbicides should be used during the period when they are most effective and the optimum results will be obtained. Herbicides should not be applied during or before weather conditions that would render their use ineffective or result in the contamination of surrounding areas.

In some locations, such as moorland areas where weed growth is unlikely to create a problem. The appropriate Authority should be consulted before weedkilling is undertaken.

New verges should normally be sprayed with selective herbicides across their full length and width within the first year.

Weed spraying near any watercourse requires Environment Agency notification prior to work starting. The Environment Agency can offer guidance on the control of weeds near watercourses.

5.Hedge and Tree Maintenance

The policy to achieve the County Council's objectives is given below:

(i) Existing Highway Hedges and Trees

Section 154 of the Highways Act 1980 places a statutory obligation on adjacent landowners/occupiers to ensure that their hedge, tree or shrub does not obstruct highway users, nor obscures visibility including illumination from street lights. Section 148 of the Act also requires the proper removal of parings from cutting works.

The County Council will only cut hedges in the following circumstances:

- on the inside of bends and at junctions and lay-bys on roads within maintenance category 3 to 8 inclusive to maintain visibility;
- on hedges owned by the Council;
- on approaches to and around traffic signals, signs and appropriate street furniture;
- to enable work to be undertaken at the edge of the carriageway, cycleway or footway;
- to provide access to drainage easements, ditches, buddleholes, grips and channels.

The cutting frequency shall be once per year except in exceptional circumstances and this will commence in mid May for safety and operational reasons.

Most landowners and farmers are aware of the importance of roadside hedges and trees and it is appreciated that maintenance has to be included with other farming activities. However, where a hedge or tree is causing an obstruction or restricting visibility the Council will contact the landowner/occupier concerned and request cutting. If this is not forthcoming a formal notice will be issued and then, if necessary, the work undertaken by the Council and the landowner/occupier recharged for the cost incurred.

The assistance of the National Farmers Union, DEFRA and the Country Landowners Association has been enlisted to persuade farmers and private landowners and occupiers to meet their statutory obligations in respect of trimming roadside hedges in their ownership, as well as the proper removal of parings from the hedge itself and from within the limits of the public highway.

Where road safety is not jeopardised, landowners, occupiers and farmers are recommended to undertake trimming preferably in January and February, to ensure that berries and nuts are available for feeding birds and other wildlife for as long as possible during the winter. Trimming should not take place during the main bird breeding season, March to July inclusive, unless unavoidable, for safety reasons. It should be noted that bird nesting may well take place beyond this period, with this particularly being the case for the rare Cirl Bunting found in South Devon (mainly in Teignbridge, Torbay and South Hams) that breeds into August and early September. Climate change has also advanced the onset of breeding for some species,

such as Robins and Blackbirds, that can now nest in February. Hedges that are cut every year support far less wildlife than those which are cut less frequently and where hedges set back from the edge of the road and safety considerations allow, farmers and landowners are encouraged to cut on a two or three year (or longer) cycle. If the side of the hedge adjacent to the road has to be cut every year for visibility, drainage or other reasons, consideration should be given to only cutting the top of the hedge once every two or three years or less frequently.

All trees within falling distance of the highway are collectively termed highway trees. For the purpose of inspection and maintenance by the County Council, any tree between the highway boundaries is considered to be a highway tree maintainable at public expense. Highway trees beyond these limits are considered to be maintained by private land owners or the land occupier.

A superficial inspection of highway trees is undertaken during highway safety inspections but this can only identify obvious defects. Additionally, an arboriculture 'expert' inspection of highway trees on maintenance category 3 to 5 roads (with over a certain trunk diameter) is undertaken on a 3 year rolling programme. High risk sites, for example highway trees that could affect schools, are gradually being introduced into this 'expert' inspection programme. For roads, maintenance category 11 & 12, no inspection is made but action will be taken upon receipt of any report concerning an unsafe tree.

It is expected that private highway tree owners would wish to arrange for their own inspections, but these will also be undertaken by the

Council on the routes that are included in the Council's 'expert' inspection programme. The council's inspection is not intended to relieve landowners / occupiers of their obligations in this respect.

Reports of potentially dangerous trees can be received from the public and other sources. Where these are received an expert or other site inspection will be commissioned and the appropriate action taken.

A potentially dangerous tree will be categorised from the inspection as either:

- Imminent Danger' requiring remedial action within 24 hrs and spray paint marked with either – " XX " to fell or " OO " for other remedial action.
- Urgent Attention' requiring remedial action within 6 months and spray paint marked with either – " X " to fell or " O " for other remedial action.

For an 'Imminent Danger' or 'Urgent Attention' tree between the highway boundaries, the remedial action will be commissioned by the County Council.

In the case of an 'Imminent Danger' highway tree on private land outside of the highway limits a letter will be fixed to the tree at the time of inspection notifying the owner / occupier of the Council's intention to undertake the remedial action to maintain a safe environment for road users. If the owner / occupier can be consulted at the time of the inspection they will be handed the letter and given the opportunity of undertaking the work if they so wish (in this case the County Council will inspect the site within 5 working days to check that the work has been completed). If the owner or occupier is not present and the tree is in the grounds of a property, the letter will be left at that property. However if the owner / occupier is not consulted at the time of the inspection the County Council will undertake the remedial work.

For an 'Urgent Attention' highway tree on private land outside of the highway limits a letter asking for the owner / occupier's remedial proposals will be fixed to the tree at the time of inspection, with details

of any work that is considered necessary. This will also be sent to the owner / occupier (where this can be determined). If no proposal for inspection, or remedial works, or 'no action' is received from the owner / occupier within five months of the date of the Council's inspection, the County Council will issue a Notice under section 154 of the Highways Act 1980 requiring the landowner / occupier to complete the work detailed in the Councils inspection. If this is not completed within 14 days the Council will undertake the work and attempt to recover the cost under the default procedure in the Highways Act.

Practical guidance on the identification of trees representing a potential hazard can be found in the Forestry Commission Practice Guide 'Hazards from Trees, A General Guide'. (HNMG November 2009)

(ii) Tree Planting

Tree planting is to be encouraged within the limits of the public highway and in appropriate circumstances on land immediately adjacent to the highway with the co-operation and agreement of the landowner.

Whilst the difficulties in Devon of finding suitable roadside planting sites are acknowledged because of narrow verges and roads bordered by hedgebanks it is worthwhile considering measures that can be taken to stimulate more planting.

The incidence of Dutch Elm Disease some years ago accelerated the demise of hedgerow trees and many of the individual trees growing in Devon's hedgerows continue to

disappear and are not being replaced. To a limited degree the planting of alternative species along roadsides will help to offset the loss to the Devon landscape. Landowners and farmers are encouraged to identify strong saplings in hedgerows, protect them and encourage them to develop into mature trees and supplies of suitable standard tags are available from the County Council for this purpose.

The principal purposes for which trees are planted alongside roads are:

- Landscaping - to integrate as far as possible the highway into the immediate landscape and to enhance the general landscape viewed from a distance;
- Screening - to screen eyesores and facilities associated with the road and ameliorate noise generated from the highway;
- Ecology - to provide habitats for native flora and fauna;
- Alignment - to emphasise the alignment of the road.

Each of the above reasons for planting may require different types of trees, but wherever possible, native trees and shrubs will be used.

The species recommended as being most suitable for roadside planting are listed in Appendix A.

Parish and District Councils and individuals may apply to the County Council for a licence to plant trees within the limits of the highway in accordance with Section 96 of the Highways Act 1980. Applications should be made to the appropriate Area Highway Management Office. Where tree planting is proposed within the boundary of a National Park, the appropriate National Park Officer should be consulted. Appendix E gives appropriate contact details.

(iii) Tree Planting Sites

Suitable planting sites within the limits of the highway are not always easy to locate and must satisfy certain criteria as determined by legislation and Government advice given in Appendix A, the most important being as follows:

- Do not interfere with visibility sight lines nor be detrimental to road safety considerations.

- Allow room for the proposed species to grow to their full spread without encroaching over buildings, footways, cycleways or carriageways.

Note: small trees and shrubs (see Appendix A) need room to grow to their full spread to prevent encroachment over visibility sight lines, footways, cycleways or carriageways. Taller trees tolerant of formative pruning may spread above and over visibility, pedestrian and vehicular zones without encroachment being a problem.

- Absence of overhead and underground services lines, cables and pipes;
- Suitable climate of site for proposed species;
- No possibility of future root damage to carriageway, footway or cycleway construction or foundations;
- Do not interfere with street furniture (e.g. signs, street lighting).

Additionally the following guidelines must be adhered to. However, in certain circumstances where environmental considerations are of special importance, a relaxation may be appropriate following consultation with the Network Management Road Safety Group:

(a) no tree or shrub likely to exceed a trunk diameter of 100mm when mature should be planted within the highway boundary on the outside of bends, or on the central island of roundabouts of less then 10 metre diameter;

(b) no tree or shrub likely to exceed a trunk diameter of 100mm when mature should be planted within 4.5 metres of the carriageway on arterial roads, principal roads and distributor roads, or on residential, collector and access roads (maintenance

category 3,4,5 and high speed category 6) where 85th percentile speeds in excess of 40mph are attained;

(c) no tree or shrub likely to exceed a trunk diameter of 100mm when mature should be planted within 2 metres of the carriageway on residential, collector and access roads (maintenance category 6, 7 and 8) where 85th percentile speeds are less than 40mph;

The restrictions in (a) above may be relaxed in traffic calmed areas if vehicle speeds are unlikely to exceed 20mph. The restrictions in (a), (b) and (c) may be relaxed at any location where planting would be protected by appropriate safety fencing;

(d) no tree or shrub likely to exceed 600mm in height when mature, should be planted within 2 metres of the edge of the carriageway, though it may be possible to relax this requirement in some circumstances subject to expert advice;

Shrubs not attaining the mature height of 600mm may well be encouraged as ground cover within 2 metres of the carriageway;

(e) no new planting of trees or shrubs likely to exceed 600mm in height should be undertaken within a visibility area or in such a position that when mature would interfere with visibility. This requirement may be relaxed following consultation with the Network Management Road Safety Group where 85th percentile traffic speeds are less than 20mph and the planting would not form a solid visual barrier;

(f) no tree or shrub should be planted on the approach or near to any railway level crossing without first seeking agreement with the rail authority. Consultation should take place with Network Rail or the appropriate private railway company;

(g) no tree or shrub should be planted which would, when mature, interfere with street lighting or obscure traffic signs or signals;

(h) certain types of trees should be avoided because of potential dangers to road users from excessive leaf fall, honey dew, falling branches, fruits and nuts etc;

(i) Planting sites immediately over or adjacent to underground pipes and cables or in the immediate vicinity of overhead cables should be avoided. Consultations with the Statutory Undertakers will be necessary;

(j) Sites should be chosen to avoid the possibility of future root damage to road foundations;

(k) For all new highway schemes, landscaping should be evaluated from the outset at the initial design stage and additional land take considered to enable planting within the above guidelines.

(iv) Tree Planting in New Development Areas

Narrow verges should not be created adjacent to the carriageway, being costly to maintain, and trees situated in such verges make maintenance more difficult, are unlikely to comply with planting criteria and aesthetically are not necessarily the best option. It is suggested that:-

(a) Planting is undertaken in verges or feature areas situated at the back of the footway possibly by agreement on land, which it is not the responsibility of the highways authority to maintain. In the case of new layouts which are being considered, it may be appropriate for tree planting to be made a condition of planning consent within the boundary of the new development.

(b) The use of forest trees singly or in groups in suitable feature areas can be more effective and involve less maintenance than smaller trees planted at regular intervals.

(v) Landscaping and Potential of Land Adjacent to Highways and Ancillary Land Surplus to Requirements

Where the Authority owns areas of land adjacent to the road or between carriageways several possibilities arise for the use of land, for example:

(a) the planting of coppice (hazel, chestnut, ash, willow) to be cut back every seven to ten years;

(b) the planting of a forest plot of poplar, willow, alder, birch;

(c) the planting of native trees and shrubs to create new woodlands as a natural habitat for wildlife;

(d) the planting of specimen trees individually or at intervals; e.g. as a formal avenue;

(e) the planting of irregular groups of trees;

(f) the planting of suitable native species within existing hedgerows or along existing highway boundaries.

(vi) New Planting in Existing Urban Areas

In practice in the established urban areas there are few suitable sites within the limits of the highway for new planting, but opportunities do exist for planting within the foregoing criteria with careful selection of species:

(a) in wide verges, central reservations and roundabouts;

(b) in pedestrian precinct areas (possibly using large containers);

(c) at road improvement sites;

(d) in wide footways in shopping streets.

There is scope for planting shrubs and small ornamental trees in small feature areas, reservations and verges with a potential for reducing long term maintenance.

(vii) Replacement of Existing Trees

Where existing highway trees are removed because they are diseased or dying but where there are no known safety or other problems then as a general rule they should be replaced even though the foregoing criteria may not be strictly adhered to. Where there are safety problems or the possibility of damage to adjoining properties it is sometimes possible to replant a more suitable variety or find an alternative site.

(a) Isolated specimen trees should be replaced unless they present a particular hazard such as blocking a narrow footway or are actually in the carriageway;

(b) Existing trees may be situated within existing or newly constructed visibility areas whilst new planting in such areas will not be permitted. It may be possible to retain single specimen trees under certain circumstances provided they do not restrict visibility to an unacceptable extent. If the tree or trees concerned should eventually have to be removed for any other reasons such as disease then they should not be replaced within that area.

Avenues of trees in urban areas do not generally comply with the foregoing highway constraints. Nevertheless, provided such trees do not present any particular safety or environmental problems, then those that have to be removed for any reason should be replaced. Where avenues are of unsuitable varieties, replacements should not necessarily be of the same variety and in such cases there should be a long term programme of replacement with a more suitable type or types of tree.

Where, because of potential damage or danger, whole avenues of trees have to be removed, it may be possible to phase replacement with more suitable types to enable some new trees to become established before removing the remainder of the avenue. Where site conditions permit, consideration should be given to replacing avenues at the back of the footway or opportunities might exist for alternative feature planting outside of the highway limits.

(viii) Choice of Trees for New or Replacement Planting

The number of species of trees that are suitable for highway planting is extensive and a correct choice of tree must be carefully made having regard to the circumstances of the site in question. When new planting

is contemplated expert advice should be sought to establish the most suitable species and siting in relation to the highway and having regard to the soil types and microclimate of the site. A predominance of one variety should where possible be avoided to minimise the effect of any future widespread disease.

Whenever possible native trees and shrubs should be used but in some urban situations better results might be achieved by the use of exotic or naturalised trees and shrubs.

Appendix A gives a guide to species which are normally acceptable for roadside planting. Each site should be considered individually and advice sought.

Appendix E gives the address and telephone number of departments and organisations from which expert advice can be obtained.

(ix) Standards and Methods of Planting

(a) Trees should meet the requirements of BS 3936 Part 1 and Part 4 for Forest Trees;

(b) Planting should be carried out to BS 4428. The cultivation and planting of semi-mature trees should be to BS 4043.

The following information is given for guidance as a general method, but may need to be varied to suit some species and conditions.

(a) On delivery, trees should be planted immediately or heeled in. Under no circumstances should trees or shrubs be left with their roots exposed prior to planting. If roots have dried in transit then trees should be rejected. Evergreens, including conifers should always be immersed in water before planting. Watering and mulching may be necessary immediately after planting and in the event of a dry spell;

Further information and advice is available from the Environment Directorate, Devon County Council, or the appropriate National Park Officer when planting within the boundary of a National Park;

(b) Excavate a hole large enough to accommodate the complete spread of roots;

(c) Loosen soil to a depth of 150mm-200mm with a fork, add fertiliser if the soil is poor or in some cases it may be necessary to import good quality top soil. Lightly firm base by treading. The final planting soil level of the tree must be the same as the soil level in the nursery;

(d) Drainage under the tree may be required in very wet conditions;

(e) Remove all large stones from the excavated material or replace with good quality top soil;

(f) If the tree is to be staked, the total stake length should be two thirds of the tree height, half of the stake length being below ground level. The tree should be planted on the leeward side of the stake. The soil should be added slowly ensuring that it runs well between roots and left lightly compacted above original ground level to compact with weathering;

(g) The tree should be secured to the stake with one tree tie at the top of the stake;

(h) In some urban areas, where vandalism and physical damage to trees may be a problem, consideration should be given to using a long stake and an additional tree tie to provide an upper support point high in the crown of the tree;

(i) The stake should be removed at the start of the second growing season to provide an opportunity for the tree to regain a natural balanced stem formation;

(j) The use of a tree shelter in the establishment of broad-leaved trees may be appropriate. A tree shelter is a plastic sleeve, which surrounds a newly planted sapling offering it a much greater degree of protection, and also creates conditions similar to a miniature green house. Tree shelters encourage growth particularly in exposed areas where establishment is difficult because of strong winds, which may be salt laden in coastal areas. They protect young trees from damage by deer and rabbits depending on their height. They also identify young trees for routine maintenance and protect them from strimmer damage and chemical spray drift.

However tree shelters limit lateral spread within the height of the shelter deforming the shape of shrubs. This can increase the planting costs by up to one hundred percent and increase maintenance costs through the need to weed inside the tube and remove and dispose of the tube and stake if they do not degrade as quickly as predicted.

(x) The Maintenance of Newly Planted and Established Trees

Regular inspection and maintenance of newly planted trees are of prime importance both in the urban and rural situation. The removal of competing vegetation is important to prevent the death of the tree. After 5 or 6 years they are normally well established but inspection and attention is always advisable.

The following routine maintenance is necessary to ensure healthy growth and prevent the development of safety and environmental problems.

(a) Newly planted trees should receive regular attention, firming of soil, checking of tree ties and stakes and removing stakes where appropriate. Protective fencing or guards may be necessary and these need to be maintained in an effective and safe condition. In the initial stages, remove competing vegetation from within 0.5 metres of each tree, mulch the cleared area if possible and water when necessary and if practical;

(b) There should be formative pruning in the early stages to remove weak shoots, crossing branches, diseased and decayed branches and poor forks;

(c) There should be a programme for the regular pruning of all urban trees particularly those situated close to the carriageway or to buildings and structures;

(d) Heavy crown reducing (pollarding) should be avoided by routine pruning;

(e) Action should be taken to remove suckers, to treat bark damage and to deal with root compaction;

(f) Dead or dying or seriously vandalised newly planted trees should be replaced.

It should be borne in mind that additional cost could be incurred in mowing highway verges where the full passage of machinery is inhibited by planting and in such circumstances damage can be caused both to trees and to mowing machinery. It is recommended that the boundaries of new plantings in roadside verges be defined by white painted pegs.

Organisations such as the International Tree Foundation are often willing to become involved with the routine maintenance of both newly planted and established highway trees in liaison with Area Highway Management Offices and such arrangements should continue and be encouraged.

Volunteer Parish Tree Wardens are being appointed by Parish Councils to gather information, give advice and encourage practical tree related projects within the parish. Liaison should be established between the Tree Warden and Area Highway Management Office via the Community Council of Devon.

(xi) New Roadside Hedges

In rural areas landowners are to be encouraged to accept a planted hedge as an accommodation work on road improvement schemes or new roads, possibly in addition to fencing. Where possible the planting should include new trees that will grow into mature specimens. The hedge/trees will then become the property of the landowner who will be responsible for their future maintenance.

Where hedges have to be removed as part of a planning consent, or road improvement scheme, the repositioning or rebuilding of the hedge by mechanical or other means should be investigated.

Various methods of new or replacement hedgebank construction are acceptable and will be considered by the County Council following consultation with the County Ecologist.

6.Highway Safety Reaction & Clearance of Debris

The policy to achieve the County Council's objectives is given below:

(i) General

The County Council will attend the scene of a road traffic accident at the request of the emergency services, to clear debris from the carriageway, cycleway or footway. This does not include blood or bodily fluids, which should be removed by the District, Borough or City Council under their street cleansing and environmental health responsibilities.

Non-hazardous spillages (liquid or solid) will also be cleared and the carriageway, cycleway or footway temporarily treated if appropriate.

The location of dead animals or abandoned vehicles notified to the County Council will be forwarded to the relevant District, Borough or City Council for the appropriate action to be taken.

Locations where particularly heavy autumn leaf fall creates a serious road safety problem will be discussed with the local District, Borough or City Council and the County Council will arrange for their removal where appropriate.

Section 148 of the Highways Act and Devon County Council Bylaw 22 makes it an offence to deposit any dung, compost, rubbish or other material (e.g. mud or hedge cuttings) on a made-up carriageway or on the highway if it interrupts any user. If the deposit constitutes an

immediate danger on a major route the County Council will remove it and may attempt to reclaim the cost of doing so from the offender in accordance with Section 149 of the Act. If the deposit does not constitute an immediate danger or is on a minor route, the offender will be requested to remove it and a formal notice issued if he fails to act upon the request. If he then fails to act on the notice the default procedure in the Act may be followed.

Section 150 of the Highways Act places a duty on the County Council to remove obstructions from landslips, the falling down of banks and soil washed onto the highway. Where appropriate the County Council may pursue retribution from the landowner/occupier through the court for any remedial work undertaken.

Where persistent or serious local landslips or washout problems occur then the following action will be taken:

a) the landowner will be approached and requested to implement solutions (such as a change in ploughing practice and if necessary seek specialist farming advice) to alleviate the problem.

b) if after this initial approach no action is taken, a notice will be served by the County Council under Section 151 of the Highways Act 1980 requiring the landowner to carry out works within 28 days to prevent the problem recurring. The landowner will also be advised that the Council is likely to hold him liable for the cost of clearing any soil which accumulates on the highway during the intervening period.

7.The Clearing of Ditches, Buddleholes & Easements & Verge Structural Maintenance

The policy to achieve the County Council's objectives is given below:

(i) Routine Maintenance

Buddleholes, grips and easements will be cleaned annually and ditch cleaning will be undertaken on 'as needs' basis to ensure the continued functioning of the system.

Siding and ploughing works will be carried out at the carriageway, footway or cycleway edge on unkerbed lengths prior to surface treatment works, and on a more regular basis at known trouble spots where drainage problems exist. It is important that hedges and hedgebanks are not undermined during this operation and where possible, suitable material (waysoil) from siding works will be recycled back to the adjacent verge or hedgebank using the Devon Banksman machine or by hand. Waysoil generated from siding operations by any other mechanical method of working will only be returned to verges when the following criteria are met. (also see 7ii):

- the verge needs to be repaired for structural reasons (e.g. overriding by vehicles) or to facilitate grass cutting;
- the verge is within five kilometres of the source of the waysoil and the general character of the underlying soils is similar;

- the work is undertaken in accordance with the requirements of the Environment Agency.

Problems can be caused for adjoining landowners by the deposition of soil on top of hedges unless by hand or by the Devon Banksman, and if this is likely to be a problem such action should only be taken with the express permission of the landowner concerned.

Waysoil will not routinely be stored at depots or roadside landings unless the necessary accommodation works have been completed and the appropriate licence or exemption certificate has been obtained through the Environment Agency. Signs must be erected at each location stating "Devon County Council" - Materials for Re-use" and the waysoil should be properly segregated from other materials and the appropriate drainage measures taken to avoid contamination from any run off.

Should the waysoil be surplus or not be suitable (should it contain stone chippings, harmful weeds, litter or other debris) it should be removed from site and taken to a disposal site with the appropriate site licence or a site with the necessary Environment Agency exemption certificate.

(ii) Verge Structural Maintenance

It may be necessary for structural reasons or to facilitate cutting, to raise the level of verges by the deposition of waysoil. Suitable waysoil may be used for this purpose but only on verges within five kilometres of its source and where the general character of the underlying soils is similar. In all such cases consideration must be given to drainage and ecological implications (in consultation with the County Council's Ecologist) in the preceding spring/summer before this operation is undertaken.

Imported waysoil from sources outside of the five kilometre limit should only be used in exceptional circumstances and following consultation with the County Council's Ecologist and the Environment Agency.

All operations shall be undertaken in accordance with the requirements of the Environmental Protection Act 1990 and haulage must be undertaken by registered carriers.

Where verges are overlain the waysoil shall be spread evenly to the specified thickness, broken down to a fine tilth and properly levelled.

On verges where waysoil is deposited before overlaying, notice shall be erected stating "Devon County Council Verge Repairs" and the levelling of the waysoil shall be completed before the end of that working week.

In moorland areas where the level of a verge is to be raised, or other maintenance or statutory undertakers work is planned, consideration should be given to the prior removal, storage and subsequent replacement of the existing turf in addition to seeding with the grass seed mix as detailed in Appendix C.

8. Statutory Undertakers Working on Verges

It is common practice for the Statutory Undertakers to place their apparatus in the verge.

Under the New Roads and Street Works Act 1991 (NRSWA) Statutory Undertakers are required to follow the principles of the Act in carrying out their works.

The Act requires that all works carried out in connection with the provision of services and or the placing of apparatus under the surface of the "highway" must comply with the relevant codes of practice produced in conjunction with the NRSWA. The following notes are based on information contained in the Act and the Code of Practice for the Reinstatement of Openings in Highways.

Section S9 of the Code (verges) requires that:-

- All backfill materials comply with requirements of Section S5 of the Code of Practice;
- Grassed areas shall be reinstated using the original turf replacement turf or an equivalent seed, depending on weather and growing season. In all cases, a reasonable growth shall be established within the following 12 months. Within previously mown areas, the surface shall be left free from stones greater than 20mm nominal size;
- Any shrubs, trees or planted areas shall be reinstated with the same species, unless otherwise agreed, and shall be established within the following twelve months;
- Existing topsoil within 200mm of the surface shall be kept separate for subsequent re-use. Alternatively, an imported topsoil may be used to a depth of 100mm or to match the existing depth of top soil, whichever is less. (Note: Undertakers must consult with the street authority and Environment Agency before importing topsoil);

- Where road construction layers have been incorporated within the verge, providing edge support to the road structure, the reinstatement shall comply with the requirements of Section S8.6 of the Code of Practice;
- Verges, ditches and drainage courses shall be restored to their original profile, unless otherwise agreed.

The following sections of the Code of Practice will also have an impact on works carried out by the Statutory Undertakers:

- **Section S3.4.1 -** Excavated materials

All excavated materials that are to be re-used should be protected from excessive drying or wetting during storage. Additionally, these materials should be excavated, stored, handled and laid so as to avoid contamination and loss of fines.

- **Section S3.6 -** Drainage

Any drainage disturbed during excavation shall be immediately notified to the owners, and restored to the requirements of the owner; see Section S11.4.

- **Section S2.3.1 -** As-laid profile

All fixed features, e.g. kerbstones and related pre-cast concrete products, channel blocks and drainage fixtures, surface boxes and ironware, shall be laid to coincide with the mean level of the immediately adjacent surfaces. The maximum allowable tolerance between the levels of the feature and the immediately adjacent surfaces shall not exceed plus or minus 6mm.

The Statutory Undertakers should route new mains clear of the root system of existing trees. The information should be brought to the Statutory Undertaker's attention when notification of proposed work is received under the New Roads and Street Works Act 1991.

Normally, where apparatus is installed underground in a maintainable highway, the Statutory Undertakers should consult the street authority about the appropriate depth of cover of the apparatus and its lateral

position in the highway or street. Advice to Statutory Undertakers when excavating near trees is given in Appendix A.

The above is only a brief outline of the requirements of the NRSWA. Further details can be obtained from the Act and the associated relevant Codes of Practice. The County Council's Street Works Section can also be contacted for advice (see Appendix E).

9. Special Verges

There are many special verges identified within Devon where flora and fauna of local or national interest exist. The policy identifies the need to limit grass cutting during specified protection periods and protect these verges from other damaging activities. Where practical, further management measures will be undertaken to conserve and enhance the verge.

A comprehensive survey of special verges has recently been undertaken and this will provide essential information to enable these sites to be managed more effectively. This is an objective of Devon's Biodiversity Action Plan. Appropriate verges that are within Sites of Special Scientific Interest (SSSI) are also being identified in partnership with English Nature.

Where Parish Councils or other interested bodies identify any lengths of verge in their area whose visual quality warrants protection, the Parish Council or local association will be asked whether they are willing and able to undertake the work involved in its management before the verge is treated as a special verge. This will help to ensure that the County Council can properly inspect and manage all special verges to the standards required by their status.

To assist grass cutting and other operations when working in the vicinity of special verges, the location of each verge should be denoted by the erection of a small timber post and metal identification plate at each end of the site, as shown at Appendix D. However, in areas where the post and plate is regularly stolen, a timber post with a red top is now installed.

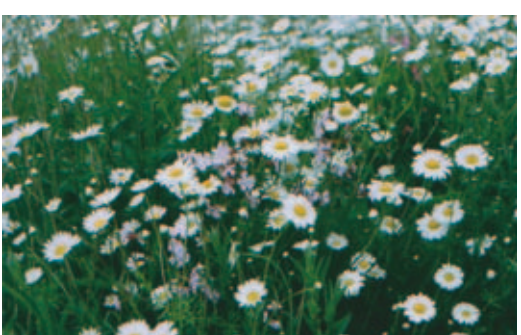
Within the boundary of any National Park, the location of special verges should be denoted by the installation of two metal studs at the edge of the carriageway unless permission is obtained from the National Park Officer to use the post and plate.

10. Wildflower and Grass Seed Mixes

In certain areas naturally occurring local species of wild flowers are scarce and consideration is given to enhancing such roadside verges with an appropriate wildflower mix, either separately or incorporated in a grass seed mix. Only seed of a native provenance will be used. The mix should be specially selected to suit local conditions and the intended scheme objectives following consultation with the County Ecologist. When used in conjunction with grass seed, a low growing, low maintenance mix should be chosen, such as that detailed in Appendix C.

The use of wildflower seed is most effective when establishing new verges. Where the aim is to enhance the floristic diversity of existing verges, better results are likely to be obtained through the planting of wildflower plugs.

The general aim is thus to provide the most appropriate species ecologically and aesthetically, but in addition, offer the option of increasing the range of indigenous species.



11. Adopt a Verge and Public Involvement

Some schools in Devon have "adopted" a length of roadside verge as a long-term project to monitor the growth of flora and the effects of wild flower seed mixes. This helps to foster an appreciation of the need to conserve Devon's heritage.

In addition to the interest being promoted in schools, local associations such as amenity societies and Womens' Institutes are encouraged to continue their involvement in liaison with their respective Parish Councils.

It is important to note that Section 13 of the Wildlife and Countryside Act 1981 refers specifically to the protection of all wild plants and makes it an offence to uproot them without the authority of the landowner or occupier. The Act also gives details of fully protected wild plants that it is an offence to intentionally pick, uproot or destroy.

12. New Verges

Where new verges are created by major road improvements or new road schemes, consideration should be given to the most appropriate action to establish the verge sward.

In low fertility situations and where conservation interests are a priority, natural colonisation of the verge is an option. This is particularly appropriate on rocky embankments or where topsoil or sub-soil low in nutrients is used to make up the verge.

Where there is a need to establish a sward quickly for visual or stability reasons, or where high nutrient levels are likely to result in weed problems, new verges will be seeded. A low growing, low maintenance grass mix will be used, such as detailed in Appendix C. This should enable the gradual colonisation of wild flowers over time. Where practical, this standard mix should be of native provenance and might be varied through the incorporation of a wider range of suitable native grasses such as crested dog's-tail, sweet vernal-grass, meadow foxtail or meadow barley.

In certain cases, it might be desirable to supplement this with an appropriate wild flower mix. This should be specially selected to suit local conditions following consultation with the County Ecologist.

In grazed moorland situations, the normal presumption will be to use a low maintenance mix (or equivalent) such as that detailed in Appendix C.

Wherever practical, newly topsoiled verges will be prepared for seeding by creating a fine tilth and then allowed to vegetate naturally for a time. At this point, the decision can be taken on the need for seeding. If seeding is required, the establishing vegetation will be eliminated to achieve a weed-free seed-bed through the application of a broad-spectrum herbicide such as glyphosate. Following further preparation as necessary to create a fine tilth, the ground can be seeded with the selected mix.

New verges will be maintained regularly until they are established and free of harmful weeds. This will usually involve four cuts in the first year (i.e. in March, May, August and October) and might require the use of selective herbicides to control weed problems.

13. Verges in Shared Surface Residential Roads

Generally, in a shared surface road no footway is provided and both pedestrians and vehicles share the carriageway. In place of a footway there is a roadside verge which is laid to grass and will accommodate services such as gas and water mains, electricity and telephone cables. The extent of the verge can be identified by the flush kerb laid in driveways or a small boundary stone in the verge. The verge should be kept clear of all obstructions by the residents so that the services underneath can be maintained. Residents should not dig up or plant anything in this verge or construct rockeries, walls or fences on it. Statutory Undertakers have a right to use the verge and any obstructions may be removed by the County Council.

14. Historical And Archaeological Features

It is County Council policy to protect historical and archaeological features on roadside verges and these features are identified and recorded on the highway information management system.

15. Harvesting of Grass Verges by Farmers

The County Council would consider a request by the National Farmers' Union for the harvesting by farmers of grass verges, subject to conditions to be stipulated by the Environment, Economy and Culture Directorate and to full indemnity being given to the County Council.

16. Milk Vat Stands

The construction of hardstandings in the highway verge measuring 2 metres square, for use as milk vat stands is permitted subject to specific conditions stipulated by the Environment, Economy and Culture Directorate.

17. Grazing Of Animals

Provided a farmer obtains prior consent from the County Council, the grazing of animals, e.g. goats, may be permitted on highway verges at locations where visibility will not be obstructed. Any animals left to graze on highway verges must be tethered and not allowed sufficient scope to encroach onto the carriageway, cycleway or footway.

18. Storage of Timber and Other Materials on Roadside Verges

The storage of building or construction materials, felled timber and the like on roadside verges is discouraged. However, in exceptional circumstances it may be possible to permit such storage subject to conditions stipulated by the Environment, Economy and Culture Directorate and full indemnity being given to the County Council.

19. Litter on Roadside Verges

The Environmental Protection Act places the responsibility for highway litter clearance with the District, Borough or City Council as part of their street cleansing function. However, Devon County Council requires its contractor to remove litter from areas of verge and visibility splays during grass cutting operations. This will help to enhance the appearance of Devon's highway verges.

20. Salt Storage on Roadside Verges

During the winter it is sometimes necessary to locate grit bins or bags of salt/grit on roadside verges on steep hills or 'trouble spots' that are not on the Council's precautionary salting routes. The salt/grit is available on a 'self help' basis for local road users.

The use of roadside open heaps is now discontinued because of the risk of pollution.

The colour and type of any bin must be carefully selected and the siting of any bin must be controlled to avoid the pollution of streams or other watercourses. Siting should be at least 15 metres from the root areas of trees (particularly beech) and at least 4.5 metres from any hedge. Siting on Special Verges should be avoided.

(i) Grit Bins

Grit bins will not be sited on the salting network (unless at railway level crossings where grit bins will only contain grit). They will be sited at known trouble spots usually in urban areas but also in some rural locations where particularly difficult conditions exist.

Dependent upon location the material used may be salt, grit or a combination of both.

Grit bins will only be used within National Parks when the appropriate Park Authority has given permission.

(ii) Bagged Salt/Grit

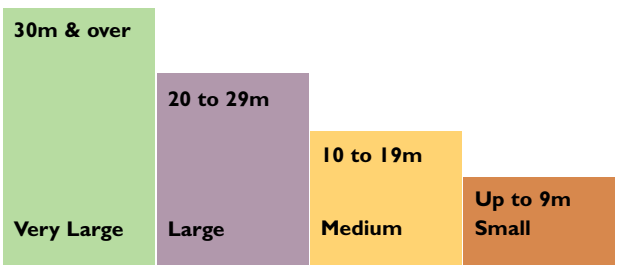
Use of bagged salt/grit should be kept to a minimum and all bags will be removed at the end of the winter period. They will be sited at known trouble spots where grit bins are not suitable due to limited space or within sensitive areas, provided that animals have limited or no access (with the exception of moorland areas).

Salt, grit or a combination of both may be used.

Heavy duty material or double bagging must be used to prevent leakage.

Appendix A - Trees for Roadside Planting

(i) Trees and Shrubs Normally Suitable for Roadside Verges - Relative Mature Heights



Species	*Maximum Height*	*Average Height*	*Preferred Soil Type*	*Shade Tolerance*	*Exposure Tolerance*	*Remarks*
Beech *(Fagus sylvatica)*	30m	28m	Dry-light	Good	Good	Forms dense shade, ideal for hedging. May shed branches
Ash *(Fraxinus excelsior)*	30m	24m	Any			
Sessile Oak *(Quercus petraea)*	30m	23m	Well drained acid		Good	
Small Leaved Lime *(Tilia cordata)*	30m	20m	Heavy-alkaline			May form honeydew

Species	Maximum Height	Average Height	Preferred Soil Type	Shade Tolerance	Exposure Tolerance	Remarks
Pedunculate Oak *(Quercus robur)*	25m	23m	Heavy-alkaline	Poor	Good	
Silver Birch *(Betula pendula)*	25m	13m	Light-acid dry		Good	
Hornbeam *(Carpinus betulus)*	20m	16m	Heavy-alkaline	Moderate	Good	Suitable for hedging
Wild Service Tree *(Sorbus torminalis)*	20m	14m	Heavy-alkaline	Moderate		
Downy Birch *(Betula pubescens)*	20m	12m	Light-acid - wet	Good		
Alder *(Alnus glutinosa)*	18m	10m	Damp-Alkaline	Good	Good	
Cherry (Gean) *(Prunus avium)*	18m	16m	Heavy-acid	Poor		
Field Maple *(Acer campestre)*	15m	10m	Heavy-alkaline	Good	Good	Suitable for hedging
Aspen *(Populus tremula)*	15m	8m	Any		Good	Forms suckers easily
Rowan *(Sorbus aucuparia)*	15m	5m	Light-acid-dry	Moderate	Good	
Crab Apple *(Malus sylvestris)*	10m	9m	Alkaline	Poor		
Goat Willow *(Salix caprea)*	10m	5m		Poor	Good	
Holly *(Ilex aquifolium)*	10m	8m	Any	Moderate		Suitable for hedging

Species	Maximum Height	Average Height	Preferred Soil Type	Shade Tolerance	Exposure Tolerance	Remarks
Hawthorn *(Crataegus monogyna)*	8m	8m	Any	Moderate	Good	Suitable for hedging. Forms small tree if trimmed
Hazel *(Corylus avellana)*	6m	5m	Any	Moderate	Good	Suitable for hedging
Elder *(Sambucus nigra)*	5m	4m	Any			
Grey Willow *(Salix cinerea)*	4m	2.5m	Damp	Poor	Good	
Blackthorn *(Prunus spinosa)*	3m	4.5m	Any	Moderate	Good	Forms dense thickets, good for hedging
Dogwood *(Cornus sanguina)*	3m	2.5m	Damp-alkaline	Moderate	Poor	Suckers easily. Forms dense thickets if unrestricted
Guelder Rose *(Viburnmum opulus)*	3m	2m	Damp	Poor		
Wayfaring Tree *(Viburnum lantana)*	3m	2m	Well drained alkaline	Poor		
Butchers Broom *(Ruscus aculeatus)*	0.8m	0.8m	Well drained Alkaline	Good	Good	

NOTES: 1. The above list is a basic one from which species for roadside planting will normally be selected. If other species are to be considered their suitability for that specific site should be carefully checked.

(ii) Trees And Shrubs Not Normally Suitable For Roadside Verges

Non-native species and decorative cultivars of native species will not normally be considered suitable for roadside planting. However, in urban areas where more decorative trees and shrubs may be acceptable, non-native and introduced species will be considered. In each case the species used must be carefully chosen to suit the individual site under consideration.

Trees considered unsuitable for planting include Elm, Sycamore, Sweet Chestnut and Horse Chestnut.

(iii) Excavations Near Trees

The National Joint Utilities Group has issued the following guidelines for installing and maintaining utility services close to trees that must be followed when working near trees.

Damage to Trees

(a) Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil. They often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway and into front gardens, but they can also grow under the carriageway.

If roots are damaged, for example by trenching, the tree may fall or lose its vigour and decline.

(b) Tree trunks can be easily damaged, so be careful when working near them. For example, don't lean paving slabs against trees, don't chain machinery to them or nail site notices to their trunks.

Protecting Roots

(a) Establish a protection zone around each tree: the Precautionary Area. See Fig. 1.5

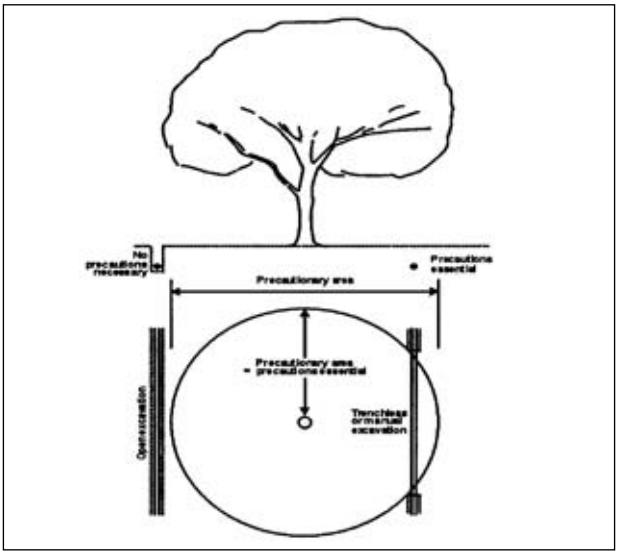


Fig 1.5 To determine the Precautionary Area measure the girth of the tree at chest height. Multiply this by 4 and draw a circle of this radius from the centre of the tree.

In the Precautionary Area:

- Don't excavate with machinery. Use trenchless techniques where possible. Otherwise dig only by hand.
- When hand digging, carefully work around roots, retaining as many as possible.
- Don't cut roots over 25mm in diameter, unless the Local Highway Authority's representative agrees beforehand.
- Prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

- Backfill the trench with an inert granular material and topsoil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.
- Don't repeatedly move/use heavy mechanical plant except on hard standing.
- Don't store spoil or building material, including chemicals and fuels.

Frost can damage roots. If trenches are to be left open overnight, cover the roots with dry sacking. Remember to remove the sacking before backfilling.

(iv) Summary Of Legislation Relating To Highway Trees & Hedges

This list is not exhaustive but is intended to aid easy reference and generally legal advice of the County Solicitor should be sought to assist in interpretation. Any cases of claims against the County Council should be referred to the County Solicitor under established procedures.

Highways Act 1980

Section 64 Confers powers on Highway Authorities to undertake work in dual carriageways, including planting for safety and amenity reasons.

Section 68 Authorises planting in street refuges.

Section 79 Gives powers to remove trees which obstruct views on corners or prohibit planting such trees.

Section 96 General powers of Highway Authorities to plant trees and shrubs and to lay out grass verges in highways. Also covers the liabilities of highway authorities for any obstruction or damage caused by their planting.

Section 136 Covers damage to carriageway caused by exclusion of sun and wind as a result of planting.

Section 141 Restrictions on planting in or near the carriageway (subject to the provision of sections 64, 96 and 142 of the Highways Act 1980).

Section 142 Enables a Highway Authority to issue a licence to the occupier or owner of premises adjoining the highway to plant trees, shrubs, plants or grass in areas of the highway agreed by the Highway Authority.

Section 154 Gives powers to appropriate authorities to deal with:-

(i) Obstructions caused by trees, hedges or shrubs overhanging a highway or other roads or footpaths to which the public have access;

(ii) That by reason of its condition, or part of it, any tree, hedge or shrub likely to cause danger by falling on the highway, road or footpath.

Town and Country Planning Act 1971

Sections 59-62 Deals with trees and Tree Preservation Orders. No tree the subject of such an order should be cut down, topped or lopped without the consent of the Planning Authority subject to exemption in the case of dead, dying or dangerous trees.

Section 213 Enables authorities to undertake amenity planting in highways. This includes District Councils but they must first consult the Highway Authority.

Forestry Act 1967

Gives powers to the Forestry Commission to licence the felling of trees.

Town and Country Amenities Act 1974

Section 8 Details of notice to be given by owners within Conservation Areas of their intention to lop, top or remove trees over stipulated sizes.

Wildlife and Countryside Act 1981

Provides protection for nesting birds and other conservation interests.

National Parks and Access to the Countryside Act 1949

Gives local Planning Authority power to plant trees on land within their area.

Hedgerow Regulations 1997

Introduces a procedure for the protection of 'Important Hedgerows' and requires prior notification to be given to local planning authorities of the intended removal of hedgerows.

Appendix B - Harmful Weeds

(i) Common Ragwort (Senecio jacobaea)

Description

Leaves are deeply cut and toothed with a ragged appearance, usually deep green on top, the underneath being whitish green. The leafstalks and lower part of the stem may have a purplish colour. Stout leafy flowering stem up to one metre high, branched at the top. Flower heads carried in a large flat-topped cluster open from Midsummer onwards, daisy-like, bright yellow, about 2cms across.

Danger of Poisoning

Ragwort is thought to cause more loss amongst farm livestock than all other poisonous plants.

Legislation

Ragwort (Senecio jacobaea) is one of the harmful weeds specified in the Weeds Act 1959. This Act gives the Department for Environment, Food and Rural Affairs (DEFRA) power to serve notice upon the occupier of any land, on which Ragwort is growing, requiring him to take action within a specified time to prevent the weed spreading. An occupier, who unreasonably fails to comply with such a notice, renders himself liable to prosecution and to a fine not exceeding £1,000.

Further Information and Control

For further information and details of control methods DEFRA publish an advisory leaflet "Identification of Injurious Weeds" together with a leaflet on the Weeds Act 1959. A contact address is given at the end of this Appendix.

Where large infestations of Ragwort exist on highway verges or embankments these will be treated with the herbicide 2,4-D where appropriate. However, where growth is sporadic, manual hand pulling will be used, the Ragwort bagged on site before transportation to a licenced disposal site.

Ragwort Conrol Act 2003.

Highway verges in close proximity (<150m) to equestrian centres, donkey sanctuaries and riding schools are risk assessed to determine their suitability for inclusion in the performance contract and therefore achieve a higher standard of control. (HNMG July 2004)

(ii) Broad Leaved Dock (Rumex obtusifolius)

Description

Leaves are up to 300mm in length and are of an elongated heart shape, the breadth being at least half the length. They are pointed and flat with the margin sometimes rather wavy. The flowering stem which may be up to 1.2m tall is well branched. It bears numerous leaves in the lower part but the upper part has fewer leaves. The flowering stems grow up from mid-May onwards and flowering starts in late June or July and may continue into the winter. The fruit, when fully ripe, often remains in clusters on the stems and is of a striking reddish-brown colour.

Legislation

DEFRA has power, under the Weeds Act 1959 to require an occupier of land to prevent the spread of broad leaved dock. Under the Plant Varieties and Seeds Act 1964 the Minister has power to prohibit the sale of seeds containing more than the prescribed proportion of dock and sorrels.

Further Information and Control

For further information and details of control methods DEFRA publish an advisory leaflet "Identification of Injurious Weeds" together with a leaflet on the Weeds Act 1959. A contact address is given at the end of this Appendix.

(iii) Curled dock (Rumer crispus)

Description

Image © Paul Hackney

The leaf of the curled dock is narrower than that of broad leaved dock, its length being at least three times its breadth with the sides appearing roughly parallel. The leaves and their edges are wavy. The flowering stem is erect and rarely branched. The branches are angled close to the main stem and have rather small leaves throughout their length. Growth starts in May and flowering in early June.

Hybrids between curled dock and broad leaved docks are quite common, exhibiting the full range of intermediate characteristics.

Legislation

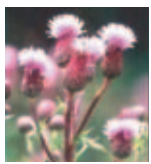
DEFRA has power, under the Weeds Act 1959, to require an occupier of land to prevent the spread of curled dock. Under the Plant Varieties and Seeds Act 1964 the Minister has the power to prohibit the sale of seeds containing more than the prescribed proportion of docks and sorrels.

Further Information and Control

For further information and details of control methods Food DEFRA publish an advisory leaflet "Identification of Injurious Weeds" together with a leaflet on the Weeds Act 1959. A contact address is given at the end of this Appendix.

(iv) Creeping Thistle (Cirsium arvense)

Description



The shoots are produced afresh each season, appearing in late spring as single stems, either flowering or barren and commonly growing up to 1m in height. The flowering stems are shortly branched mostly towards the top. Closely spined leaves are carried on the full length of the stem. The

erect flower heads are grouped in clusters of two to six, they are round or oval with densely packed mauve florets. Each plant bears only male or female flowers, opening from July onwards. The entire stem dies back in late autumn to just below the soil surface.

Legislation

DEFRA has power under the Weeds Act 1959 to require an occupier of land to prevent the spread of the creeping thistle.

Further Information and Control

For further information and details of control methods Food DEFRA publish an advisory leaflet "Identification of Injurious Weeds" together with a leaflet on the Weeds Act 1959. A contact address is given at the end of this Appendix.

(v) Spear Thistle (Cirsium vulgare)

Description

The stem is spiny-winged (not continuously), cottony, furrowed, to 1m high and branched in the upper part. The leaves are low and carry long stout spines. Pale red-purple flowers, 2.5 to 4cms across are solitary or only 2 or 3 in a cluster and borne erect.

Legislation

DEFRA has power, under the Weeds Act 1959, to require an occupier of land to prevent the spread of spear thistle.

Further Information and Control

For further information and details of control methods Food DEFRA publish an advisory leaflet "Identification of Injurious Weeds" together with a leaflet on the Weeds Act 1959. A contact address is given at the end of this Appendix

(vi) Wild Oats (Avena fatua)

Description

In the vegetative stage the wild and cultivated oat species are almost indistinguishable. Wild oats stand out on a verge by growing taller and more vigorously than other plants normally found in verges.

Legislation

There is legislation under a number of Acts which requires that seed shall be free from the seed of wild oat species.

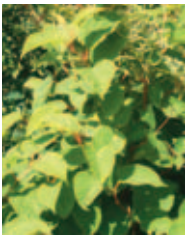
Further Information and Control

For further information and details of control methods Food DEFRA publish an advisory leaflet "Wild Oats". A contact address is given at the end of this Appendix.

(vii) Japanese Knotweed (Fallopia japonica)

Description

Tall vigorous perennial often forming dense thickets: stems stout, somewhat zigzag. Leaves broad triangular. Flowers white in branched spikes.



Legislation

The Wildlife and Countryside Act 1981 makes it an offence to plant or cause Japanese Knotweed to grow in the wild. The Environment Agency publish "Guidance for the Control of Invasive Plants Near Watercourses", which contains useful information on identification and effective treatments.

Further Information and Control

Knotweeds were introduced to British gardens in the nineteenth century for their decorative qualities but often have become pestilential weeds. Japanese Knotweed is probably the worst of all and is now rampant on railway banks, waste areas and some roadside verges. Because of its almost indestructible root system, it is difficult to treat. A degree of eradication may be obtained by applying suitable weed killer (glyphosate), which should be applied twice annually, in spring and late summer. Other invasive Knotweeds can also occur on roadside verges and may require similar treatment.

Information

The Cornwall Knotweed Forum provides an excellent website: www.cornwall.gov.uk/environment/knotweed/cornwall.htm.

The Forum is currently being extended to Devon with the website address www.devon.gov.uk/knotweed.htm.

(viii) Giant Hogweed (Heracleum mantegazzianum)

Description

Starts growing in March-April, reaching 3 to 5 metres in height. The leaves are dark green, in a rosette, lobes deeply cut and spikey at the ends. The stem is dark red-purple spots or blotches up to 100mm across. The flowers are white forming one large umbrella-like flower head that appears in June-July.

Legislation

The Wildlife and Countryside Act 1981 makes it an offence to plant or cause Giant Hogweed to grow in the wild.

Further Information and Control

Giant Hogweed, a native of the Caucasus mountains between Russia and Turkey, was introduced to Britain as an ornamental plant in the late 19th Century. It is now widespread throughout the British Isles especially along river banks.

The control of these plants by non-chemical methods should always be considered as the first option. However, this form of management is often labour intensive and time-consuming. Plants may be dugout, but care should be taken to remove much of the root stalk. Cattle, sheep, goats and pigs are also cited as possible methods of control as they eat Giant Hogweed without apparent harm, trampling also damages the plant.

Chemical control should only be considered only after non-chemical control has been evaluated and has proved impracticable. The herbicide glyphosate is currently the most effective chemical control for Giant Hogweed.

WARNING

The hollow stems are attractive to children who use them as "pea shooters" and "telescopes". However the stems and edges and undersides of the leaves bear small hairs which are coated with poisonous sap and causes blistering and severe irritation. It should not be touched without wearing protective clothing. Giant Hogweed is a potential danger to public health. Seek medical advice if blistering occurs.

(ix) Sources of Advice on Harmful Weeds

Department for Environment, Food and Rural Affairs
Clyst House
Winslade Park
Clyst St Mary
Telephone:01392 447400
Fax: 01392 266000

National Farmers Union
Mr Mike Ellingham,
Senior Technical Adviser
NFU, Agriculture House,
Pynes Hill, Rydon Lane,
Exeter EX2 5ST
Telephone: 01392 440700
Fax: 01392 440701
Email: michael.ellingham@nfu.org.uk

DEFRA Publications

- Weeds Act 1959:Guidance notes on the methods that can be used to control harmful weeds.
  DEFRA 2002 A5 15pp
  PB7190 Free
- Weeds Act 1959: Identification of harmful weeds.
  MAFF 1999 A4 6pp illustrations
  PB4192 Free
- Weeds Act 1959: Preventing the spread of harmful weeds.
  DEFRA 2002 A5 17pp
  PB7189 Free

To order 08459 556000 or
www.defra.gov.uk/environ/weedsact/default.htm

Appendix C - Standard Low Growing Low Maintenance Grass Mix

Only seed of native provenance shall be used.

Hard Fescue	25%
Strong Creeping Red Fescue	35%
Slender Creeping Red Fescue	10%
Smooth Stalked Meadow Grass	20%
Browntop Bent	10%

Appendix D - Special Verge Marker Post and Plate

NOTE: Within the boundary of a National Park metal studs shall be used unless otherwise agreed with The National Park Officer. (See section 9 Special Verges).

Appendix E - Sources of Expert Advice

Devon County Council Environment, Economy and Culture
Lucombe House, County Hall, Exeter EX2 4QW.
Tel: Exeter (01392) 382847
email: hwaymain@devon.gov.uk

Devon County Council Area Contact Telephone Numbers

Area Contact	*Main Office Address*	*Telephone*	*Fax*
East Highway Management	Little Moor House Falcon Road Sowton Industrial Estate Exeter Devon EX2 7PL eastareahm@devon.gov.uk	0845 155 1004	(01392) 381320
North Highway Management	Civic Centre Barnstaple Devon EX31 1ED northareahm@devon.gov.uk	0845 155 1004	(01271) 388490
South Highway Management	Devon House Brunel Road Newton Abbot Devon TQ12 4PB southareahm@devon.gov.uk	0845 155 1004	(01626) 361252

Area Contact	*Main Office Address*	*Telephone*	*Fax*
Dartmoor National Park	Parke, Bovey Tracey, Newton Abbot. TQ13 9JQ	Newton Abbot (01626) 832093	(01626) 834684
Exmoor National Park	Exmoor House, Dulverton, Somerset. TA22 9JQ	Somerset (01398) 323665	(01398) 323150
Network Management Road Safety Group,	Devon County Council Environment Directorate Lucombe House, County Hall, Topsham Road, Exeter, EX2 4QW	Exeter (01392) 382118	(01392) 382135
Network Management Street Works Section	Devon County Council Environment Directorate Lucombe House, County Hall, Topsham Road, Exeter, EX2 4QW	Exeter (01392) 383328	(01392) 382745

Plymouth City Council,
Civic Centre, Armada Way,
Plymouth. PL1 2EW
Tel: (01752) 668000

Torbay Council,
Civic Offices, Castle Circus,
Torquay. TQ1 3DR
Tel: (01803) 201201

Exeter City Council,
Planning Department, Civic Centre,
Exeter. EX1 1JJ
Tel: (01392) 277888
Fax: (01392) 265265

Teignbridge District Council,
Planning Department, Forde House,
Newton Abbot. TQ12 4XX
Tel: (01626) 361101
Fax: (01626) 356803

West Devon Borough Council,
Planning Department, Kilworthy Park, Oaklands Drive,
Okehampton. PL19 0BZ.
Tel: (01822) 813600
Fax: (01822) 813635

South Hams District Council,
Planning Department, Follaton House, Plymouth Road,
Totnes. TQ9 5NE
Tel: (01803) 861234
Fax: (01803) 861177

North Devon District Council,
Planning Department, Civic Centre, North Walk,
Barnstaple. EX31 1EA
Tel: (01271) 327711
Fax: (01271) 388451

Mid Devon District Council,
Planning and Technical Services Department, Ailsa House,
Tidcombe Lane,
Tiverton. EX16 4DZ .
Tel: (01884) 255255
Fax: (01884) 255584

Torridge District Council,
Planning Department, Riverbank House,
Bideford. EX39 2QG
Tel: (01237) 428700
Fax: (01237) 478849

East Devon District Council,
Planning Department, The Knowle,
Sidmouth. EX10 8HL
Tel: (01395) 516551
Fax: (01395) 517509

The Tree Advice Trust/Arboricultural Advisory and Information Service,
Alice Holt Lodge, Wrecclesham,
Farmham,
Surrey GU10 4LH.
Tel: (01420) 22022
Fax: (01420) 22000

Tree Helpline
Tel: 09065 161147 (calls cost £1.50/minute)

Arboricultural Association,
Ampfield House, Ampfield,
Nr Romsey, Hants SO51 9PA.
Tel: (01794) 368717
Fax: (01794) 368978
Email www.trees.org.uk

The Institute of Chartered Foresters,
7A St Colme Street, Edinburgh, EH3 6AA
Tel (0131) 225 2705
Fax (0131) 220 6128
Email: icf@charteredoresters.org
Website:www.charteredforesters.org

Forestry Commission
Mamhead Castle, Mamhead,
Exeter, EX6 8HD
Tel: (01626) 890666
Fax: (01626) 891118
Website: www.forestry.gov.uk

Devon Wildlife Trust
35/37 St Davids Hill
Exeter. EX4 4DA
Tel: (01392) 279244
Fax: (01392) 433221
Email: devonwt@cix.co.uk

Council for the Protection of Rural England - Devon Branch
Mrs Janet Bitmead,
Blackenfield Farm, Luppitt, Honiton
Devon. EX14 1UB
Tel: (01404) 891249
Email: j.bitmead@btinternet.com

English Nature
Devon Team, Level 2 Renslade House, Bonhay Road
Exeter. EX4 3AW
Tel: (01392) 889770
Fax: (01392) 437999
Email: Devon@english-nature.org.uk

British Trust for Conservation Volunteers
171 Sidwell Street, Exeter
Tel: (01392) 666460

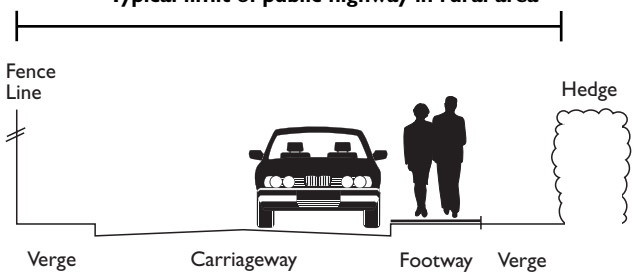
The Community Council of Devon
County Hall, Topsham Road
Exeter EX2 4QB
Tel: (01392) 382533
Fax: (01392) 382062

Devon Conservation Forum,
County Hall, Topsham Road,
Exeter. EX2 4QW
Tel: (01392) 383327
Fax: (01392) 382332
Email: forum@devon.gov.uk

The Tree Council,
51 Catherine Place,
London. SW1E 6DY
Tel: (020) 7828 9928
Fax: (020) 7828 9060

Appendix F - Highway Nomenclature

Typical limit of public highway in rural area



Bibliography

All publications listed contain further sources of information.

BS 3936: Part 1 (HMSO) 1980 (1992) Nursery Stock - Trees and Shrubs Definitions of terms used, dimensions of standard forms (e.g. Standards, Feathers etc). Species and their available forms.

BS 3936: Part 4 (HMSO) 1984 (1989) Nursery Stock - Forest Trees - As for Trees and Shrubs.

BS 3936: Part 10 (HMSO) 1989 (1995) Nursery Stock - Ground Cover Plants Requirements for sizes, root systems, etc.

BS 5837: 1991 (HMSO) Code of Practice for Trees in relation to Construction. Guidance on principles to be followed when planning tree planting on construction sites. New planting, protecting existing trees, maintenance etc.

Collins Guide to Tree Planting and Cultivation. HL Edling., Pub., Collins, London 1972

All aspects of tree growing; planting, maintenance, simple tree surgery, shelter belts, site requirements.

A Field Guide to the Trees of Britain and Northern Europe. A Mitchell, Pub., Collins, London, 1974

Illustrated identification guide.

Detailed description of trees and requirements.

The Trees of Britain and Northern Europe. A Mitchell & J Wilkinson, Pub., Collins, London 1989

Illustrated identification guide including details on height and on locations of fine specimens.

Planting Native Trees and Shrubs. K & C Beckett, Pub., Jarrold, Norwich, 1979

Illustrated guide to native species with distribution map, site requirements, propagation, associated species etc.

Trees in Britain, Europe and North America. Roger Phillips, Pub., Pan Books, London, 1978

Identification Guide, 500 species identified by leaf, flower, fruit, silhouette and bark.

Trees for Town and Country. Brenda Colving, Pub., Lund Humphries, London, 1972

Tree requirements - good guide to sizes attained at different ages.

Shelter Belts and Microclimates. JM Caborn, Forestry Comm. Bulletin No. 29 HMSO, 1957

Design, construction and effect.

Hedging. British Trust for Conservation Volunteers 1998

A Practical Handbook on construction and maintenance of hedges and banks. Details of tools, plant species and wildlife supported by hedges.

Trees and Aftercare, Pub, British Trust for Conservation Volunteers, 1996

A practical handbook dealing with propagation of various trees and shrubs and their aftercare. Includes material published by BTCV in Tree Nurseries (1978).

Arboriculture Research Notes.

Arboriculture Research Notes. Available from Arboricultural Advisory and Information Service, Alice Holt Lodge, Wrecclesham, Farnham, Surrey, GU10 4LH. Tel 01420 22022: Fax O1420 22000

A full index of titles is available. The following are a small example:

27/95/SILS	Herbicides for sward control among broad leaved amenity trees.
59/89/ARB	The effects of weed competition on tree establishment.
40/89/ARB	Tree Staking [revised by S J Hodge].
63/87/SILS	Tree Shelters.
TDA 21	Down the tubes - tree shelter problems.

Devon County Council - Winter Service Plan

Salt storage on roadside verges.

Devon's Hedges - Conservation and Management,

Devon County Council/Devon Hedge Group, Pub., Devon Books, 1998

Forestry Commission Research Information Note 195

The Establishment of Trees in Hedgerows

Forestry Commission Practice Guide

Hazards from Trees - A General Guide

Forestry Commission

Handbook 7 - Tree Shelters - M.J.Potter 1991

A summary of the policies adopted by Devon County Council, following recommendations made by a Working Party appointed to look into all aspects of the treatment of urban and rural roadside verges.

Printed on recycled paper

EIGHTH EDITION
(updated July 2010)

Devon
County Council