EXTRACT FROM THE CODE OF PRACTICE FOR HIGHWAYS MAINTENANCE MANAGEMENT

Section 13

Winter Service

Section Amended
29 November 2011

13.1 INTRODUCTION
Background
13.1.1 Although sometimes termed "Winter Maintenance", the particular network management requirements during winter are not "maintenance", in the traditional sense, but specialist operational services. The term "Winter Service" has been adopted by this Code.
13.1.2 Winter Service deals with regular, frequent and reasonably predictable occurrences like low temperatures, ice and snow, as well as with exceptional events. Whist the effects of climate change are likely to result in an increased frequency and intensity of severe winter events, these can be taken into account in Winter Service planning. Therefore Winter Service can and should be subject to the same regime of plan, deliver, review and improve as other aspects of the highway maintenance regime.

13.1.3 Policies and plans developed for Winter Service are likely to have relevance in emergency planning for dealing with extreme weather conditions including flooding, high winds and high temperature, as discussed in Section 14 of this Code. The incidences of such events may be affected by climate change. They are also likely to have some relevance to the wide range of non-weather related emergencies that could affect the highway network.

13.1.4 Although a very specialised area, Winter Service is a significant aspect of network management both financially and in terms of its perceived importance to users. It can also have significant environmental effects. The organisation of the service is likely to have considerable implications for the overall procurement and management of other highway maintenance services. This Section of the Code should therefore be read in conjunction with other sections dealing with these issues and Appendix H.

Objectives
13.1.5 Winter Service can contribute significantly to each of the core objectives set out in this Code as described below:

Customer
 There are, in all parts of the UK, very considerable user needs and expectations and these can be a major influence on customer satisfaction through demonstrating an efficient, effective and proportionate response to winter conditions.

Safety
 Safety is a consideration for Winter Service, even though statutory obligations and users needs vary in different parts of the UK.

Serviceability
 Maintaining availability and reliability of the highway network is a key objective for Winter Service and one where user judgements of performance will be immediate rather than longer term.

Sustainability
 Low temperatures and the formation of ice can cause serious damage to the fabric of running surfaces and accelerated damage of the network. Effective Winter Service can contribute to a reduction in whole life costs and minimise damage to the environment.

Statutory Basis
13.1.6 The statutory basis for Winter Service varies in different parts of the UK. In England and Wales Section 41 (1A) of the Highways Act 1980 was modified on 31st October 2003, by Section 111 of the Railways and Transport Act 2003. The first part of Section 41 now reads:

"a) The authority who are for the time being the highway authority for a highway maintainable at the public expense are under a duty, subject to subsections (2) and (3) below, to maintain the highway.
b) (1) In particular, a highway authority are under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice."
13.1.7 This is not an absolute duty, given the qualification of "reasonable practicability" but it does effectively overturn previous legal precedence, albeit not with retrospective affect. Section 150 of the Highways Act 1980 still imposes a duty upon authorities to remove any obstruction of the highway resulting from *"accumulation of snow or from the falling down of banks on the side of the highway, or from any other cause"*.

13.1.8 In addition, the Traffic Management Act 2004 placed a network management duty on all local traffic authorities in England. It requires authorities to do all that is reasonably practicable to manage the network effectively to keep traffic moving. In meeting the duty, authorities should establish contingency plans for dealing promptly and effectively with unplanned events, such as unforeseen weather conditions, as far as is reasonably practicable.

13.1.9 Given the scale of financial and other resources involved in delivering the Winter Service it is not reasonable either to:

 provide the service on all parts of the Network;
 ensure running surfaces are kept free of ice or snow at all times, even on the treated parts of the network.

13.1.10 In Scotland statutory responsibilities are defined by Section 34 of the Roads (Scotland) Act 1984 which requires that "*a road authority shall take such steps as it considers reasonable to prevent snow and ice endangering the safe passage of pedestrians and vehicles over public roads*".

13.1.11 In Northern Ireland, the Roads (NI) Order 1993 SI 1993/3160 (NI 15) provides, in Article 10, a duty for the Department of Regional Development to "*remove snow, soil etc which has fallen on a road*". Section 9 of the Order also enables the authority to "*take such action as it considers reasonable to prevent snow or ice interfering with the safe passage of persons and vehicles using the road*". However paragraph 7 of Article 110 provides protection from liability and states that "*Nothing in this Article operates to confer on any person a right of action in tort against the Department for failing to carry out any duty imposed on it under the Article*".

13.2 WINTER SERVICE POLICY

13.2.1 Authorities should formally approve and adopt policies and priorities for Winter Service, which are coherent with wider objectives for transport, integration, accessibility and network management, including strategies for public transport, walking and cycling. They should also take into account the wider strategic objectives of the authority.
(Recommendation 1)

13.2.2 Issues for consideration in developing policy should include:
- treatment of facilities for public transport users;
- treatment of facilities for road users;
- treatment of facilities for walking and cycling;
- treatment of transport interchanges;
- treatment of promoted facilities;
- extent of priority for emergency services;
- extent of priority for key public services and critical infrastructure;
- extent of priority for vulnerable users;
- level of service resilience required;
- other local circumstances.

13.2.3 Authorities should develop service standards for Winter Service which define the Overall Winter Period, the Core Winter Period, the level of resilience and treatment networks.

13.2.4 These policies and service standards should be developed as far as reasonably possible with users and key stakeholders and should also be based on a risk assessment to define the scope of the service. The documents should be designed and drafted to be used by staff at all levels. Authorities should utilise the time outside the winter season to put these policies and plans in place.

13.3 RESILIENCE

13.3.1 Better planning will result in a more resilient Winter Service and reduce the risk in the delivery of the service during normal and severe winter conditions. It also has the potential to deliver the service in a more efficient way. This includes not only the management of salt stocks, but other resources such as fuel, plant and labour.

13.3.2 Winter service should be regarded as part of the authority"s wider resilience planning. The same disciplines, systems and processes apply, bringing a degree of rigour and challenge to the preparation of plans for winter weather.

13.3.3 The first step towards providing a more resilient service is consideration of the threats and vulnerabilities of the service. This can be achieved through a detailed appraisal of the current situation based on plausible but stretching „what-if" scenarios.

13.3.4 By considering these scenarios, potential areas for improvement in service resilience can be identified. These should be assessed, prioritised and mitigation measures

considered. It is important when considering potential mitigation to think laterally, as this may identify more cost effective solutions.

13.3.5 An important part of resilience planning is to include a planned escalation procedure. Engagement with the authority‟s emergency planning department should be considered. The Winter Service Plan should be made available to the authority‟s emergency planning departments such that it can be integrated with other plans such as Business Continuity Plans, Evacuation Plans and Rest Centre Establishment Plans.

Minimum Winter Networks

13.3.6 As part of their contingency planning, authorities should define a minimum winter network. This resilience network may be a subset of their normal treatment network and should provide a minimum essential service to the public, including links to the strategic network, access to key facilities and other transport needs. It is important that there is continuity across boundaries. It is recognised that authorities will have difficulty in treating all bus routes. However, arrangements should be made to enable bus operators to run minimum services.

13.3.7 Issues to consider when defining a minimum winter network are:

 What is the key infrastructure access which should be maintained? To this end, the authority‟s emergency planning department should be consulted. Consideration should be given to a wide range of services, including consideration for private infrastructure. For example, water treatment works may require chemical deliveries to ensure continuity of water supply but are unlikely to be on the primary treated road network.

 How will carriageways, cycle ways and footways be prioritised across the authority‟s network? Issues to be considered include treatment methods, resource requirements, type of network as a whole and alternative routes or modes of transport.

 How will the minimum winter network interface with other authorities? There is little point expending effort to keep a route open if it is snowbound in a neighbouring authority.

13.3.8 Treatment of the resilience network in practice should be considered, as the possibility of slower treatment speeds and potential congestion may create issues.

13.3.9 The trigger point and protocol for activating the minimum winter network should be agreed within the authority, documented and communicated as appropriate. In doing so agreement should be made with the emergency planning department and senior officers.

The decision to activate the minimum winter network may also be made in conjunction with other authorities. The overall approach should be detailed within the Winter Service Plan.

Winter Resilience Standard

13.3.10 Authorities should consider, consult on and formally adopt local service standards for resilience of their winter service in terms of number of days continuous severe conditions salting on a defined Minimum Winter Network for the Overall Winter Period and for the Core Winter Period. **(Recommendation 2)**

13.3.11 A resilience benchmark of 12 days/48 runs should be adopted for full pre-season salt stockholding by 1 November for English local highway authorities. **(Recommendation 2a)**.

13.3.12 In considering how to apply the benchmark, authorities should review their history of usage and mutual aid or other arrangements to consider: a) whether there is a case for increasing capacity towards 48 runs if it is currently less than this, in addition to filling the capacity they have; or b) at what level to stock – at or above the 48 runs level – where the capacity exists to do so.

13.3.13 Establishing a winter service resilience standard requires consideration of the number of days resilience to be adopted, definitions of the Overall Winter Period[1] and Core Winter Period[2], whether it should refer to the normally salted network or to a smaller locally determined Minimum Winter Network[3].

13.3.14 Delivery of the Winter Service relies on suitable resources being available, including salt, fuel and trained staff and operatives. Any one resource in short supply puts additional strain on service delivery.

13.3.15 It is suggested that at least 6 days resilience for salt and other resources, including equipment, drivers and fuel, would represent sensible good practice for determining the number of days‟ resilience during the Core Winter Period. This is based on a number of days‟ severe conditions plus replenishment time and taking into account weekends, and combinations of public holidays and weekends such as Christmas and the New Year.

13.3.16 This approach based on a reasonable number of days‟ resilience in the ability to deliver a defined winter service should ensure that highway authorities hold or have easy guaranteed access to sufficient salt, gritters and drivers and other essential resources to deal with severe winter weather conditions.

13.3.17 Some highway authorities may already have a good level of resilience, but if individual authorities decide they need to increase resources, they will need to consider the practical implications and a reasonable implementation period. Implications may include any new arrangements or facilities required and cost.

13.3.18 In developing their local service standards based on days‟ resilience, authorities should assess the risks that are faced in the delivery of the Winter Service. The assessment should cover all items of policy and management including:

- network for treatment;
- adjoining highway networks;
- salt management policies;
- operational resources (including equipment, salt stocks and fuel);
- access to Winter Service depots and salt storage areas;
- staff training;
- availability of operational staff.

1 Overall Winter Period – Locally defined since the winter period may vary according to climatic conditions, but usually at least the beginning of October to end of April.
2 Core Winter Period – Locally defined since the winter period may vary according to climatic conditions, but usually at least December to February inclusive.
3 Minimum Winter Network – That part of the carriageway network normally treated in winter which provides a minimum essential service to the public, including strategic routes, access to key facilities and other transport needs.

13.3.19 An example of how authorities may express and apply their Winter Service resilience standard is included in Appendix H.

13.3.20 The Department for Transport has put in place a year- round salt stock monitoring system to ensure optimum resilience of salt supply, through a nationally severe winter. Authorities should provide to the Department for Transport the information required for this system in a timely manner.

13.4 CLIMATE CHANGE

13.4.1 It is now acknowledged that the world is experiencing a rapidly changing climate. It is generally accepted that although weather is likely to be milder and wetter in winter, there may be more occurrences of severe weather events.

13.4.2 The effects of climate change make it difficult for highway authorities to anticipate winter conditions from year to year. Wide variation and extreme events as a consequence of climate change needs to be taken into account in winter service planning. The events of the 2008/09 winter provide evidence of what can happen and are reviewed in detail in the UKRLG report Lessons from the Severe Weather February 2009. The report may be downloaded from the following website:

Website Amended
27 April 2012
http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=7E330478-F948-42A3-93F8B3A4862AA655

13.4.3 In 2009/10 the UK was hit by the coldest and most extended winter for thirty years. An independent review has been carried out of the resilience of England‟s transport systems to severe winter weather. The final report has been published, making recommendations for improving transport systems‟ resilience to severe winter events. The UKRLG supports the recommendations of this report. The final report may be downloaded from the following website:

http://transportwinterresilience.independent.gov.uk/docs/final-report/

13.4.4 The Secretary of State for Transport responded to the final report. The response may be found in the following website:

Website Amended
27 April 2012
http://www.dft.gov.uk/news/statements/hammond-20101022/

13.4.5 The Transport Select Committee published a report in April 2011 entitled; Keeping the UK moving: The impact on transport of the winter weather in December 2010. The document can be downloaded from the following website:

http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/794/79402.htm

13.4.6 Authorities should review their approach to climate change and in particular their resilience to prolonged cold weather. **(Recommendation 3)**

13.4.7 Climate change is dealt with in more detail in Section 14.1.

13.5 CO-ORDINATION AND COLLABORATION

13.5.1 Authorities should consider whether collaborative arrangements such as shared services, lead authority arrangements, collaborative service procurement, and sharing depots and salt stock, would provide an effective and value for money approach to increasing winter service resilience. **(Recommendation 4)**

13.5.2 Co-ordination and co-operation between authorities in winter service planning including defining treatment routes, response, and treatment times is of crucial importance. This should be a formal process between the adjoining local authorities and with the authority responsible for the strategic network. The intention should be to negotiate effective

service integration across administrative boundaries and to enable operation of the plant and vehicles required to achieve adequate resilience.

13.5.3 In these circumstances close liaison both with public transport operators and local authority transport co-ordinators is essential, at the annual review, on an ongoing basis throughout the season and on a continual basis in severe weather conditions. This is particularly important as, although changes to public transport routes and frequencies will be made throughout the season, it will not usually be practical or desirable for consequent changes to the treated network during the season. This may influence the nature and timing of changes to public transport routes.

13.5.4 The efficient operation of many essential services may be dependent upon ice or snow removal from key areas of private land, which is fundamentally the responsibility of land owners.

13.5.5 Authorities should determine critical areas and infrastructure in conjunction with key public services and other stakeholders and seek to ensure that appropriate winter treatment has been considered by the appropriate party. (**Recommendation 5)**

13.5.6 Authorities should explore the potential for sharing depots as this may provide opportunities for efficiencies. Other areas where collaboration should be considered include decision support services for weather particularly where authorities have similar climatic conditions.

13.6 WINTER SERVICE PLANNING

13.6.1 Planning and preparation is fundamental to delivering a successful Winter Service. Careful planning in advance of the winter season will greatly assist in adequate resources and contingency arrangements being put in place by authorities to improve their overall resilience.

Communication

13.6.2 It is good practice to communicate effectively with the public, key public services, stakeholders and other highway authorities. However, communication within the authority is also critical. Preparation and planning of communication in advance will assist in the effective delivery of the service.

Setting Expectations

13.6.3 It is important to ensure that the public, elected members and senior management are engaged in the Winter Service. The Department for Transport (DfT) has produced a leaflet titled “Are You Ready for Winter?” with important information for councillors and senior officers about preparation for winter. Public leaflets, websites and briefing notes all contribute to setting expectations with a low associated cost and time requirement.

13.6.4 Clearly setting out what will and will not be done as part of the delivery of Winter Service can reduce the number of complaints and questions raised by the public and stakeholders. Improved communication and understanding may therefore improve time available for the Winter Service delivery team to focus on delivery of the service.

Collaboration and Liaison with Stakeholders

13.6.5 It is important to remember that members of public will travel across boundaries of several different authorities. It is therefore important that treatment regimes align across boundaries to provide a seamless service. Simple measures such as comparing treatment

routes and decision making criteria between authorities will assist with this, especially within urban areas.

13.6.6 Authorities should ensure that there is appropriate consultation and communication with other highway authorities, key public services and other stakeholders to ensure improved service for the public. **(Recommendation 7)**

13.6.7 It is important to provide information directly to key stakeholders, including adjacent highway authorities, all emergency services, public transport operators, motoring organisations, the education authority, schools, their bus operators, and key local organisations. This information could include:
- Sharing Winter Service Plans;
- A non-technical summary of the Winter Service Plan;
- Maps of treatment routes;
- Operational decisions on a timely basis.
- Salt stock information via the Salt Portal

13.6.8 Liaison between highway authorities should be routine throughout the winter season. Communication of treatment decisions provides useful information that may inform future decision making, promotes seamless service and can potentially generate efficiency savings.

13.6.9 Collaboration with other authorities can be as simple as arranging an informal meeting to discuss the respective Winter Service policies and plans on an annual basis. Other topics could include resource availability, mutual aid or joint training and exercising.

13.6.10 It is good practice to liaise with the relevant trunk road and motorway operator (where appropriate) to confirm current route planning. This will minimise duplication of treatments where the two networks cross and avoid sections being missed at complex intersections.

13.6.11 There are many examples of good practice where authorities have worked together in preparation for the winter season. In London, for example, all highway authorities and other stakeholders have collaborated to produce a contingency plan, agree a resilience network, and put in place a strategic stockpile of salt.

Contact Information
13.6.12 Staff contact details and other stakeholders involved in the Winter Service need to be updated before the start of the winter season. A contact check is a simple and effective means of ensuring that staff can be contacted when required. The contact check also facilitates a refresh of communications with other authorities and stakeholders.

Media Information
13.6.13 Authorities should establish effective working arrangements with local press and broadcast media. This should enable the presentation of timely and accurate information and advice on network condition and use. Information could include travel information, network availability and risk of severe conditions such as snow and black ice. These arrangements should include in-season proactive media output to engage the public with the Winter Service. This is especially important during prolonged cold weather and is likely to involve television, radio and the internet. Local radio in particular considers this to be a most important aspect of their service to the community and it therefore provides the opportunity to build good working relationships over wider issues. Many authorities have specialist press and public relations personnel and it will be important to clarify and agree respective service and specialist responsibilities.

13.6.14 Whilst every severe weather event poses its own unique issues, the baseline media information required remains relatively constant. Statistics such as the number of spreaders, ploughs and salt stored are popular requests. The structure of messages to be relayed is generally similar.

13.6.15 Robust processes should be in place to ensure a rapid and accurate issue of media information is possible. It is suggested that pre-prepared media briefs are developed in advance of the winter season for use during times of severe weather.

13.6.16 It is important to define and agree key contacts with press and broadcast media and also establish a clear understanding of the most effective timings for information to be provided, in order to reach necessary audiences and broadcast schedules. It may be helpful to arrange joint workshops or training sessions to build understandings and relationships. Advance compilation of commonly requested information will reduce the media workload during a severe weather event.

13.6.17 There may also be a need in more widespread and extreme conditions to provide information to the public using national press and broadcast. This may be undertaken either directly or by arrangement with local media, and arrangements should be discussed with them. It may also be possible to utilise variable message signs.

13.6.18 Where possible authorities should use their media relations staff to prepare generic statements and press releases for rapid issue at the onset of winter conditions. These can be pre-approved for use during periods of severe conditions, when both Winter Service delivery teams and the press team will be busy. Consequently authorities may identify the need to provide media training to winter staff. This will help to ensure that the right message is put across in the correct manner at all times.

13.6.19 When severe weather is forecast the media rapidly start requesting information and it is important that correct and accurate information is available to them. If information is not provided by an authority the media will attempt to source it from elsewhere, which may not be accurate.

13.6.20 Recent experience has shown that some individuals will take heed of advice issued to the public for or avoiding travelling during severe conditions. If sufficient advanced warning is provided, drivers will be able to change their plans.

Information for the Public

13.6.21 Authorities should ensure effective communication of information for the public before and during both normal and severe winter conditions. **(Recommendation 6)**

13.6.22 Authorities should make widely available for users and the community a non-technical summary of the Winter Service Plan, including plans of the treated network, together with guidance on safe use of the network. They should also establish arrangements for local radio and web based information.

13.6.23 Section 6 of this Code deals with arrangements for community involvement in highway maintenance and the importance of information and publicity. This provides opportunities and challenges, which should be positively addressed by authorities and provide an important opportunity to demonstrate understanding of users" needs, and a strong service commitment.

13.6.24 It is of crucial importance that policies and standards of Winter Service provided by authorities are widely available and understood by users and the community. As far as possible highway users should be made familiar with treatment routes, particularly in severe

weather conditions. This will help in ensuring that expectations are realistic and consistent with the resources available as well as maintaining public safety.

13.6.25 Many authorities provide leaflets summarising policies and service standards, including maps showing routes treated, contact information and advice on safe network use. The leaflets should be reviewed annually and made available through the internet, libraries, information centres, schools and a wide range of outlets. Further details on the content and use of leaflets are included in Appendix H.

Public Self Help

13.6.26 Guidance to the public has been published by DfT on how they can assist their communities in clearing snow and ice without fear of litigation.

http://www.direct.gov.uk/en/Nl1/Newsroom/DG_191868

13.6.27 Many authorities have provided salt bins and shovels to parish councils and other stakeholders in order to help them keep local areas free of ice and snow. Ensuring suitable risk assessments and method statements are in existence will minimise the risk of accidents occurring.

13.6.28 Local volunteer groups may provide support to local communities and the vulnerable for clearing footways. This needs careful management to ensure the safety and welfare of all involved. This is an area that emergency planning departments are likely to have experience of, either directly or through involvement with Local Resilience Forums.

13.6.29 One means by which authorities can assist the local community in areas not on priority routes or at known trouble spots, including gradients and sharp bends is by the provision of public access salt bins. Where these are provided authorities should make arrangements for their replenishment as necessary and to ensure that they do not become unsightly or used for the unauthorised disposal of waste.

Winter Service Plan

13.6.30 It is important that the Winter Service Plan is designed to be used by staff at all levels and that those that require it have ready access to the document.

13.6.31 Authorities should formally approve, adopt, and publish, in consultation with users and key stakeholders, a Winter Service Plan based on the principles of this Code. **(Recommendation 8)**

13.6.32 Once the policy and plan documents are complete, it is important that those involved in delivering the Winter Service are aware of the current approach. Ideally, a briefing should take place at the start or early in the season to disseminate this information to staff involved in the delivery of the Winter Service. The briefing should also remind staff of the critical role they play in mitigating the impact of winter weather on the road network.

13.6.33 The Winter Service Plan should be reviewed annually in consultation with a wide range of stakeholders.

13.6.34 It is good practice to monitor compliance with the Winter Service Plan throughout the season. Simple audits on decisions made and short debriefs of snow events will achieve this. These audits should be regular and clearly documented to ensure maximum benefit can be achieved.

13.6.35 Suggested contents of the Winter Service Plan are detailed in Appendix H. The Plan should recognise the fundamental differences between the main components of Winter

Service for carriageways, cycle routes, footways and any critical areas and infrastructure as follows:
 pre-treatment - “precautionary” salting;
 post-treatment - continuing salting following the formation of ice;
 clearance of ice and snow;
 dealing with continuous severe conditions.

Treatment Routes
13.6.36 Authorities should define treatment route plans for carriageways, cycle routes and footways for pre-treatment and snow conditions, based upon the general maintenance hierarchy, but adapted to take into account the factors identified by this Code.
(Recommendation 9)

13.6.37 The treatment routes for Winter Service should take as a starting point the hierarchy developed for other maintenance purposes but this is likely to require extensive modification to consider:
 wider transport and other policy priorities referred to above;
 special requirements of carriageways, footways and cycle routes;
 safe and reliable access to emergency facilities including Fire and Rescue, Police, Ambulance Services and hospitals;
 other public services access needs and critical infrastructure where the maintenance of access may be critical;
 public transport routes and access to stations, bus garages and depots;
 safe and reliable access to main industrial and business centres of key importance to the local and regional economy;
 any significant variation between summer and winter traffic;
 accessibility dependencies of remote communities for example Scotland‟s island and peninsular communities;
 the special needs of disabled people or older people particularly where these can be effectively targeted;
 known problems, including significant gradients, exposed areas and other topological factors;
 climatic and thermal capacity differences within the area;
 co-ordination and co-operation with other authorities.

13.6.38 Consideration of these issues is likely to suggest differences in networks adopted for each element of Winter Service. Such decisions will usually not be clear cut. For example treatment of footways will differ from carriageways and for low traffic roads it may be difficult to justify high priority for service provision.

13.6.39 Risk assessments should be undertaken to establish which routes should be included in a programme of treatment during winter. In particular, the treatment of carriageways, footways and cycle routes must be considered taking account of risk to all highway users and consideration of the available resources.

13.6.40 Where the authority is actively promoting facilities, or there are clear trends of increasing use, a more proactive approach to Winter Service may send an important message.

13.6.41 Transport interchanges perform a key role in the delivery of integrated transport, which should be reflected in Winter Service policies and priorities. These include airports, rail and bus stations and the means of access to them whether by main routes for walking, cycling, public transport or car. Parts of the interchange may be subject to differing management regimes and it will be important to agree common standards and ensure effective co-ordination of resources.

13.6.42 It should be recognised that many authorities will have difficulty treating all bus routes as part of their precautionary salting routes. The treatment of bus routes should be based on risk assessment of local circumstances such as service frequency and their importance to integrated transport services. It is important that treatment routes include the access roads to bus garages.

13.6.43 Similar considerations apply to school bus routes where, although authorities should endeavour to provide Winter Service support, there may be practical difficulties in wide spread treatment of such a diverse network.

13.6.44 In general salting should not be undertaken between the stop lines of level crossings, even when covered with snow. Before ploughing over a level crossing the driver must stop and telephone the signalman for permission to proceed and then inform the signalman when past the crossing. Snow blowers must not be used on level crossings.

13.6.45 Consideration should be given in certain circumstances for the temporary erection of snow fencing to reduce the effect of drifting snow. The legal powers to provide snow fences in England and Wales are contained in Section 102 of the Highways Act 1980. Where no agreement can be reached with the landowner, Sections 239, 240 and 250 of the Act provide for compulsory powers. The power to provide snow fences in Scotland is in Section 30 of the Roads (Scotland) Act 1984. There is no equivalent of these specific powers in Northern Ireland but Article 100 of the Roads Order, which deals with the acquisition of land, could be used in these circumstances.

13.6.46 In periods of especially severe weather in certain parts of the UK, temporary road closures may be necessary. Where roads are known to be particularly vulnerable consideration should be given to the installation of permanent flap down or variable message signs. These signs should be located well in advance of any anticipated obstruction and should be operated in conjunction with the Police. In determining the optimum location consideration should be given to the availability of alternative routes and, if necessary, holding areas. With manually operated signs, and in more remote areas, it is essential that the signs are easily accessible and can be quickly operated by authority or police to give timely information. Consideration should be given to the merits of remotely controlled matrix signing.

Contingency Planning

13.6.47 Winter Service procedures should be designed to provide a planned response during even exceptionally severe weather. Through careful planning it is possible to reduce the need for reactive response. It is important to ensure that the Winter Service Plan contains details of the escalation procedures, alternative resources and minimum winter (resilience) networks.

13.6.48 The delivery of a more resilient Winter Service should enable local communities, business, public transport and emergency services to function in more severe conditions prior to the need to implement contingency arrangements. Effective contingency planning is therefore a key element of delivering a more resilient service.

13.6.49 Authorities should prepare contingency Winter Service Plans for severe weather conditions which include possibilities such as salting a Minimum Winter Network. Authorities should seek agreement on plans in advance with other highway authorities and key public services such as hospitals and public transport providers. There should be a co-ordinated approach to implementing Minimum Winter Networks across adjacent highway authorities. **(Recommendation 10)**

13.6.50 When weather is sufficiently severe, a contingency plan should be activated. The success of this plan is dependent on advance planning and co-ordination, including treatment routes, resource needs, mutual aid and communications.

13.6.51 With improved resilience of Winter Service the normal response is likely to cope with more severe conditions before the need for escalation. Once escalated, the response will then be likely to mitigate the effects of more extreme conditions. Providing winter decision makers with well designed contingency arrangements allows them to escalate an issue before it becomes a significant threat to continuity of service and to have the tools available to best manage the situation.

13.6.52 When resilience measures and processes have been developed and incorporated into the Winter Service Plan, relevant staff and stakeholders will need to be trained. Resilience planning should be tested through exercises. This will resolve any potential problems in the approach prior to it being used operationally.

13.6.53 Local authorities, as Category 1 responders under the Civil Contingencies Act 2004, will already have emergency plans in place. Authorities should benefit from these plans in developing a more resilient approach to Winter Service. Business continuity planning with respect of severe conditions is also important to ensure that winter service can be delivered and other critical functions can be adequately supported.

13.6.54 As part of their contingency planning, authorities should define a Minimum Winter Network, see recommendation 2. This may be a subset of their normal treatment network and should provide a minimum essential service to the public, including links to the strategic network, access to key facilities and other transport needs. It is important that Minimum Winter Networks ensure continuity across boundaries. It is recognised that authorities will have difficulty in treating all bus routes as part of their minimum network. Minimum Winter Networks should however enable bus operators to run minimum services, as appropriate.

13.6.55 Resources such as salt, fuel, spreaders, depots and labour are finite. Plans therefore need to demonstrate how the service will be delivered if one or more of these resources is in short supply. Shortages of fuel, spreaders or operators may not coincide with severe weather.

13.6.56 Where practicable, authorities should make arrangements for obtaining reserve supplies of key resources to support their minimum resilience standard. This should include salt, fuel, power and labour.

13.6.57 Mutual aid is a pre-agreement between one or more organisations to assist each other, as far as practicable, to overcome disruptive challenges. Mutual aid between authorities is often used in the response to “wide” area emergencies, as the impact on the local authorities, emergency services and other resources can be overwhelmed. Sharing, e.g. depots and salt stocks, through mutual aid may be helpful. Where planning to do so authorities should make contingency arrangements in advance. Mutual aid can be an informal or formal process having written agreements. Arrangements are usually between organisations that work closely together on a regular basis or as part of local resilience forums. Both approaches work well if they are flexible enough to change in response to the dynamics of a situation. Guidance on mutual aid may be found at: http://www.cabinetoffice.gov.uk/resource-library/short-guide-local-authority-mutual-aid

13.6.58 Authorities should explore the potential for mutual aid in salt supply and other aspects of winter service and should make contingency arrangements in advance. **(Recommendation 11)**

13.6.59 During a salt shortage there may be various potential mechanisms to reduce salt consumption bearing in mind the issues discussed in Appendix H. Each has its own implications which the authority must carefully consider prior to implementation.

13.6.60 In 2009 CSS (now ADEPT) published advice for its members on how to help preserve salt stocks during periods of severe winter weather, in order to ensure that essential services can be maintained. The advice may be downloaded from the following website:

http://www.lga.gov.uk/lga/aio/1584225

13.6.61 During a severe weather event increased levels of communication are likely to be required. Communication during a „crisis" is not simply about media output. Proactive internal communication and keeping the numerous stakeholders informed is also critical. It is important to ensure that good communication is achieved both with internal staff and external stakeholders. Media liaison is relatively straightforward task once suitable contacts are made. The use of authority websites is a good way to get accurate information to the public without reliance on the media.

13.7 WINTER SERVICE DELIVERY

Decisions and Management Information

13.7.1 Authorities should take full advantage of decision support systems and services to enable timely, efficient and accurate decision making. **(Recommendation 12)**

13.7.2 Decision support systems and management information are the basis of effective Winter Service delivery. More details are given in the *ICE Design and Practice Guide, Highway Winter Maintenance* published in 2000.

13.7.3 Systems will use current information and trends in conjunction with relevant software to extrapolate and display predicted conditions over a range of periods.

13.7.4 The decision support information will be used by the authority"s designated Winter Service controller, or similar, together with local experience, and against the background of a range of pre-determined scenarios, in deciding the action to be taken. The decision should usually be delegated to a single person, although in larger authorities with varying climatic conditions the role may be delegated to two or more persons. Controllers will of course need to maintain close consultation with others both within and adjoining the authority and also those dealing with the strategic network.

13.7.5 Information to aid decision making is included in Appendix H.

13.7.6 The quality of decisions made by the controller will be the key factor in determining both the effectiveness of the Winter Service and also how it is perceived by users and the community. Instigating a decision check process ensures high quality decisions are acted upon and is good practice.

Information Recording and Monitoring

13.7.7 Authorities should continually monitor performance during service delivery and respond effectively to changing conditions or network incidents. **(Recommendation 13)**

13.7.8 Comprehensive and accurate records should be kept of the all Winter Service activity, including timing and nature of all decisions, the information on which they were based, and the nature and timing of all treatment. Note that time taken running dead mileage at end of salting run is not included in treatment time. It is preferable to record both the time at the end of actual salting and the time of return to depot. Where the dead mileage at the end of a

salting run is significant this should be considered when planning for severe conditions as it will prevent rapid redeployment of resource.

13.7.9 Authorities should make use wherever possible of electronic vehicle location systems together with automatic recording of salt spreading. This will simplify and improve the accuracy of records as well as provide corroboration of service delivery in cases where failure to salt is alleged.

13.7.10 The condition of routes should be monitored following treatment in order to confirm that the treatment has been effective. If it has not been fully effective, contingency treatments should be considered to achieve the required condition. It should be noted that both active and passive road weather sensor systems require the presence of moisture to determine either the concentration of an anti-icing chemical on the road or the freezing point temperature of the solution present on the road sensor.

Resources

13.7.11 Winter Service requires numerous staff, a significant amount of plant and large volumes of consumables such as salt for de-icing and fuel. It is important that supplies and suppliers are planned and managed to ensure these resources are available when required. Sufficient trained and experienced staff are required for the delivery of an effective Winter Service. This includes winter managers, decision makers, supervisors, spreader drivers and other equipment operators.

13.7.12 Authorities provide Winter Service through combinations of their own resources and those of service providers contracted to them. There is a wide variety of approaches. Many highway authorities provide some of their own facilities with others provided by the private sector. In all cases, service providers‟ activities are governed by their contract with the highway authority.

13.7.13 In some authorities refuse collection, street cleansing and grounds maintenance services often provide support to the Winter Service, especially in times of prolonged ice and snow. Arrangements should be made and documented well before the commencement of the season.

13.7.14 Detailed route planning and for each aspect of Winter Service will need to be optimised to ensure economic, efficient and effective resource allocation. This will depend on:

- spreading vehicle characteristics and capacity;
- depot and salt location;
- Response times (the period between decisions being taken to begin treatment and vehicles leaving the depot. It is suggested that authorities should adopt a target response time of no more than one hour. This should apply both within and outside normal working hours);
- Treatment times (the period between vehicles leaving the depot and the completion of treatment on all priority routes. Authorities should adopt target treatment times based on risk assessment of local circumstances that provide for the completion of pre-treatment before ice forming. They should however recognise however that treatment times might vary in different weather conditions).
- Turnaround times (the period between a vehicle completing salting on its route and being ready to recommence salting having reloaded at the depot)

13.7.15 A key factor in ensuring that response and treatment times are met once a decision has been taken to treat is the availability of appropriately trained personnel. Identifying the extent of resources needed under various scenarios and the potential source of these will be

an important aspect of pre-season planning. This planning should cover the whole range of requirements and conditions likely to be encountered, including:
 Pre-season preparation;
 Precautionary treatment;
 Footway and cycle route treatment;
 Post treatment;
 Snow clearance;
 Continuous severe conditions;
 Post snow emergencies (flooding etc).

13.7.16 Planning of resources should cover the entire workforce involved in the Winter Service. It is particularly important not to overlook:
 the need for staff to be available throughout defined risk periods;
 the need for the treatment operations to be co-ordinated and supervised;
 resources and equipment for treating carriageways, footways and cycle routes;
 resources for dealing with vehicle breakdowns, problems with fuel supply and communications failure;
 resources for the storage, delivery and loading of salt.

13.7.17 In planning resources the following issues regarding personnel also need to be addressed:
 implications of Drivers" Hours Regulations;
 extent and nature of double manning and driver support;
 shift system arrangements;
 provision for holidays and sickness.

13.7.18 It is important that a realistic assessment of the resources required has been made to ensure the continued treatment of the Minimum Winter Network during exceptional conditions. Authorities in planning their resources should ensure that they are compatible with the wider resilience standards adopted by the authority.

13.7.19 Authorities often place reliance in times of prolonged ice and snow on temporary contracts with contractors, farmers and others to supplement resources for snow clearing. Arrangements should be documented and it is important to ensure that the necessary insurance cover is in place.

13.7.20 In rural areas, authorities should examine the potential for using local council snow wardens, who may have an effective role in gathering information and providing Winter Service Managers with details of specific local problems. If snow warden schemes are adopted clear terms of reference should be established.

Training and Development
13.7.21 Ensuring adequately trained and experienced staff is key to successful delivery of Winter Service.

13.7.22 To ensure appropriate level of competence, training and development needs of all personnel should be established and reviewed annually, including health and safety and appropriate vocational qualifications. Training should then be provided where appropriate before the Winter Service season. **(Recommendation 14)**

Training
13.7.23 Delivery of a successful Winter Service is dependent on the individual decisions made and actions taken by all those involved. These actions and individual decisions must be supported by adequate training of the staff and operatives involved.

13.7.24 To ensure appropriate level of competence, the training and development needs of all personnel should be established and reviewed annually, including health and safety and appropriate vocational qualifications. Training should then be provided where appropriate before the Winter Service season.

13.7.25 Issues where training is required are described below. This is not an exhaustive list and will largely be based on local circumstances:
 the content and operation of the Winter Service Plan;
 route familiarisation (as appropriate);
 driving in difficult and hazardous road conditions including duty of care to other road users;
 circumstances where special safety considerations apply;
 snow ploughing, in particular around rail level crossings, tramways, partially segregated areas,
 dealing with emergencies;
 dealing with post ice and snow emergencies especially flooding.

13.7.26 In addition to such specific training it will be necessary to ensure that all personnel are provided with information during operational periods on current network characteristics and constraints, including:
 nature and location of highway works, including statutory undertakers;
 temporary and permanent barriers;
 nature and location of any traffic diversions;
 nature and timing of any events likely to affect network use.

13.7.27 Authorities should prepare specific health and safety policies, guidance, and risk assessments with their service provider. These should be issued and discussed with all personnel, including temporary contractors, and should form the basis of further training as necessary.

13.7.28 Training provided to service delivery personnel should also include specific reference to the health and safety needs of users, including:
 avoidance of spraying pedestrians, cyclists and vehicles where practicable with salt or slush when salting or ploughing;
 avoidance of risks to pedestrians and cyclists when using vehicles in segregated or partially segregated areas and in treating footways;
 ploughing and manoeuvring in restricted circumstances;
 other road vehicles that may not be under proper control.

13.7.29 Authorities should consider both qualifications (e.g. City and Guilds) and practical experience training. Some authorities have found it useful for those personnel involved in Winter Service management and decisions to undertake training in familiarisation and interpretation of weather forecast information.

13.7.30 Authorities are encouraged to have a system to plan and record all winter service related training. This may form part of a wider training management system. This system can then be checked prior to winter to ensure any necessary refresher training is undertaken.

13.7.31 There are several groups of individuals that comprise an authority‟s resources to deliver the Winter Service. These individuals require training to fulfil their duties within an authority‟s Winter Service. These are listed below:

Winter Decision Maker and Manager
13.7.32 Currently there is no formal winter decision maker or winter manager qualification, however most authorities follow a similar approach. Road weather forecasting and systems

training (such as for Road Weather Information Systems) are commonly used indicators of a decision maker‟s competence, combined with proven experience. However, the appropriate experience required to deliver the service can only be gained „on the job‟ over a number of years. Good practice suggests that novice decision makers should undergo an internal training programme. This should include briefings on the Winter Service Plan, meteorological training, experience of operational delivery and mentoring by more experienced staff. This should continue until their experience and competence is proven. It is essential that such training should be well documented to ensure that competence can be demonstrated. Weather forecast providers are able to provide training on meteorology and providers of weather sensors often provide training on how the weather affects the road surface. Exercises delivered via independent organisations can provide decision makers with experience of the management of severe conditions.

Drivers and Operators
13.7.33 Those operating spreading equipment are well served with vocational qualifications such as the City & Guild‟s 6159 modules. It is essential that any operative involved in the use or operation of any plant or machinery has received relevant formal training to do so. Where reserve drivers are available as part of an authority‟s contingency plans it is essential that they are trained to an equal standard of competence.

Winter Supervisors
13.7.34 Under City & Guilds 6159, there is a specific module for winter maintenance supervisors which ensures that the first tier of management is aware of their duties and sufficiently competent to fulfil them. It is essential that appropriate staff within an authority‟s organisation undergo this training.

Senior Management and other Key Stakeholders
13.7.35 Authorities may benefit in providing basic training to senior management and certain key stakeholders in delivery of Winter Service. This can be valuable in managing the expectations in delivering the service during both normal and severe winter conditions. A short training programme will provide a basic understanding of the Winter Service, its limitations and pressures. This may be delivered efficiently as an electronic package or briefing note to minimise staff time in the delivery of it to the multitude of stakeholders.

Training Plan and Records
13.7.36 Authorities are encouraged to ensure they have a system of formal training records. The purpose of the system is to record and monitor the training and competence of each individual involved in Winter Service. The system should use the data within it to help identify those people whose training requires refreshing and renewing. Where authorities contract out Winter Service they should require their suppliers to maintain similar records.

13.7.37 The system should comprise a development action plan for each individual and record progress in meeting that plan. This will enable training sessions to be targeted, planned and executed in a cost efficient manner.

13.7.38 Before commencement of the winter season training records should be checked to identify whether out of season training has occurred and individual training records have been updated. Additionally any mentoring schemes or similar experience-based learning should also be consulted to avoid any issues later in the season.

Route and Equipment Familiarisation
13.7.39 Relevant staff and operatives should undertake familiarisation training with winter arrangements, treatment routes and equipment. This is especially important for operational staff that may be new to the authority‟s Winter Service. Tool box talks and dry runs of

treatment routes are useful approaches to deliver this training. Records of this training should be recorded on the training management system as described above.

Exercising

13.7.40 Planning and preparing for a winter season are essential activities, but often the measures implemented are only tested in a live situation. Exercising and testing aims to confirm that the plans and procedures are suitably robust to cope with conditions in a safe and non-consequence environment. It is recommended that authorities and relevant organisations should provide training and conduct periodic exercising to test plans for responding to severe weather events.

13.7.41 Authorities and relevant organisations should provide training and conduct periodic exercising to test plans for responding to severe weather events. **(Recommendation 15)**

13.7.42 The Civil Contingencies Act 2004 requires Category 1 responders to exercise their plans to validate and test them. Although winter planning does not necessarily fall into the plans that must be exercised it is clear from recent winter events that severe snowfall will result in the invoking of various other emergency plans via local and regional resilience fora.

13.7.43 It would be beneficial for authorities to build severe weather conditions into regional or local training exercises or to develop specific Winter Service exercises involving adjacent authorities and relevant partners. Such testing of plans and personnel associated with the Winter Service would ensure authorities are fully prepared. It would also assist with ensuring that resilience of Winter Service is addressed and communication networks developed and improved. Appendix H contains further guidance regarding the design and delivery of winter exercises.

13.7.44 *Case study*. The Highways Agency has been running Snow Desk adverse weather exercises for several years. The exercises are based on resilience guidelines using real networks, realistic scenarios and weather forecasts to ensure that effective and realistic assessments are achieved.

Plant and Vehicles

13.7.45 A range of vehicles, plant and equipment is used to deliver Winter Service. It is important that this equipment is well maintained, calibrated and reliable. This Code does not deal in detail with the equipment used for Winter Service, but refers to certain more strategic issues relating to procurement and sustainability.

13.7.46 In assessing the required plant and vehicles authorities should ensure that sufficient resources are available for the delivery of the Winter Service during severe and prolonged ice and snow. This should be compatible with the resilience standards adopted by the authority.

13.7.47 It is unlikely that, with the level of investment involved, authorities will be able to make frequent changes to the fleet, other than replacement or renewal. It is important however, that opportunities are taken when overall service procurement changes are being contemplated to thoroughly review Winter Service and equipment procurement.

13.7.48 There have been significant advances in the equipment available on the market in recent years. Vehicles are now capable of delivering a range of treatment types and can have sophisticated technology. The procurement of such technology potentially allows a more targeted and effective approach to treatment of the road network and an improved audit trail of where treatments have been undertaken.

13.7.49 It is often extremely difficult and inefficient to remove significant depths of snow using only salt and therefore consideration should be given to the use of snow ploughs mounted on spreaders or other suitable vehicles. Snow ploughs are durable, require little maintenance and should therefore prove very cost effective. However, in urban areas there may be considerable difficulties in utilising snow ploughs and in this situation any consideration should be on a risk based approach.

13.7.50 It is also important to consider equipment requirements for dealing with footways and cycle routes. Specialist equipment, such as footway ploughs and footway salt spreaders may be necessary for this purpose.

13.7.51 The location of depots should be kept under review and specifically addressed when consideration is being given to procurement arrangements. It would be unlikely if all present depots from which authorities undertake Winter Services are ideally located, and significant financial and operational savings can often be achieved from re-location.

13.7.52 The environmental effects of highway maintenance depots and operations are dealt with in Section 15 of this Code, and these can be particularly significant in the case of the Winter Service, where operations will inevitably involve unusual hours of working. Every effort should be made to minimise the environmental intrusion of depots and so far as is practicable the effect of Winter Service operations.

13.7.53 A significant contribution to minimising environmental effects can be made by providing covered storage for all vehicles, equipment and materials, which can also reduce waste and maintenance problems.

13.7.54 Purchase and ownership of vehicles and equipment will also be a key issue for consideration in relation to the procurement of services. Private sector partners may be able to assist with financing arrangements and authorities will need to balance the financial advantages of this against the contractual and operational risks involved.

13.7.55 The need to ensure vehicles are correctly calibrated, well maintained and repaired quickly is essential to the delivery of the service. Whatever arrangements are used the response time, speed of repair, availability of spare parts, quality of repair and audit trail should be carefully established and documented.

Precautionary treatments

13.7.56 These are the application of de-icers to road surfaces before the onset of freezing conditions (i.e. frost, snow or freezing rain). The purpose of precautionary treatments is to prevent the formation of ice, or to weaken or prevent the bond of freezing rain or snow to road surfaces.

13.7.57 It is usually impractical to spread sufficient salt to melt freezing rain or more than a few millimetres of snow. Therefore, in advance of forecast snow or freezing rain, salt is spread to provide a debonding layer so that:

- snow is more readily removed by ploughing
- compacted snow and ice are more easily dispersed by traffic

13.7.58 It is very difficult to remove a layer of compacted snow or ice that is bonded to the road surface, so precautionary treatments are essential before heavy snowfall.

Salt and De-icing Materials

13.7.59 Rock salt is the prime material for dealing with ice and snow on roads but can have environmental consequences. It can adversely affect vegetation, pollute watercourses and leave a residue on footways. It can also damage the road structure, bridges and structures,

utility apparatus and vehicles. However, used responsibly it can have minimal environmental impact. In the interests of sustainability therefore authorities should ensure that only the minimum of salt is used to deal with the prevailing conditions. Suggested rates of spread are given in Appendix H.

13.7.60 Appendix H lists a number of alternative materials that authorities could consider using in place of rock salt in particular circumstances. The costs of some of these are extremely high and particular materials also have some environmental consequences. They may prove, however, to be cost effective in specific locations, such as the treatment of footways, where the need for additional sweeping can be avoided, and bridges, where the damage caused by the use of salt can be avoided.

13.7.61 As rock salt requires the passage of traffic to improve effectiveness, it may be necessary to use brine in some cases for example some cycle routes.

Salt management

13.7.62 Salt is a finite resource and UK suppliers are constrained by mining operations amongst other factors as to how much may be produced and supplied. Supply can therefore be outstripped by demand during severe weather. It is therefore important to make optimum use of salt for de-icing and make every effort to store and use it efficiently, regardless of the weather conditions, in order to minimise consumption. In addition there can be significant financial benefits to be gained adopting such an approach.

13.7.63 Salt is consumed in significant quantities during the winter season, so even small percentage savings in salt use through accurate calibration of spreaders, considered decision making and appropriate treatments is important. These measures will help to minimise the overall consumption of salt on a national basis. Appendix H contains further information regarding spreader calibration. Ultimately, authorities should consider ways of reducing overall salt consumption while maintaining agreed levels of service on their network. Considerable savings can be made in the amount of salt used to treat carriageways if the salt is maintained in good condition and spreaders are correctly calibrated.

13.7.64 Many authorities award salt supply contracts to a single supplier on a call-off basis. Contracts are often awarded on a balance of quality and price, with price usually being the driving consideration. This approach has resulted in a price driven market where salt supply is often treated as a commodity purchase. Authorities carry the risk of being able to obtain the salt they require when they require it. Suppliers carry the risks involved in producing and stock piling salt before sale. Commodity purchase arrangements do not necessarily embrace the service relationships between authorities and their salt suppliers which should lead to improved reliability, and knowledge and anticipation through good communications, and which are facilitated by contemporary procurement arrangements.

13.7.65 Authorities and salt suppliers should treat the supply of salt as a service rather than a simple commodity purchase. **(Recommendation 16)**

13.7.66 Authorities should place orders for summer restocking, and make arrangements for in-season restocking. It may be beneficial to consider the option of changing de-icing material to minimise consumption and improve resilience.

13.7.67 It has become common to restock at intervals during the winter season using salt management systems based upon predicted use of salt and delivery times. The salt shortage in winter 2008/09 demonstrated that it is difficult for salt supply arrangements to accommodate significantly increased short term demand. Authorities should therefore ensure sufficient resilience in their salt stocks.

13.7.68 Authorities should develop close working relationships with salt suppliers and ensure that initial salt quantities and reorder triggers are set to achieve their local resilience standard.

13.7.69 It may not be easy for some authorities to achieve an appropriate level of resilience through storing salt at their own depots. Salt suppliers may be able to hold dedicated stock at locations around the UK and authorities should consider whether such an approach is possible.

13.7.70 Communications and relationships with salt suppliers may be improved by the development of supplier user groups and authorities should consider participation is such groups.

13.7.71 The salt shortages in winter 2008/09, 2009/10 and 2010/11 prompted various local, regional and national salt stockpiling arrangements. This has significantly increased salt stockholding nationally and therefore added resilience. However it is important that Authorities do not routinely rely upon these stockpiles as they are intended only for use during sustained severe winter weather. The Department for Transport Salt Portal plays a key role in managing reserve stocks as it allows early visibility of potential salt supply issues and also enables continual assessment of current stockholding across England.

Salt storage

13.7.72 There are two principle reasons to ensure that salt is stored carefully and in accordance with the good practice described below, namely ensure a consistent product for spreading and to reduce losses due to leaching.

13.7.73 Moisture content can have a significant impact on spreader calibration with over or under spreading possible. Authorities may therefore achieve more consistent spreading of salt through maintaining a constant moisture content in the salt throughout the entire season. Appendix H contains further details regarding the moisture content of salt.

13.7.74 As part of pre-season preparation, authorities should review how their salt is stored in order to identify how greater efficiency may be attained in its use. This may include developing the business case for salt barns or covering open storage facilities. Moisture content of salt is a critical factor in determining spreading rates and distribution.

13.7.75 The correct storage of salt is essential to minimise environment damage and storage in salt barns helps to prevent leaching, eases handling, helps in maintaining low salt moisture content, and is strongly recommended where additives are used. Detailed advice is available on alternative types and construction methods available. Where open stockpiles are used these should be covered with sheeting, or spraying with bituminous emulsion which provide an effective alternative.

13.7.76 Both permanent and temporary salt storage areas should be sited and managed in accordance with requirements of the Local Planning Authority and the Environment Agency. In particular they should not be sited where they could cause damage to landscape or nature conservation or have the potential to pollute watercourses or groundwater. Authorities should be aware of the deterioration in the quality of salt stored for long periods and the need for effective stock rotation. Appendix H contains further details regarding salt storage options.

13.7.77 Where grit is used for treatment, for example in the more extreme conditions applying in Scotland, storage requirements may be less stringent and local advice should be sought.

13.7.78 As a means of enhancing local salt storage capacity, authorities and salt suppliers should jointly consider supplier owned salt stocks held on a short or long term basis in a number of widely distributed locations around the country. A joint approach may include agreements such as purchase of some or all stock by the end of a season or provision of land. **(Recommendation 17)**

Reserve Stockpiles

13.7.79 In addition to operational stock, local authorities and strategic road operators have created reserve stockpiles. These stockpiles can be categorised into three different types:

- Local reserves – held by a single authority for its own use during times of limited operational salt stocks;
- Regional reserves – held on a regional / consortium basis whereby reserve stocks have been made available for use by more than one authority;
- National reserves – stockpiles held across the UK for use by any authority during times of shortage. In England this is currently being delivered via the Highways Agency and is likely to have certain conditions of use. Transport Scotland and Transport for London have their own arrangements.

13.7.80 These stockpiles are not used during normal Winter Service but will be available if salt suppliers are unable to maintain operational stocks at an acceptable level. Release of salt should be subject to agreed protocols with the relevant operators. Authorities should put these arrangements in place before the start of the winter season.

13.7.81 Identifying the size, location and storage type of these stockpiles is important. Salt is a bulk commodity, but a reserve stockpile is still a significant investment. It should be stored in a location to allow convenient access to the area it serves and of course remain accessible during times of severe weather. The site should be secure to avoid trespass and theft of salt. Provision should be made in planning for loading facilities although there is unlikely to be a need for permanent on site plant.

13.7.82 Reserve stocks are unlikely to be barn stored. However they should be well covered to prevent leaching and deterioration of the salt. To avoid any gaps in planning any jointly held reserve stocks should have a salt stock management plan specific to that stockholding.

Salt Procurement

13.7.83 Authorities should seek a broad approach to salt supply, for example establishing framework contracts with more than one supplier. **(Recommendation 18)**

13.7.84 Ideally, the suppliers should be geographically separated to reduce the risk of them being impacted by the same high demand situation.

13.7.85 *Case Study*. Devon County Council has adopted a framework contract which specifies the supply of different types of salt, including rock and marine salt from different UK and overseas suppliers. The Council can specify the quantity of salt and has options for different salt for different purposes e.g. pre-wetting or normal salting.

13.7.86 Authorities should consider whether efficiency benefits can be obtained from collaborative salt procurement and should also consider ways to improve the balance of risk between salt suppliers and themselves, e.g. longer contracts, performance contracts with minimum guaranteed purchase and supply, and contracts that include supply of salt and investment in facilities. **(Recommendation 19)**

13.7.87 *Case study*. The Illinois Department of Transport performance contract adopts purchase arrangements based on a contracted range of supply between minimum and

maximum levels. Illinois guarantees to purchase 80% of its estimated salt need and the supplier guarantees to supply up to 120% if required. This provides the State with security and the supplier with guaranteed business.

Post Snow Inspection and Maintenance

13.7.88 Immediately following the completion of snow clearance operations priority should be given to the clearance of gullies and offlets to ensure that melt water from snow on verges and island or central reservations can quickly drain away. However, it may be especially difficult to prevent melt water which is running across the carriageway from freezing and several applications of salt may be necessary.

13.7.89 It will also be necessary to inspect the network to ensure that any damage is dealt with either as a Category 1 defect or as programmed maintenance as appropriate. The inspection should be treated as a special safety inspection and deal with the items usually included. Special attention should be given to the routes treated and the following items:

- removal of accumulations of grit from running surfaces and drainage channels;
- inspection and clearance of all bridges, culverts and drainage systems liable to flooding;
- inspection for frost effects and any damage caused by Winter Service equipment;
- check and replenish salt stocks in depots and grit bins;
- inspect, clean, lubricate, check and repair all vehicles and plant.

13.7.90 In addition it will be important to debrief all personnel involved to ensure that their experience and observations are recorded. These should be used to inform the Annual Service Review and contribute to the process of continuous improvement. It will also be useful in a less formal way to invite observations from parish and town council snow wardens and others that may have also contributed to the operations.

13.8 REVIEW

13.8.1 All aspects of the Winter Service Plan, including service delivery arrangements, should be reviewed annually in consultation with key stakeholders to take account of changing circumstances. **(Recommendation 20)**

13.8.2 All vehicles, plant, fuel provision, equipment and maintenance arrangements should be checked annually and in accordance with manufacturers‟ requirements to ensure that any necessary action can be taken to ensure full operational service status prior to the Winter Service season. This should include checking the calibration of all de-icing equipment and spreaders.

13.8.3 Authorities should review the administrative and management arrangements for Winter Service annually. This should include the role of the private sector in delivering highway services, and the use of support services such as refuse collection, street cleansing and grounds maintenance services.

13.8.4 As part of the Annual Review authorities should consult with bus operators regarding changes to routes. In doing so and where practicable bus operators should be encouraged not to change routes throughout the winter season where there would be an effect on treatment routes.

13.8.5 The Annual Review should include an analysis on whether service delivery meets the Winter Service policy and plan. It should also include a review of the current thinking with regards to the impact of climate change. Service efficiency improvements such as route optimisation should also be considered.

13.8.6 Following any significant winter weather event, a formal review involving representatives from all levels of the management and delivery of Winter Service should be

carried out. The review should specifically identify the successful elements of the service as well as potential improvements and actions to be taken. Where applicable, other stakeholders should be involved. The review process should be documented to ensure all learning is captured, considered and actioned. This should feed into the Annual Review.

RECOMMENDATIONS FOR SECTION 13

R13.1 Authorities should formally approve and adopt policies and priorities for Winter Service, which are coherent with wider objectives for transport, integration, accessibility and network management, including strategies for public transport, walking and cycling. They should also take into account the wider strategic objectives of the authority.

R13.2 Authorities should consider, consult on and formally adopt local service standards for resilience of their winter service in terms of number of days continuous severe conditions salting on a defined Minimum Winter Network for the Overall Winter Period and for the Core Winter Period.

R13.2a A resilience benchmark of 12 days/48 runs should be adopted for full pre-season salt stockholding by 1 November for English local highway authorities.

R13.3 Authorities should review their approach to climate change and in particular their resilience to prolonged cold weather.

R13.4 Authorities should consider whether collaborative arrangements such as shared services, lead authority arrangements, collaborative service procurement, and sharing depots and salt stock, would provide an effective and value for money approach to increasing winter service resilience.

R13.5 Authorities should determine critical areas and infrastructure in conjunction with key public services and other stakeholders and seek to ensure that appropriate winter treatment has been considered by the appropriate party.

R13.6 Authorities should ensure effective communication of information for the public before and during both normal and severe winter conditions.

R13.7 Authorities should ensure that there is appropriate consultation and communication with other highway authorities, key public services and other stakeholders to ensure improved service for the public.

R13.8 Authorities should formally approve, adopt, and publish, in consultation with users and key stakeholders, a Winter Service Plan based on the principles of this Code.

R13.9 Authorities should define treatment route plans for carriageways, cycle routes and footways for pre-treatment and snow conditions, based upon the general maintenance hierarchy, but adapted to take into account the factors identified by this Code.

R13.10 Authorities should prepare contingency Winter Service Plans for severe weather conditions which include possibilities such as salting a Minimum Winter Network. Authorities should seek agreement on plans in advance with other highway authorities and key public services such as hospitals and public transport providers. There should be a co-ordinated approach to implementing Minimum Winter Networks across adjacent highway authorities.

R13.11 Authorities should explore the potential for mutual aid in salt supply and other aspects of winter service and should make contingency arrangements in advance.

R13.12 Authorities should take full advantage of decision support systems and services to enable timely, efficient and accurate decision making.

R13.13 Authorities should continually monitor performance during service delivery and respond effectively to changing conditions or network incidents.

R13.14 To ensure appropriate level of competence, training and development needs of all personnel should be established and reviewed annually, including health and safety and appropriate vocational qualifications. Training should then be provided where appropriate before the Winter Service season.

R13.15 Authorities and relevant organisations should provide training and conduct periodic exercising to test plans for responding to severe weather events.

R13.16 Authorities and salt suppliers should treat the supply of salt as a service rather than a simple commodity purchase.

R13.17 As a means of enhancing local salt storage capacity, authorities and salt suppliers should jointly consider supplier owned salt stocks held on a short or long term basis in a number of widely distributed locations around the country. A joint approach may include agreements such as purchase of some or all stock by the end of a season or provision of land.

R13.18 Authorities should seek a broad approach to salt supply, for example establishing framework contracts with more than one supplier.

R13.19 Authorities should consider whether efficiency benefits can be obtained from collaborative salt procurement and should also consider ways to improve the balance of risk between salt suppliers and themselves, e.g. longer contracts, performance contracts with minimum guaranteed purchase and supply, and contracts that include supply of salt and investment in facilities.

R13.20 All aspects of the Winter Service Plan, including service delivery arrangements, should be reviewed annually in consultation with key stakeholders to take account of changing circumstances.