



Keep London Moving
Through Severe Winter Weather

> Practical Steps for London Highway Authorities

October 2010

Contents

Acknowledgements	i
Executive Summary	1
Introduction	2
Independent Winter Resilience Review	4
Working Together and with Other Stakeholders	5
Weather Forecasting and Information Services	7
Road Resilience Network	9
Footway Treatment and Equipment	11
Pan London Strategic Salt Stock	13
Co-ordinated response to future salt shortages	16
Next steps	18
References	19
Appendix A	20
Appendix B	22

Acknowledgements

The London Winter Service Review Steering Group would like to acknowledge the help and support it has received in preparing this document from those listed below.

City of London Corporation

Transport for London

London Fire Brigade

LONDON WINTER SERVICE REVIEW STEERING GROUP

London Technical Advisors Group

London Councils

London Fire Brigade

Transport for London

SUPPORT CONSULTANTS

Atkins Highways and Transportation

Executive Summary

London has now experienced two consecutive severe winter weather events in 2008/09 and 2009/10. Key stakeholders in London, including highway authorities responsible for planning and responding to severe winter weather, have continued to learn from these events in order to plan further improvement to the service they provide for Londoners.

London's highway authorities include the London Boroughs, the City of London and Transport for London (TfL). They continue to work together to improve winter service, particularly to plan for severe winter weather including a shortage of salt. There are many stakeholders involved in keeping London moving and it is essential that all are involved in planning, sharing information and working together. London's approach to the management of severe winter weather events is described in '*Keep London Moving Through Severe Winter Weather*' published by the Gritting Panel Review Team. Workshops with key stakeholders have been held and will continue to be held to ensure good communication and understanding.

London's work to integrate severe winter weather planning into wider resilience planning has proved successful as demonstrated by the implementation of the pan-London Resilience Network and management of the distribution of salt during the 2009/10 severe winter weather. This integrated approach involving key stakeholders is one of the recommendations in the interim report of the *Independent Winter Resilience Review July 2010*, commissioned by the Secretary of State for Transport. London is noted in the report as an example of where this already occurs.

There remain opportunities for continuous improvement in how severe weather events are managed by London and therefore lessons that may be learnt from the 2009/10 winter. Key stakeholders have worked together through the London Winter Service Review Steering Group to identify further improvements around resilience planning the effective use of salt on London's highway network. This has included:

- Improved communications through workshops and winter exercising;
- Consideration of how to improve weather forecasting and information services, including access to Road Weather Information Systems;
- Further development of a core network of roads throughout London, called the Resilience Network, which will continue to be salted during prolonged severe winter weather or a salt shortage;
- Agree a consistent definition for important footways, called Footway Resilience Areas, which individual authorities will treat during prolonged severe winter weather or a salt shortage.
- Consider how footways can be treated effectively;
- Introduce a pan-London strategic reserve salt stock ready for use in future prolonged severe winters; and in the event of a salt shortage;
- Formalise the way in which London operates the London Salt Cell (LSC), should the occasion arise.

As a result of the work carried out by the London Winter Review Steering Group, London, through Transport for London (TfL), has now in place a strategic stockpile of salt. This stockpile is sufficient to maintain the required resilience standard for the London Resilience Network. The protocol for the release of salt from the strategic stockpile has been agreed to ensure maximum usage from the salt stock, whilst providing the necessary resilience across London.

The Department for Transport is developing guidance to members of the public on how to clear snow and ice from footways. When the guidance is published, London highway authorities will promote this guidance.

This document sets out the approach to the management of the protocols for implementing the London Resilience Network. This includes the role of London Severe Weather Gold Cell in implementing the London Resilience Network and TfL in management of the strategic stockpile. The circumstance under which any further London Salt Cell is reconvened is also described.

'*Practical Steps for London Highway Authorities*' is produced as a supplement to '*Keep London Moving Through Severe Winter Weather*' published in December 2009.

Introduction

Management of London's Network in Severe Winter Weather

- 1 London is unique in the UK in the size and density of its road network. Travel on the network is largely independent of London administrative areas and normal business, social, bus and emergency service journeys are likely to cross boundaries on a regular basis. Hence, there are a number of stakeholders involved in managing travel and keeping London moving.
- 2 London has now experienced two severe winters in succession. Stakeholders responsible for planning and responding to severe winter weather, including London's highway authorities, have continued to learn from the events in order to plan further improvement to the service they provide for Londoners.
- 3 The severe winter weather of 2008/09 led to a national salt shortage and major disruption to travel, throughout the UK. The winter of 2009/10 was even more severe than that of 2008/09, with temperatures at their lowest for 30 years, and there was again a national salt shortage. Lessons learnt from the 2008/09 winter were applied in 2009/10, which successfully kept London moving through the severe winter weather, but not without difficulty. London's information-sharing arrangements provided a more formalised process for sharing concerns and information between stakeholders. As such, communication channels between London's 34 highway authorities were well established.
- 4 Highways are one of London's largest public assets and enable the social and economic wellbeing of its community. Safe and reliable highways are fundamental, being the starting and finishing point of almost all journeys in London. They provide access to the underground, rail and bus services and enable London's emergency services to operate effectively.

Keep London Moving

- 5 The document '*Keep London Moving Through Severe Winter Weather*' was published in December 2009 following the severe 2008/09 winter. This emphasised the importance of London's highways to the life and economy of London and set out the key stakeholders involved in keeping London moving in severe winter weather. Pan-London contingency arrangements for severe winter weather were summarised and the importance of communications with the public and between stakeholders emphasised.
- 6 '*Keep London Moving Through Severe Winter Weather*' was published by the Gritting Panel Review Team, a partnership between the London Technical Advisors Group (LoTAG), London Councils, London Fire Brigade and Transport for London (TfL).

Winter 2009/10

- 7 During the winter of 2009/10, many of the lessons learnt in the previous year were addressed. There was however still a need to establish a UK-wide Salt Cell to distribute scarce supplies of salt across the UK to those highway authorities in most need. This National Salt Cell was managed by the DfT, but included representatives from the Devolved Administrations. A separate London Salt Cell was set up for London, a representative of which was also a member of the national Salt Cell.
- 8 To respond to London needs, the London Severe Weather Gold Cell (LSWGC) was established, comprised of representatives from London Local Authorities, London Councils, London Resilience Team, London Fire Brigade Emergency Planning and Transport for London. Uncertainties over the delivery of salt in 2009/10 resulted in a decision by the London Severe Weather Gold Cell (LSWGC) to set up a multi-agency LSC to act to enable best use of salt supplies during the current severe weather situation. Allocations made by the LSC were coordinated through the

- London Local Authority Coordination Centre (LLACC), whilst TfL managed the distribution of stock. TfL and several London highway authorities also provided mutual aid during this time.
- 9 This second successive salt shortage amongst other issues led to the government commissioning an Independent Review into the resilience of transport systems in winter, referred to as the Quarmby Review.
 - 10 As part of their contribution to reducing salt consumption during the 2009/10 national salt shortage, London's highway authorities reduced salting to a core network of roads at certain times. The experience of 2008/09 meant that the core network, referred to as the Resilience Network, had been pre-prepared through close liaison between highway authorities and key stakeholders to ensure that important routes and accesses were treated. *'Keep London Moving'* describes the high level approach adopted by London to implement their Resilience Network.
 - 11 This planned and co-ordinated response to the severe winter resulted in significant praise from national and local media.

London Winter Service Review Steering Group

- 12 As a consequence of the 2009/10 severe winter, a Winter Service Review Steering Group, chaired by LoTAG and TfL, was set up under the leadership of the Local Authorities Panel (LAP). The aim of the group was to determine how to further improve London's resilience and response to severe winter weather. This Group superseded the London Gritting Panel Review Team.
- 13 This Group has led work on communications with key stakeholders, a permanent pan-London strategic salt stock, clarity in the definition of road and footway resilience networks, pan-London weather services and guidance on footway gritting. As part of this work the group considered the continued implementation of the recommendations in the national Code of Practice, *Well-maintained Highways*. The Group membership and terms of reference are included in Appendix A.

Purpose of this document

- 14 *'Practical Steps for London Highway Authorities'* has been produced by the London Winter Service Review Steering Group, as a supplement to *'Keep London Moving Through Severe Winter Weather'*.
- 15 This document describes the work that the group has carried out, the progress made in implementing the improvements in winter service and the next steps required to ensure London continues to be prepared for severe winter weather.

Independent Winter Resilience Review

- 16 *The Resilience of England's Transport Systems in Winter* was produced by the Quarmby review <http://transportwinterresilience.independent.gov.uk/>. London submitted evidence to the review through a joint submission from TfL and the London Local Authorities Resilience Panel. The submission explained how London had acted upon the lessons of the 2008/09 winter and its experiences of the 2009/10 winter.
- 17 The submission described how London-wide arrangements for responding to severe weather had developed. In particular, it explained how the London Local Authorities Panel and the highway authorities were working together, describing how key winter and emergency planning staff had linked with professional partners in the emergency and transport services before and during the severe weather. The submission also explained how London had managed with restricted supplies of salt.



In July the Quarmby review produced an interim report '*Resilience of England's Transport System in Winter*'. The report recommends that highway authorities treat their winter service planning as an integral part of wider resilience planning and noted London as an example of where this already occurs. Further recommendations are made with regards to:

- The need for a strategic reserve of salt;
- Monitoring of salt stock;
- Working with stakeholders in preparing plans for winter service; and
- Mutual aid agreements.

Working Together and with Other Stakeholders

London's Highway Network

- 18 London comprises a diverse network of highways that include carriageways, bus routes, footways, cycle routes and pedestrian precincts. Maintaining the public highway is the responsibility of London's highway authorities; these include the 32 London Boroughs, the City of London Corporation and TfL.
- 19 In addition to this, there are many private roads, car parks and private accesses onto the public highway. Some of these are critical in that they provide access to hospitals, emergency services, doctors' surgeries and homes for the elderly. The efficient operation of many of London's essential public services may be dependent on the removal of ice and/or snow from key areas of private land, such as access to bus depots and ambulance stations, which is fundamentally the responsibility of land owners. However, adjacent London highway authorities will assist in ensuring a system is in place for their treatment.

London's Highway Authorities

- 20 London's highway authorities including the Boroughs, the City of London and TfL work together in preparing for winter through LoTAG, which promotes collective working and good practice. As such LoTAG co-ordinates and collaborates in the delivery of Winter Service for London's highway authorities. Each authority undertakes annual reviews of its winter service plan and conducts post-season debriefs. This follows national good practice as described in *Well-maintained Highways*.

Key Stakeholders

- 21 London's local authorities have responsibility under the Civil Contingencies Act 2004 to assess the risk of emergencies occurring and where the risk is high to maintain plans for mitigating such emergencies. As such, all of London's local authorities participate in the London Local Authority Gold (LLAG) arrangements, under which the London Local Authority Co-ordination Centre (LLACC) operates during regional emergencies. The LLACC is responsible for co-ordinating the activity of all 33 London local authorities when LLAG arrangements are activated, and it facilitated the sharing of mutual aid between authorities during the severe weather of 2009/10.
- 22 London's key stakeholders include:
 - TfL;
 - London Boroughs;
 - The City of London Corporation;
 - London Ambulance Service;
 - London Fire Brigade;
 - NHS;
 - London Bus Companies;
 - The Met and City of London Police; and
 - LoTAG.
- 23 During the severe winter of 2009/10, London's key stakeholders worked together in responding to requests for salt, examples of which included the re-stocking of all 69 ambulance service stations. This request, as well as other requests for mutual aid, was co-ordinated through LLACC and the LSC.

Planning for Severe Winter Weather

- 24 All key stakeholders have a responsibility to work together to co-ordinate activities in planning for winter. Improving communications and learning lessons from recent experience are seen as key activities.
- 25 Communication between key stakeholders is paramount in the delivery of winter service during severe winter weather. In order to facilitate communication, exercises and workshops are seen as key not only to improving communication but also to continually improve planning through sharing lessons learnt.
- 26 Learning lessons and sharing good practice is an excellent way to drive continuous improvement and seek efficiencies. Working together, key stakeholders can also help to identify potential areas for new innovations that could be trialled. Post-season Lessons Learnt Workshops have been arranged involving the Boroughs and TfL to share all lessons learnt, discuss problems and identify areas for improvement.
- 27 In December 2009 an exercise was held with all Boroughs and key stakeholders in order to prepare for the 2009/10 winter. This facilitated the planning of the pan-London Resilience Network that was subsequently and successfully implemented during the 2009/10 severe weather. As a follow-up, a workshop was also held in May 2010 aiming to build on lessons learnt from the severe winter of 2009/2010. This workshop was attended by the London highway authorities and other key stakeholders and provided an opportunity to share good practice and lessons learnt in order to further improve operational resilience. Further workshops will be planned in the coming year (eg. 22 September 2010).

<http://www.tfl.gov.uk/winterservice>

Self help by the Public

- 28 The public may provide help themselves by clearing footways in times of severe weather and a good practice note is being developed by the Department for Transport (DfT) providing guidance to members of the public on how to clear snow and ice from footways and in order to alleviate concerns of being sued. Provided that they are reasonable and careful and use ordinary common sense, it is very unlikely that a member of the public would face any legal liability. Users of these areas also have responsibilities to themselves. London's highway authorities will promote this guidance on self help.

http://www.direct.gov.uk/en/NI1/Newsroom/DG_191868

Weather Forecasting and Information Services

Weather Forecasting

- 29 Effective and efficient weather forecasting is key to identifying the need to carry out precautionary salting of London's highways. It is also key to identifying severe and prolonged severe winter weather in order to assist with planning. Forecasts are normally provided as long, medium and short range. Long range weather forecasting is notoriously difficult and unreliable. In the medium term, ie 2 to 5 days, weather forecasts are more reliable but can also vary significantly. Short term weather forecasting tends to be far more reliable.
- 30 Accurate long range forecasting would be a useful tool to help highway authorities predict salt usage and for salt suppliers to arrange appropriate supplies. However, given that in reality such forecasts are not sufficiently reliable, relating salt stock prediction to long range weather forecasting is too high risk. On the other hand, reliance on medium term weather forecasting, although giving good indication of needs for salting, does not provide a sufficiently long time for highway authorities to order and take deliveries of any significantly larger quantities of salt than normal, or for suppliers to significantly increase supplies. Weather forecasting cannot therefore be reliably used as the main determinant for salt stocks, either at the start of the season or when re-ordering, although it may be a relevant consideration.

Decision Making

- 31 Winter decision making is undertaken independently by each London highway authority. Each authority makes a decision for its own network based on the information available from its weather information services, knowledge of local conditions and the decision maker's own training and experience.



- 32 Some of London's highway authorities maintain a network of weather stations linked to a central system. This is known as a Road Weather Information System (RWIS) and provides the weather information that the highway authority's decision makers use to direct the winter service operation such as precautionary salting and clearance of snow in severe winter weather.
- 33 Other London highway authorities use free weather forecasting services which provide less detailed information for decision makers. Where such services are used, decision makers tend to err on the side of caution, with the consequence of inefficient use of salt.

- 34 This localised approach to decision making is adopted for each authority and provides some advantages such as:
- Local decision makers have specific knowledge of their area that enables efficient prioritisation of problem areas in severe winter weather; and
 - Highway authorities can manage the service to meet local expectations.

Approach to Weather Forecasting

- 35 LoTAG carried out a review of the weather information services in order to determine how weather forecasting across London highway authorities is currently conducted and what improvements may be made for the future. This work will help improve London's approach to decision making and the more efficient use of salt for the treatment of London's network.
- 36 This review reported that *'the weather services in London appear to be generally fit for purpose, with some authorities having modern weather stations and systems providing quality data for decision making and monitoring'*. It also reported that each of London's highway authorities procures weather information services which support winter service to a differing extent. As such, the review concluded that all London highway authorities should have access to RWIS to follow good practice and improve the quality of their weather information.

<http://www.tfl.gov.uk/winterservice>

- 37 There are a limited number of companies that provide weather forecasting and the products available are very similar. Therefore, many of the contracts across London are with the same companies, providing opportunity for a single regional contract. The review also includes a number of other recommendations, ranging from reviewing the gaps in information from weather stations, communications and verifying the data behind climatic zoning within London. LoTAG is continuing to work towards an approach to take all of these issues forward.

Road Resilience Network

Normal Winter Conditions

- 38 Each London highway authority has its own Winter Service Policy. Each highway authority determines its own priorities for treatment routes during normal winter weather (normal treatment network), based on their maintenance hierarchy, as described in *Well-maintained Highways*, but adapted to take into account factors identified in its Policy. The treatment of this network should follow good practice, as described in *Well-maintained Highways*.

A Pan London Approach

- 39 London's highway authorities have agreed a joint approach to salting a reduced network of roads and footways, should that become necessary during prolonged severe winter weather or a salt shortage, to ensure that travel on essential routes across London is possible, as far as is practicable.

London Road Resilience Network

- 40 The London Road Resilience Network describes the minimum roads within the Greater London Authority boundary that are required to be continuously kept open in severe winter weather to allow essential services to operate reliably and safely and to keep London moving. The network includes the roads to be treated, even in exceptional weather, when salt storage supplies are scarce, including those for which either TfL or the Boroughs are responsible, together with those in private ownership. It ensures continuity across Borough boundaries, access to the strategic road network, both within and outside London and allows London buses to operate a minimum service. The London road resilience network includes all A classified roads, roads required to access essential services and bus routes with frequent bus services¹.
- 41 Essential services include:
- Hospitals with accident and emergency departments;
 - Police, fire and ambulance stations;
 - Bus and railway stations;
 - Bus garages and depots;
 - Thames bridges and access to Woolwich Ferry;
 - Salt storage depots;
 - Known topological problems, including gradients on B class roads; and
 - Other critical roads, as agreed by the Borough and Transport for London to be of a sensitive nature.
- 42 Highway authorities have prepared a road resilience network which is typically a sub-set of normal salting routes, which is about 50% of the normal treatment network. The resulting London road resilience network has been peer reviewed between highway authorities and subject to an independent review to ensure consistency.

<http://www.tfl.gov.uk/winterservice>

¹ Average 5 or more buses per hour, daytime frequency

Triggering the Regional Implementation of Road Resilience Networks

- 43 In the event of continued severe winter weather, individual London highway authorities may consider activating their resilience network. This decision should be made if resources are thought to be insufficient to continue treatment of normal salting routes. The decision should be reported under the regular grit audit reporting arrangements. On the identification of potential regional shortages within regional grit reports, the London Severe Weather Gold Cell (LSWGC) may decide to activate the full regional road resilience network arrangements.



- 44 In the first instance, highway authorities should use their own stockpiles of salt which should be maintained to meet good practice, as described in *Well-maintained Highways*. Where the stockpiles are insufficient to meet the levels described in *Well-maintained Highways* to treat their relevant portion of the Resilience Network, highway authorities should inform the LSWGC. LSWGC will then facilitate supplies from the strategic stockpile and mutual aid as appropriate. Access to the stockpile is authorised under the Strategic Salt Protocol and its existence does not obviate the need for authorities to comply with good practice, hold adequate operational stock at the local level and participate in mutual aid arrangements.
- 45 London local authorities are currently collectively progressing a regional mutual aid agreement, which will enhance existing arrangements and will further reinforce London's commitment to support itself in crisis.

Footway Treatment and Equipment

Developing a pan London Approach to Treating Footways

- 46 In order to better prepare for severe winter weather, all London highway authorities have agreed to define the treatment route plans for their footways for both pre-treatment and snow conditions. These plans will be based upon a general maintenance hierarchy adapted to take into account factors identified by local policy.
- 47 The general maintenance hierarchy is designed primarily for precautionary treatment, under 'normal working conditions'. The following hierarchy is common across the London highway authorities with regard to the de-icing of footways. The hierarchy comprises four levels:
- Very busy locations around public transport interchanges and busy pedestrian areas;
 - Residential and shopping frontages;
 - Moderately used footways; and
 - Seldom used footways.
- 48 During periods of very severe winter weather, the footway resilience network will be triggered. The triggering of this network has been described previously. This hierarchy focuses on a reduced selection of footways to be treated in the face of dwindling salt supplies.

Effective Treatment of Footways

- 49 In addition to defining the network to be treated, LoTAG recognise the need to better prepare their approach to treating footway networks in a more efficient and effective manner, particularly during snow conditions. Some London highway authorities rely on overspill from carriageway treatments to also treat the footways. This is augmented by spreading of salt manually on their treatment networks. This approach is considered to be inefficient when planning for severe winter weather.
- 50 At present national guidance is limited on the treatment of footways in urban areas. LoTAG has therefore undertaken work to support an overall approach to treating footways. This report has provided information on the types of equipment available for the effective treatment of footways how alternative treatments such as brine may be used. It considers manual and towed equipment as well as mini spreaders. Capital costs of equipment vary significantly. Each authority therefore decides on the merits of investing in such equipment based on their own needs and develops an appropriate business case. In doing so, consideration should be given to the length of footway to be treated and pedestrian levels.

London Footway Resilience Areas

- 51 London resilience footways describe the minimum footway areas within the Greater London Authority boundary to be treated when the resilience state has been triggered, so that core essential services can operate. The footway resilience areas are designated by the highway authority.
- 52 The resilience areas should include locations which have either exceptionally high usage or are primary pedestrian routes, providing access to key services, including:
- Hospitals;
 - Medical centres;
 - Key employment sites;
 - Primary and Secondary schools; and
 - Town centres.

- 53 The footway resilience areas should include 20 metres either side of the main entrance to individual premises. They may not be linked but should provide access to the closest bus stop and the road resilience network, where this is practical. The footway areas should provide continuity across borough boundaries.
- 54 In addition, the footway resilience areas should include:
- Footways within key public transport interchanges and links between rail/underground/DLR stations and the closest bus stop on the road resilience network; and
 - Steep hills or other locations known to be unsafe for pedestrians in severe winter weather.

Triggering the Footway Resilience Network

- 55 As a practical measure, the footway resilience network will be triggered at the same time as the road resilience network.

Treatment of Cycle Paths

- 56 Ensuring that, so far as is reasonably practicable, for cyclists the safe passage along a highway is not endangered by snow or ice involves a number of complex issues. Matters to be considered include the demand for cycling in severe winter conditions, where work undertaken by TfL has shown that there are significant seasonal fluctuations in cycling activity and that a correlation exists between cycling levels and low temperatures. Where it is considered that areas should be treated specifically for the benefit of cyclists as opposed to highway users in general, then the type and effectiveness of the de-iceant as well as the method of application needs careful consideration. This is because conventional road salt relies to a significant degree on being 'worked' by vehicle tyres or by foot, and treating cycle only routes with conventional road salt may not prove to be particularly effective.
- 57 Although not initially considered in the development of this review process, detailed consideration of such issues is important. Subject to any recommendations included in the Quarmby Report, discussions between LAP and TfL will determine how to take this work forward.

Pan London Strategic Salt Stock

National Salt Supply

- 58 The majority of highway de-icing salt used in the UK and London is supplied by two main UK mainland salt producers. Under normal conditions, these producers are able to supply London highway authorities at relatively short notice of anywhere between 1 and 5 days.
- 59 Alternative materials are available to use as a de-icing agents and are described in detail in Well-maintained Highways Appendix H and have also been investigated further by LoTAG. Rock salt may also be coated with agricultural bi-products or molasses. This approach has been adopted by some London authorities on the basis that the additive allows the salt to adhere to the road surface reducing the amount of waste. It is however more expensive than using conventional rock salt and therefore its use should be based on a sound business case and certainty that the anticipated benefits can be achieved. These anticipated benefits are still subject to research by the Highways Agency amongst others.
- 60 During the severe winter weather of 2008/09 and 2009/10 supply of salt proved problematic, leading to salt shortages. This led to national intervention and the formation of the Salt Cell. In winter 2009/10 London, formed the LSC, which was overseen by the London Severe Weather Gold Cell. This provided a single point of co-ordination for the supply of salt in London which proved successful.
- 61 As a consequence of the continued problems with the supply of salt during the past two severe winters, LoTAG has investigated the need to maintain a strategic stockpile of salt. This stockpile would be available for use by London highway authorities during severe winter weather. This approach builds on the recommendations of the UKRLG Report "*Lessons Learnt from the Severe Winter Weather February 2009*".

Storage Capacity

- 62 LoTAG has investigated the available storage capacity available to highway authorities in London. This work identified a total storage capacity across all London of approximately 80,000 tonnes, in a total of 40 separate storage facilities.
- 63 London's highway authorities utilise both open and enclosed or covered storage facilities. The majority of storage is open storage, approximately 60%. The remaining 40% is enclosed storage, which amongst other factors will keep the salt at a low moisture content enabling its useful life to be extended when compared to open storage. The adoption of closed storage by highway authorities is therefore a more efficient way to conserve salt in severe winter weather when re-stocking may be a problem. Therefore the size, type and location of salt storage facilities are key factors in influencing the efficiency and effectiveness of treating the network during severe winter weather.
- 64 Although a capacity of 80,000 tonnes is available, highway authorities have not utilised this maximum capacity during the winter period, with 56,000 tonnes entering the season 09/10. LoTAG has carried out a stock audit of highway authorities' preparedness for the 2010/11 season which is given in Appendix B. This suggests that at least some of London's highway authorities are not fully stocked, in line with the recommendations of *Well-maintained Highways*.
- 65 During severe winter weather, treatment of the normal network would use approximately 2,000 tonnes of salt per treatment at a dosage of 20g/m². Under these conditions *Well-maintained Highways* recommends successive salting which has been assumed to be a maximum of 6 treatments per day to meet resilience standards. Assuming London's highway authorities are stocked to capacity, they only have sufficient salt to treat their normal network for 6 days without re-supply. Currently, *Well-maintained Highways* recommends a resilience standard measured in days. Consideration is now given at national level at alternative ways of expressing resilience, eg,

number of treatments. London will continue to use days as a measure of resilience, as described above, until such time as a new national measurement of resilience is established,

Treatment of the Resilience Network

- 66 The London Road Resilience Network is described earlier in this document. This network is approximately 50% of the normal network. Should the decision be made to trigger this network, then London would have a maximum of 12 days capacity of salt without re-supply.

The Way Forward

- 67 Work undertaken by LoTAG has demonstrated that there has been an apparent lack of storage capacity for salt in London to deal with a severe winter. This lack of capacity coupled with logistical problem faced by the supply chain in production and distribution of salt has led to the conclusion that London needs a more resilient approach to the supply of salt. Work undertaken by TfL through LoTAG has recommended that London hold a strategic supply of salt for use by London highway authorities.

Pan London Strategic Stock

- 68 Work carried out on behalf of LoTAG recommended that a strategic stockpile of up to 50,000 tonnes would be required for treatment of carriageways and footways. This will provide London highway authorities with access to a central salt reserve in addition to their current individual stockpiles. This additional supply of salt will act as a buffer to allow winter service to be carried out as usual in the face of potential supply difficulties, as experienced in the previous two winters.

The strategic stockpile would also require adequate land to be obtained for storage of the stockpile, the location of this is currently being identified by LoTAG.



Interim Measures

- 69 As the time scales for implementation of the full stockpile are not achievable in advance of this winter season, an interim solution has been progressed by LoTAG for this winter.
- 70 These interim arrangements involve the deployment of a stockpile 25,000 tonnes located on existing GLA land and will be available for use during the 2010/11 winter season.

<http://www.tfl.gov.uk/winterservice>

Triggering the Pan London Strategic Stockpile

- 71 This strategic stockpile will provide an additional level of resilience to authorities when their own stockpiles are strained during periods of prolonged severe weather. Its existence does not obviate the need for authorities to comply with good practice, hold adequate operational stock at the local level and participate in mutual aid arrangements.
- 72 In order for the reserve to be effective, access to the strategic stockpile cannot be allowed to become an alternative for the maintenance of adequate local stock levels by the individual authorities.
- 73 In the first instance, highway authorities should use their own stockpiles of salt which should be maintained to meet good practice, as described in *Well-maintained Highways*. Where these stockpiles are insufficient to meet good practice, highway authorities should contact the London Severe Weather Gold Cell, as outlined in the Strategic Stockpile Protocol. The LSWGC will then oversee release of supplies from the strategic stockpile and mutual aid, as appropriate.
- 74 The protocol for the release of salt from the strategic stockpile has been agreed to ensure maximum usage from the salt stock, whilst providing the necessary resilience across London.

<http://www.tfl.gov.uk/winterservice>

Co-ordinated response to future salt shortages

- 75 This document sets out a number of practical measures that are now in place for a co-ordinated response to manage London's road network in severe winter weather. These measures have a number of levels of operation and involve a number of key stakeholders. These levels of operation are described earlier in this document and are set out below:

Better communication and planning to ensure effective treatment of the network during normal winter conditions

- 76 The London Winter Review Board under the guidance of LAP is working with highway authorities through LoTAG to ensure that London is better prepared. This work has included commissioning studies of salt stock, weather forecasting and footway treatments. It has also included agreeing a London Resilience Network, setting up interim measures for a strategic stockpile and auditing of pre-season stocking levels.
- 77 At this level the network will be treated in accordance with highway authorities' Winter Service Plans and no additional measures will be required. As part of this planning, highway authorities are required to co-ordinate with key stakeholders.

Implementation of a pan London network for footways and carriageways in severe winter weather when salt stocks fall below the resilience standard

- 78 During severe winter weather, the Resilience Network will be activated through the London Severe Weather Gold Cell (LSWGC), as outlined in section 42. Highway authorities will treat their network using their own supplies of salt, which should be maintained at the agreed resilience levels of 6 days.
- 79 At this initial level, the use of the strategic stockpile and activation of the LSC will not necessarily be required.

Activation of the strategic stockpile when usage continues during severe winter weather and salt stocks cannot be replenished

- 80 The strategic stockpile is managed by TfL and was created to mitigate risk of salt supply shortages in prolonged severe weather. Its existence does not obviate the need for authorities to comply with good practice, hold adequate operational stock at the local level and participate in mutual aid arrangements. Ownership of the salt rests with TfL.
- 81 Activation of the strategic stockpile may take place when authorities' stockpiles fall beneath the good practice, as described in *Well-maintained Highways*. Stockpiles may be re-stocked to maintain the resilience standard. During the winter season, LSWGC will authorise the release of salt from the strategic stockpile if required, which will be distributed by TfL.

The establishment of the LSC to prioritise the use of salt – a protocol was available which could be used again

- 82 In the event of continued severe winter weather where stockpiles cannot be resupplied to maintain the levels defined as good practice in *Well-maintained Highways*, even with the support of the strategic stockpile additional measures for prioritising the distribution of salt will be considered by LLAG.
- 83 Uncertainties over the delivery of salt in 2009/10 resulted in a decision by the London Severe Weather Gold Cell (LSWGC) to set up a multi-agency LSC to act to enable best use of salt supplies during the current severe weather situation. This has established the precedence for a similar protocol to be used in the future.

Approach adopted by the Salt Cell

- 84 The approach adopted by the LSC in 09/10 is described below.
- 85 To streamline mutual aid procedures, an agreement was made to utilise a London Single-point Depot (LSD) to effectively co-ordinate distribution. The prioritisation process entails a daily decision by the LSC regarding transfers from the LSD to Boroughs, based on each Borough's salt capability (current stocks against daily usage). Where there is insufficient stock in the SD, the LSC proposes specific mutual aid requests between Boroughs to ensure all Boroughs have sufficient stock.
- 86 In order to make mutual aid arrangements as effective as possible, timely and accurate reporting to the London Local Authorities Co-ordination Centre (LLACC) and shared ethos of stock usage is essential. With regard to the latter, the LSC scrutinises usage rates, identifies and shares good practice, and promotes consistency where practicable.
- 87 The actions and decision of the LSC are then analysed post-winter in order to capture lessons learnt as part of the process to strive towards continual improvement.

Next steps

- 88 The effective management of salt in terms of its supply, distribution and effective application is a key issue. The Winter Service Review Steering Group has commissioned a number of tasks to investigate how this can be managed more effectively. This document describes these tasks in detail.
- 89 A solution for the strategic stockpile, managed by TfL is now in place; LoTAG will need to implement the full strategic stockpile before winter season 2011/12.
- 90 Further consideration has to be made to a Pan-London approach to weather forecasting, which will provide more accurate information for decision makers, thus making more informed choices over the requirements for salt treatment.
- 91 Some of the improvements and considerations (eg determining resilience footway areas), are for individual London highway authorities to implement.
- 92 The London Winter Service Review Steering Group will continue to monitor London's readiness for severe winter weather. It will continue to hold workshops and communication events to ensure London's highway authorities and key stakeholders work together and understand each others' needs.
- 93 The Quarmby review is expected to publish its final report in the autumn 2010. The Winter Service Review Steering Group will review the report and consider any new recommendations relevant to London.

References

- 1. Keep London Moving Through Severe Winter Weather, Gritting Panel Review Team, December 2009
- 2. The Resilience of England's Transport Systems in Winter, An Independent Review, Interim Report, July 2010
- 3. Lessons from the Severe Weather February 2009, UKRLG Review, July 2009
- 4. Well-maintained Highways, Code of Practice for Highway Maintenance Management, UK Roads Board, July 2005

Appendix A

London Winter Service Review Steering Group

The London Winter Service Review Steering Group members are:

Dana Skelley	Transport for London	Joint chair
Gordon Prangnell	LB Hammersmith and Fulham	Joint chair
Ruth Seager	LB Tower Hamlets	
Martin Sachs	LB Lambeth	
Nick Lester	London Councils	
Dave Johnson	Transport for London	
Paul Eskriett	City of London Corporation	
Mark Sawyer	London Fire Brigade (Emergency Planning)	
Gretchen Fagg	London Fire Brigade (Emergency Planning)	Secretariat

The terms of reference for the review reported in this document are:



LoTAG Winter Service Review - 2010

Objective

To review the pan-London Winter Service and to make recommendations to improve the service in the light of the national grit shortage and the London response to the severe winter weather 2009/10.

LoTAG Winter Service Review Group Membership and Terms of Reference

The group would draw on key LoTAG members as required but would be led by Dana Skelley – Transport for London (Chair) and Gordon Prangnell – Hammersmith and Fulham.

The group would seek views or contributions from the LRT, the emergency services, the NHS, the voluntary sector and any other relevant partner agency as identified by the group.

The group would carry out or oversee the work carried out prior to reporting to the Local Authority Panel.

The group would:

- Report to CELC and TEC on proposed actions and outcome
- Consult with key local authority and community stake holders
- Work in partnership with TfL and all London boroughs
- Consult with Capital Ambition
- Seek to build on national guidance and local best practice
- Identify efficient and cost effective means of delivering the review and key tasks
- Appoint consultants to undertake specific key tasks where appropriate

Key Tasks

1. To identify areas for improvement in the current service
2. Identify areas of good practice to build upon and promote/disseminate to all partners & local authorities
3. To develop a Winter Service Review Work Programme
4. Run a workshop with all relevant players
5. To analyse and present options for pan-London procurement and strategic storage of de-iceant
6. To determine a clear and consistent definition of road and footway resilience networks
7. To commission an independent review of pan London resilience road network
8. To commission an independent review to the development of a consistent pan London resilience footway network including a review of accident data; determination of areas of greatest footfall and sites of strategic importance
9. To analyse the effectiveness of the pan London Weather service and to make recommendations for improved efficiency
10. To provide guidance on footway gritting equipment and footway gritting regimes

Programme

1. Report proposals to CELC in March 2010 and London Council's TEC in May/June 2010
2. Workshop - from May 2010 but to consider any National review (£3k)
3. Strategic salt procurement and storage – mid May 2010 (£5k)
4. Review of the resilience network (£35k)
 - Stakeholder consultation March to May 2010
 - Publish revised networks no later than September 2010.
5. Footway gritting equipment review – complete by July 2010 (£3k)
6. Weather Service Review – June to September 2010 (£3k)
7. Present findings and results September 2010

Resources

1. To identify –£50k resources for undertaking this work

Dana Skelley & Gordon Prangnell

Revised 2 March 2010

Appendix B

London Highway Authorities Pre-season Salt Stock

Note that the intended stock level should always be greater than the resilience benchmark stock level in order to allow for consumption and time taken to restock under normal conditions. The resilience benchmark of 48 runs of normal network is in accordance with the recommendation of the Final Report of the Winter Resilience Review. Some London Boroughs have limited storage space and hence, limited salt stocks. Some of them have however made arrangements with their salt suppliers for quick re-stocking, if required.

A completed table will soon be added to reflect the intended salt restock for each London Local Authority. The table below has been provided for reference purposes only and will be updated when data is confirmed.

Highway Authority	Resilience Benchmark Stock Level (48 runs) (t)	Intended Stock Level (t)	Variance (t)	Ordinary Treatment Network Length (km)
Authority A	3600	6000	2400	
Authority B	2160	7800	5640	
Authority C	3240	6000	2760	
Authority D	1400	600	-800	
Authority E	250	500	250	

London Winter Service
Review Steering Group

LLACC.LINK@london-fire.gov.uk