# BBMM

# AREA 10

# SEVERE WEATHER PLAN

# 2013/2014

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# 1 INTRODUCTION

Severe Weather refers to any meteorological phenomena with the potential to endanger safe passage or cause disruption on the Area 10 Network, and includes snow, ice, heavy rain, high winds, fog and high temperatures. As such year round planning is required to manage Severe Weather events in an appropriate manner.

Severe Weather Service comprises the operational and alert procedures, and actions necessary to ensure safe passage on the Area 10 Network is not endangered by Severe Weather, as far as is reasonably practicable. Winter Service is the element of Severe Weather Service which focuses on the routine precautionary and reactive treatments required to keep lanes on the Area 10 Network free of ice and snow.

This section of the Severe Weather Plan outlines the scope of the services provided, responsibilities for provision of those services and details the extent of the Area 10 Network on which the service is provided. The definitions and abbreviations are provided in Appendix A.1.

This Severe Weather Plan for Area 10 describes the procedures and operational arrangements for the delivery of an effective Winter Service, to ensure safe passage for customers using the highway, and details the alert procedures and actions in the event of other Severe Weather. It is a mandatory requirement for the Service Provider to demonstrate their preparedness by developing this Severe Weather Plan. Instruction and contextual guidance to help the Service Provider compile the Severe Weather Plan is appended.

BBMM will ensure the operational activities contained in this plan dovetail with other Highways Agency's Severe Weather Plans (e.g. Traffic Officer's Severe Weather Plan) and the Crisis Management Manual.

The document serves a number of specific purposes:

- Contract Document - The Severe Weather Plan outlines contractual responsibilities of the Highways Agency and their Service Provider.
- Quality Plan - The Severe Weather Plan forms part of Service Provider's quality or business management system.
- Contingency Plan - The Severe Weather Plan is linked with the Highways Agency's wider contingency arrangements.
- Operations Manual - The Severe Weather Plan describes the processes, procedures and operational arrangements for those responsible for delivering Winter Services and details the alert procedures and actions in the event of Severe Weather.
- Reference Document - The Severe Weather Plan is a comprehensive reference document.

## 1.1 Statement of service

BBMM will endeavour to fulfil the Highways Agency's Severe Weather Requirement within Area 10 in an efficient and safe manner.

### 1.1.1 Risk periods

The year round weather service provided through HAWIS facilitates improved planning and warning for Severe Weather events. Certain weather types can be expected during particular risk periods, these are shown below for guidance. This does not absolve the Service Provider of the obligation to provide an appropriate service at any other time of the year if the need arises.

| Weather Type | Risk Periods (months inclusive) |
|---|---|
| Snow, Ice and Freezing rain | October through to April |
| Heavy rain | January through to December |
| High winds (including Severe Gales and Storms) | September through to June |
| Fog | October through to January |
| High temperatures | June through to August |

### 1.1.2 Service timetable

Key dates for the provision of reports and preparedness are summarised in the following table.

A checklist is provided in Appendix A.2.

| Date | Who | Action |
|---|---|---|
| 21 August | Service Provider | Submit Severe Weather Plan *hold point* |
| 18 September | HA Service Manager<br>HA National Winter & Severe Weather Team | Check and accept Severe Weather Plan |
| 30 September | | Operational Summer Period concludes |
| 1 October | | Operational Winter Period commences |
| Monthly from 15 October | Service Provider | Complete and submit Non warranty defect report spreadsheet |
| No later than end of October | Service Provider | Completion of Snow Desk exercises |
| No later than end of November | Service Provider | Completion of Severe Weather briefings |
| Between 1 December and 31 March | Service Provider | Include daily Vehicle Off Road (VOR) numbers on defect reports |
| by 18 December | Service Provider | Feedback and action planning from exercises and briefings |
| 1 March | Service Provider | Review and update the Winter Service and Severe Weather infrastructure inventory database |
| 30 April | Service Provider | Finalise list of lessons learnt (or update Severe Weather Action Plan (SWAP) to feed into the Operational Assessment Report |
| 30 April | | Operational Winter Period concludes |
| 1 May | | Operational Summer Period commences |
| May | Service Provider | Winter & Severe Weather review |
| 31 May | Service Provider | Submit Salt Restocking Plan *hold point* |
| 30 June | HA Service Manager<br>HA National Winter & Severe Weather Team | Check and accept Salt Restocking Plan |
| June | Service Provider | Winter & Severe Weather report to HA (Operational Assessment Report) |

### 1.2 Contractual arrangements

Winter Service duties including precautionary treatment, reactive treatment and snow clearance are the responsibility of BBMM.

Severe Weather duties including operational considerations, alert procedures and actions are the responsibility of BBMM.

#### 1.2.1 Liability

Where arrangements are made with other service providers or Highway Authorities for Winter Service provision and Severe Weather actions to be provided by them on the Area 10 Network, it is the responsibility of BBMM to ensure such service has been carried out. Arrangements made do not absolve the Service Provider's obligations.

### 1.3 Network

#### 1.3.1 Description of Network

The Area 10 Network covers a large geographical area of the north west of England. The Area has a large variation in weather conditions due to undulating topography.

Routes to the west of Area 10 are Coastal. Routes to the North and East are predominantly high level and rural. Routes to the South of the network are rural. The City of Manchester is at the centre of the network surrounded by numerous conurbations. Part of the Area 10 Commission is to manage the section of the M62 which at its summit is the highest section of motorway in England (in addition to the Area 10 SWP there is an additional M62 Cross Border Plan which gives additional information for the planning and management of this route). There is also a great variation in the type of route, from single carriageway APTR through to 4-lane sections of strategically important motorway.

The varied and very heavily trafficked network complicates winter maintenance operations and decision making. There is a great deal of mapping information available to the Severe Weather Officer (SWO) in this document and also the Area 10 Contingency Plan. However local network knowledge is invaluable. This is developed from the operational experience of the Decision Maker supported by experienced verifying staff.

#### 1.3.2 Extent of Area Network

The extent of Area 10 Network covered by this plan is shown in the following table and also detailed in the Area Map at Appendix A.3. The key interfaces are defined in the interface drawings which are included within Appendix A.4.

| Extent of Network | | |
|---|---|---|
| Road | Extent | Length (km) |
| A55 | Welsh Border to M53 Junction 12 | 13.533 |
| A483 | Welsh Border to A55 Chester | 4.1765 |
| A59 | Switch Island gyratory (A59) | 1.255 |
| A580 | Section of Main c/way through the centre of M6 J23 | 0.35 |
| A5117 | M56 Dunkirk RAB to A540 Park-gate Road Junction | 1.118 |
| A494 | M56 Dunkirk RAB to A550 / Welsh Boarder. | 4.4875 |
| A550 | Welsh Border to A41 | 7.8955 |
| A41 | A550 to M53 Junction 5 | 0.6275 |
| M53 | Junction 1 to Junction 12 | 31.876 |
| M56 | M60 Junction 4 to A5117 | 55.632 |
| M6 | Junction 16 to A675 High Walton Viaduct MP 347/3 | 86.356 |
| A556 | M56 Junction 7 to M6 Junction 19 | 6.7525 |
| M60 | Junction 1 to Junction 27 (complete route) | 58.1355 |
| M62 | Junction 6 to Junction 12 (where it meets M60) | 32.000 |
| M62 | Junction 18 to Junction 22 (Area 10/12 boundary) | 19.115 |
| A5103 | M60 Junction 5 to M56 Junction 3 | 2.0025 |
| M67 | M60 Junction 24 to Roundabout Junction with A57 | 7.6555 |
| A627 (M) | Rochdale A664 to Chadderton A663 | 6.606 |
| A663 | A627 (M) Chadderton to Manchester Boundary | 4.3605 |
| M602 | M60 Junction 12 to A5063 / A57 | 6.9475 |
| M61 | M60 Junction 14 to M6 Jct 30 | 43.5925 |
| M66 | M60 Junction 18 to Junction with A56 | 14.2965 |
| M57 | M62 Junction 6 to M57 Junction 7 (Switch Island) | 16.088 |
| A5036 | A565 to M57 Junction 7 (Switch Island) | 5.249 |
| M58 | M57 Junction 7 (Switch Island) to M6 Junction 26 | 18.657 |
| M65 | Junction 1a to Junction 10 | 32.2375 |
| A56 | M65 Junction 8 to M66 North End | 15.0835 |

| Sections of three lane or more carriageway | | |
|---|---|---|
| Road | Extent | Number of lanes |
| M53 | 3 lane sections: Junction 5 to Junction 1. Junction 10 to Junction 11 | 3 |
| M56 | 3 lane sections: Junction 15 to Junction 6. Junction 3 to Junction 3a | 3 |
| | 4 lane sections: Junction 6 to Junction 3 | 4 |
| M6 | 3 lane sections: Junction 16 to Junction 20. Junction 21a to Junction 29 | 3 |
| | 4 lane sections: Junction 29 to A675 High Walton Viaduct MP 347/3 | 4 |
| M60 | 3 lane sections: Junction 1 to Junction 3. Junction 3 to Junction 5. Junction 8 to Junction 12. Junction 19 to Junction 22. Junction 24 to Junction 1 | 3 |
| | 4 lane sections: Junction 3 to Junction 4. Junction 5 to Junction 6. Junction 12 to Junction 19. Junction 22 to Junction 23. Junction 23 to Junction 24 | 4 |
| M62 | 3 lane section: Junction 6 to Junction 8. Junction 10 to Junction 12. Junction 18 to Junction 21 | 3 |
| | 4 lane sections: Junction 8 to Junction 10.Junction 11 to Junction 12. Birch Services to Junction 18 (W/B only) Junction 21 to Junction 22 | 4 |
| A5103 | 3 lane sections: M60 Junction 5 to M56 Junction 3 | 3 |
| M67 | 3 lane sections: M60 Junction 24 to Mottram Roundabout Junction with A57 | 3 |
| A627 (M) | 3 lane sections: M62 J 20 Thornham Roundabout to Slattocks Link Junction | 3 |
| M602 | 3 lane sections: M60 Junction 12 to Junction 2 | 3 |
| M61 | 3 lane sections: Junction 3 to Junction 9. Junction 14 to M6 Jct 30 | 3 |
| | 4 lane sections: Junction 2 to Junction 3 | 4 |
| M66 | 3 lane sections: Junction 2 to Junction 3 | 3 |
| | 4 lane sections: Junction 3 to Junction 4 (S/B only) | 4 |
| M57 | 3 lane sections: Junction 1 to Junction 7 (Switch Island) | 3 |
| M58 | 3 lane sections: Junction 1 to M6 Junction 26 | 3 |
| M65 | 3 lane sections: Junction 1 to Junction 2. Junction 2 to Junction 3. Junction 4 to Junction 5 | 3 |
| | 4 lane section: End of Junction 6 exit slip | 4 |

| Footway and cycle track routes | | | | |
|---|---|---|---|---|
| Category | From | To | Route Description | Map ID |
| 2 | A627(M) Chadderton | Moston Lane East Junction | A663. Urban foot path with Schools, shops and offices. | A.4.Footway and Cycle Routes |
| 2 | M57/M58 Switch Island | A595/A565 Crosby Road RAB | A5036. Urban foot path with Schools, shops and offices. | A.4.Footway and Cycle Routes |
| 3 | M60 Junction 5 | M60 Junction 3a | Low use foot path | A.4.Footway and Cycle Routes |

### 1.3.3 Network Features

BBMM has identified the following network features that require special consideration with regard to weather within the Network, and features that occur at boundary interfaces. Details of each Network Feature are contained in Appendix A.5.

### 1.3.4 Vulnerable locations

Certain locations on the network are particularly vulnerable to severe weather conditions. In addition there are a number of locations where although problems may not have actually occurred, due to a number of factors they may be at increased risk of suffering problems during a severe weather event. These vulnerable locations (or trouble spots) requiring special consideration and mitigation measures within the Network include:

- *parts of the network at high altitude;*
- diversion routes that may be affected by severe weather;
- *areas prone to low temperature/low humidity conditions where special measures may be required;*
- *sections of road of a gradient or road radii that may result in problems in certain conditions e.g. jack knifed lorries or HGVs failing to gain traction;*
- *areas commonly prone to climatic conditions such as strong cross winds that would result in snow drifting, localised heavy snow patterns and overturned vehicles;*
- *parts of the network at risk of flooding resulting in lane/road closures;*
- *any structures where differential treatments or special measures may be required;*
- *low temperature, low humidity problem spots require mapping as these may require additional treatments;*
- *areas where, from experience, particular problems arise where the service provision can be hampered, including traffic calming areas;*
- *major transport hubs e.g. Heathrow Airport, Port of Dover etc; (This inclusion is mandatory, with a requirement to identify all major transport hubs and any special measures to be implemented during severe weather);*
- *areas of the network prone to accidents.*

The following table shows the location and brief key word summary of the problem. Each is cross referenced to detailed individual site mitigation plans contained within Appendix A.20. These must be reviewed at a minimum annually.

| Vulnerable Locations | | |
|---|---|---|
| **Location** | **Reference** *To individual mitigation plan* | **Problem (very brief summary)** |
| A56 The A56 from the M66 Jct. at Edenfield to M65 Jct. 8 | A.20 VL 01 | Area is high level and exposed. It is susceptible to inclement weather due to its elevation above sea level. The area around rising bridge roundabout (A680) is particularly at risk. |
| M62 J21-22 | A.20 VL 02 | High level and exposed and regularly experiences inclement weather due to its elevation above sea level.<br>This section of road also has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| M62 MP 74/5 (between Jct. 21 & 22) | A.20 VL 03 | Area is vulnerable to extremes of weather due to its elevation above sea level including drifting and icing. This is due to a small valley intersecting a cutting slope which can channel cold air. |
| M67 J4 | A.20 VL 04 | The eastern end of the M67 gradually rises toward the Pennines where it becomes high level. This section is exposed and regularly experiences inclement weather due to its elevation above sea level. |
| A5036 / M57 Various | A.20 VL 05 | The A5036 and M57 are susceptible to standing water resulting and a risk of ice formation during periods of adverse weather. This is due to the generally flat low lying nature of the topography and carriageway. |
| M60 Jct. 19 – 24 | A.20 VL 06 | The M60 between Jct. 19 – 24 can suffer from standing surface water. A scheme to rectify this problem has now been completed. The area is monitored regularly. |
| M60 Jct. 17 | A.20 VL 07 | The drainage on the A carriageway exit slip is susceptible to flooding. The drainage system had works carried out during 2011 / 12 (small works programme). Area to be monitored this winter. |
| M65 J6 WB exit | A.20 VL 08 | M65 Jct. 6 Westbound exit slip has occasionally suffered from surface water run-off at the point where it crosses the M65 main carriageway. If this occurs sand bags are filled with salt and laid in the path of any seepage. Salt bags are deployed and monitored by MRTs to ensure that any run off is saline. |
| A55 Sainsbury's Roundabout | A.20 VL 09 | A55 lay-by closest to the Sainsbury Roundabout on the outskirts of Chester has a known run-off problem. The carriageway in the lay-by can be wet even if there has been no recent rainfall. Salt bags are deployed and monitored by MRTs to |

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| | | ensure any run off is saline. |
| M66 NB J1 | A.20 VL 10 | The M66 NB just to the north of Jct. 1 has in the past suffered from run-off. Over the past 4 seasons this has not re-occurred although winter maintenance personnel should be aware of the potential issue. Salt bags can be deployed and monitored by MRTs to ensure any run-off is saline. |
| M60 Barton Bridge | A.20 VL 11 | This section of road has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| A56 Rising Bridge | A.20 VL 12 | This section of road has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| M67 Jct. 3 - 4 | A.20 VL 13 | This section of road has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| M65 Jct. 3 – 5 | A.20 VL 14 | This section of road has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| M60 Jct. 15 – 17 | A.20 VL 15 | This section of road has a steep gradient that may result in problems if snow falls, e.g. jack knifed lorries, loss of traction etc. |
| Manchester Airport, M56 Jct. 5 | A.20 VL 16 | Manchester Airport is a major airport located within Greater Manchester; this is reached by the M56 with a dedicated approach road from the motorway at junction 5. It is 4th busiest airport in the United Kingdom in terms of passenger numbers.<br>BBMM will inform Manchester Airports Group of winter maintenance decisions and any severe weather events likely to cause disruption to passengers travelling on the Strategic Network. |
| Liverpool Airport, M53, M56, M57 & M62 | A.20 VL 17 | Liverpool John Lennon Airport is an international airport serving the North West of England; the airport is readily accessible by the M53 and M56 motorways via the A533 / Runcorn Bridge to the south, and the M57 and M62 motorways via the Knowsley Expressway to the north of the airport.<br>It is 10th busiest airport in the United Kingdom in terms of passenger numbers.<br>BBMM will inform Liverpool John Lennon Airport of winter maintenance decisions and any severe weather events likely to cause disruption to passengers travelling on the Strategic Network. |
| Seaforth Dock, M57, M58, M62, A5036 | A.20 VL 18 | Seaforth Dock is a purpose-built dock and container terminal to the north of Liverpool, the docks are readily accessible by the M57, M58, |

| | | |
|---|---|---|
| | | M62 & the A5036.<br>This carries approximately 70% of the North West of England's freight.<br>BBMM will inform Mersey Docks and Harbour Company of winter maintenance decisions and any severe weather events likely to cause disruption on the Strategic Network. |
| M58 | A.20 VL 19 | The M58 over the past 3 winters has suffered from snow freezing in lane 3, this then becomes difficult to de-ice as conventional methods don't work.<br>This is further compounded as this 12 mile section of Motorway is lightly trafficked and is categorised as a green route.<br>Further information regarding this can be found in Section 5.2.2 |
| M60A J2 Entry (Roscoe's RAB) | A20 VL 20 | Area is susceptible to flooding during prolonged periods of rainfall. Drainage system is slow to drain away. Drainage investigations & scheme being developed. |
| M60 J16-17 | A20 VL 21 | Severe flash flooding 05/08/12, lead to water cascading onto M60A 27/4 Molyneaux Brow R/W. Embankment scour at M60B 28/4 Park Farm occurred at same time. Repair work has been carried out. Drainage appears to be working. The locations will continue to be monitored to see if repeat flooding occurs. |
| M60A & B J19-20 (M60 Contract 3) | A20 VL 22 | Scheme works have been undertaken to rectify drainage issues. However, there is still water permeating upwards through the surfacing. The WM treatment route M4 has been revised to include a blast treatment in this area.<br>There is also water seeping through the embankment and running onto the carriageway. MRTs to place salt bags at foot of embankment to ensure any run off is saline, during winter period. |
| A56 S/B Woodcliffe Cutting | A20 VL 23 | Area is a known landslip site. The area is being monitored, especially during/after heavy rainfall. A geotechnical stabilisation scheme is being developed. This site has its own bespoke Contingency Plan. This is contained with the Box of Reference of the main Area10 Contingency Plan. |
| A627(M) N/B J3-4 Barnfield Construction Site | A20 VL 24 | The site development (off network) at the top of the embankment had severe run off onto the A627 (M) below during periods of prolonged rainfall during construction. A pump was left on site at the bottom of the embankment that could be jointly operated between the site and MRTs to control any potential flooding. The site permanent |

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| | | drainage connections have now been completed. The site will be regularly inspected to see if it has been successful. It will be removed from the vulnerable list if there is no longer any issue. If runoff is still present salt filled bags may need deploying to ensure run off is saline. |
| M62 E/B & W/B J22 MP 74/0 – 75/0 | A20 VL 25 | Run off from farmers fields, during prolonged periods of rainfall have lead to flooding on the carriageway. The H block channels have been cleaned out and a drainage improvement scheme is underway. If this is not rectified by the start of winter salt filled bags may need deploying to ensure run off is saline |
| A550 N/B Ledsham Hall Lane - Badgersrake Lane BT manhole | A20 VL 26 | A BT manhole was filling with water and overflowing on to the carriageway during the last winter period. This was causing localised patches of ice to form. A preventative separate blast treatment is carried out if the temperatures are to drop below zero. BT have carried out some drainage works since. The area is to be monitored this winter and if flooding occurs again, blast treatments will be carried out the same as last year. |
| A556 Bowdon RAB Culvert | A20 VL 27 | Culvert is susceptible to flooding during prolonged periods of rainfall. It is on the flood risk register & monitored regularly. |
| M53 J2 S/B Exit Structures | A20 VL 28 | The Structure of Moreton East has a 7.5T Weight Restriction imposed under TTRO. Moreton South is also being assessed. Winter Maintenance vehicles are allowed to cross the structures with a maximum grass load of 16T. Treatment Route C2 has this clearly shown on the Route Card & Map. |
| M56 J7 E/B Access Landslip | A20 VL29 | A landslip has occurred to section of embankment. This is currently contained behind Varioguard and regularly checked by MRT to ensure no encroachment onto Hardshoulder. Frequencies of inspection are increased after prolonged rainfall. |
| M6 J26-27 Gathurst Viaduct | A20 VL30 | Twice in the last 3 winter seasons, extreme snowfall has played a part in bringing the M6 carriageways to a standstill, partly due to the gradient. This occurs very infrequently only under specific weather conditions, but has dramatic effects. Weather patterns are to be closely monitored in advance of snow events and additional resources deployed to provide Extra Effort between M6 J23-28, if conditions dictate. |
| M6 N/B exit into Charnock Richard MSA | A20 VL31 | The drainage system has been damaged by tree routes and causes flooding of the lanes during periods of heavy rainfall. Weather conditions are to be monitored and secondary resources dispatched early to remove the water until the permanent rectification scheme has been |

| | | |
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| | | delivered. |
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# 2 GENERAL PLANNING

## 2.1 Operational planning

This section of the Severe Weather Plan contains BBMM's general operational procedures for delivery of Winter Service and details the alert procedures and actions in the event of Severe Weather on the Area 10 Network and includes arrangements for liaison and co-operation with key stakeholders to promote delivery of a consistent and co-ordinated service.

BBMM will endeavour to follow the guidance given in all relevant Area Management Memos relevant to Severe Weather Operations and Planning including AMM 141/13 with regard to "mutual aid".

BBMM also recognise that co-operation and liaison with the emergency services, HA Traffic Officers, adjacent authority agents and other relevant stakeholders is vital to ensure that an appropriate and consistent winter maintenance service is provided both within Area 10 and beyond the boundaries of the trunk road network.

BBMM's principal contact numbers are:-

24 hour emergency [redacted]

Business Continuity Number [redacted]

E-mail: mailto[redacted]

Please refer to Appendix A.4 for Interface Boundary Plans.

Operational procedures detailed in this Severe Weather Plan will be tested through a Severe Weather Desk exercise. BBMM will plan and execute a Severe Weather Desk exercise prior to the Operational Winter Period to test the delivery and resilience of the Severe Weather Plan and identify areas for improvement. Planning for the exercise must be in consultation with the Service Manager, Emergency Planning Managers and the National Winter & Severe Weather Team to ensure critical and vulnerable points in the service are tested (Appendix B.1).

BBMM will hold Severe Weather briefing sessions prior to the Operational Winter Period to ensure the relevant stakeholders are fully briefed. Feedback and actions will be reported to the National Winter and Severe Weather Team as per the service timetable (Section 1.1.2). An example attendance register and summary of actions template are contained in Appendix B.1.

### 2.1.1 General arrangements

#### 2.1.1.1 Process

The variable nature of the weather conditions expected across the Area 10 network is monitored on a 24/7 365 day a year basis by a BBMM Severe Weather Officer (SWO). The BBMM Network Control Centre (NCC) is situated within the North West Regional Control Centre (RCC). The BBMM SWO has access to qualified Meteorologists on a 24/7 365 day a year basis. The SWO has access to weather forecast information and real time weather information provided by Road Weather Information Sites (RWIS). The SWO will monitor the conditions against the forecast and advice the Severe Weather Verifier who will assess the situation and will either confirm decisions or impose changes if required.

A continuous SWO presence in the NCC ensures that prompt and appropriate actions are taken in response to changing weather conditions. The SWO will direct Winter Maintenance operations and liaise with neighbouring authorities as required ensuring continuity and consistency of Winter Maintenance actions.

Outside the winter period the SWO in the NCC will liaise with the on duty Silver Manager to ensure that the correct actions are verified upon receipt of Severe Weather Warnings from the Met Office.

2.1.1.2 Decision Maker

- The duty SWO (NCC Network Stewards) will be responsible for liaison with the` forecast provider (Met Office) and decision making. This decision is then verified as detailed below. Details of SWO staff can be found in Section 3.1.1

Severe Weather Verifier (SWV)

- The SWV will verify the decisions made by the SWO prior to the SWO issuing notification of proposed treatments. Details of SWV staff can be found in Section 3.1.1

Duty Supervisor (DS)

The DS will receive notification from the SWO via email and verbally so that the DS can organise the required resources to carry out treatments as required. DS rotas are produced and distributed on a weekly basis by the NCC

Network Control Centre (NCC)

- During the Winter Maintenance season the NCC will ensure that the initial daily winter maintenance instruction is submitted the Highways Agency's Winter Report Form (WRF1) website. Any further instructions to treat will also be submitted.

The NCC will also update One Place with details of the start and finish time of each vehicle ensuring that accurate records are kept to comply with PMF 5.3b

The Network Manager & NCC will ensure that PMF 5.3a, b, c, & f are reported on and met.

The key personnel responsible for delivery of the services defined within this document are detailed in Section 3.1.1.

2.1.1.3 Duty Rota

The Decision Maker Duty Rota is included at Appendix A.6.

2.1.1.4 Salt management

BBMM will develop and submit a Salt Restocking Plan (Service Timetable Section 1.1.2), providing evidence for supply arrangements, including the Reporting Threshold profile (with supporting evidence) in line with the Minimum Contractual Salt Stock Levels (Appendix B.3). A template for Service Providers to complete is contained in Appendix A.21.

The Salt Restocking Plan is to be submitted by 31st May.

The Threshold Reporting Profile for re-ordering 6.3mm Rock Salt is shown below.

The Profile has been set using historical data. It varies monthly during the winter period. It is set at a level, so that restocking commences, prior to minimum Suggested Operating Levels (formerly Minimum Capability Levels) are met.

This is in accordance with the Contractual Salt Stock Levels shown in Table Appendix B3.

Minimum Contractual Salt Level amended & agreed with [redacted] 16/08/13.

Even though Minimum Contractual Stock is shown as [redacted] this will only be applicable April – September. Minimum Suggested Operating Levels will be used as Minimum Contractual Stock as per the above.

### 2.1.2 Liaison and arrangements

The management of the Network and the interface with other networks is essential to the consistent provision of Winter Service and actions in the event of Severe Weather. Liaison with Traffic Management Directorate (TMD) is also important to provide up to date customer-facing functions such as traffic information, active management of traffic flows and incident response.

#### 2.1.2.1 Internal communication arrangements

BBMM will provide and maintain an effective telecommunications system between the Service Manager, the Service Provider's supervisory staff and operational vehicles. Mobile telephone communication must not be relied upon since these can become over loaded particularly during extreme conditions, or in the event of an incident causing major congestion.

The communication system for all Winter Service Vehicles and the back-up communication system for all Winter Service Vehicles include.

Internal communication is by e-mail, Airwave radio, landline telephone and cellular telephone.

Winter service vehicles primary communication is via a cellular mobile phone to the NCC, if the mobile network should fail then communications will be via road side SOS boxes.

The arrangements for backup communications consist of a grab bag located in the NCC. The grab bag contains a laptop computer and a cellular mobile telephone.

A back up Network Control Centre is located at Westhoughton depot. This can be utilised should the need arise and is documented in the Business Continuity Plan.

A comprehensive internal contact list can be found in Appendix A.7.

#### 2.1.2.2 External communication arrangements

BBMM has established clear lines of communication and agreed contact names and numbers to ensure communication is possible at all times.

The following table indicates the contacts of stakeholders who are important to [redacted] operational effectiveness.

| Road | Location | Contact |
|---|---|---|
| M62 | J22 Windy Hill (Area 12 interface) | [redacted] |
| M6 | J31 (Area 13 interface) | [redacted] |
| M6 | J16 (Area 9 interface) | [redacted] |

A comprehensive external contact list can be found in Appendix A.8.

2.1.2.3 Liaison with major highway schemes

| Road | Location (e.g. junction to junction) | Type of scheme | Contact |
|---|---|---|---|
| A55 | E/B & W/B Welsh Border to A483<br>23/10 – 12/11/13 | Roads<br>Pavement | [redacted] |
| A556 | J7/8 Bowdon RAB<br>14/11 – 18/12/13 | Electrical<br>Lighting | [redacted] |
| A627(M) | J1-4 E/B & W/B 1/0 – 5/9<br>12/12/13 – 20/01/14 | Electrical<br>Lighting | [redacted] |
| M53 | J10 S/B 33/2 – 34/7<br>05-11/11/13 | Roads<br>Pavement | [redacted] |
| M53 | J11-12 N/B & S/B Stoak to Hoole Bank<br>01-21/10/13 | Roads<br>Pavement | [redacted] |
| M56 | J1-2 E/B & W/B Cheadle Branch Railway<br>02/04 – 25/10/13 | Structures<br>Parapets | [redacted] |
| M56 | J3A E/B & W/B Altrincham Road North & South<br>14/01 – 31/03/14 | Structures<br>Parapets | [redacted] |
| M56 | J8-9 E/B & W/B Gale Bog to Beech Tree<br>22/01 – 18/03/14 | Roads<br>VRS & Pavement | [redacted] |
| M56 | J8-9 E/B & W/B Phase 2 25/0 -27/2<br>22/01 – 15/04/14 | Roads<br>VRS | [redacted] |
| M56 | J11 Daresbury Improvement<br>23/04 – 30/07/14 | Pinch Point<br>Localised widening & Signalisation | [redacted] |
| M58 | E/B Switch to J1 11/4 – 14/0<br>15-28/11/13 | Roads<br>Pavement | [redacted] |
| M6 | J16-19* | Managed Motorways | [redacted] |
| M6 | N/B & S/B J18-19 Lower Peover to Cranage<br>30/09 – 18/10/13 | Roads<br>Pavement | [redacted] |
| M6 | N/B & E/B J22-23 Lowton (Side Span)<br>06/11/13 – 03/07/14 | Structures<br>Painting | [redacted] |

| | | | |
|---|---|---|---|
| M6 | J26 East Roundabout<br>19/02 – 30/07/14 | Pinch Point<br>Localised widening & Signalisation | [redacted] |
| M6 | N/B & S/B J27-29 334/0 – 343/0<br>01/10 – 25/11/13 | LNMS<br>VRS | [redacted] |
| M6 | N/B & S/B J28-29 Rose Whittle Railway<br>21/01 – 27/05/14 | Structures<br>Concrete Repairs | [redacted] |
| M60 | A & B J13-15 Bridgewater to Wardley<br>13/11/13 – 17/01/14 | Roads<br>Pavement | [redacted] |
| M60 | A & B J15 Wardley Hall<br>17/12/13 – 09/01/13 | Structures<br>Concrete Repairs | [redacted] |
| M60 | A & B J16-17 Robin Hood Railway & Irwell Valley 26/4 – 26/9<br>04-17/02/14 | Roads<br>VRS | [redacted] |
| M60 | J24 Denton Roundabout<br>29/10/13 – 30/05/14 | Pinch Point<br>Localised widening & Signalisation | [redacted] |
| M60 | A & B J24-27 Portwood to Crookilley 51/5 – 55/1<br>03-16/12/13 | Roads<br>Pavement | [redacted] |
| M61 | N/B & S/B Linnyshaw Moss to A666<br>23/01 – 28/04/14 | Roads<br>VRS & Pavement | [redacted] |
| M62 | E/B & W/B J11-12 Bumps (2013-14) 34/0 -37/0<br>02-22/10/13 | Roads<br>Pavement | [redacted] |
| M62 | E/B & W/B J19-20 Birch to J20 58/8 – 65/2<br>26/11/13 – 16/01/14 | Roads<br>Drainage | [redacted] |
| M62 | E/B & W/B J20-21 J20 to Broad Lane 64/5 – 66/3<br>19/11/13 – 09/01/14 | Roads<br>VRS | [redacted] |
| M62 | E/B & W/B J21 Ashfield & New Hey Road 67/9 – 68/8<br>02-29/01/14 | Roads<br>VRS | [redacted] |
| M67 | E/B & W/B J1-3 2/0 – 6/0<br>14/11 – 04/12/13 | Electrical<br>Lighting | [redacted] |

| | | | |
|---|---|---|---|
| M602 | E/B & W/B J1-3 3/0 – 6/9<br>18/12/13 – 31/01/14 | Electrical<br>Lighting | [redacted] |
| | | | |
| | | | |

2.1.2.4 Mutual aid agreements

Mutual aid is where one service provider may have a resource issue, a second or third (etc) service provider will assist in delivering the same goal. Mutual aid can be, from the sharing of resources such as salt, the sharing of facilities that may provide improved resilience of the Area 10 Network or the provision of a full Winter Service to a particular part of another network. For example, there are local roads that service providers may treat to ensure their own operational effectiveness such as access routes to depots.

It can also be used to provide support to, or obtain support from, other network operators during times of stress, such as during Severe Weather, to the benefit of the road users. The provision of support at such times and capabilities of provision should be discussed and contact details agreed.

Cross Border Mutual Aid arrangements are detailed within the M62 Cross Border Plan which can be found in Appendix A.9. Arrangements have been established for the winter season 2013/2014 with the previous Service Provider and these will continue post the access date.

BBMM will document all requests for support from, or to, other operators and the subsequent decisions, with reasons, by completing the Mutual Aid Agreement forms. Completed forms can be found in Appendix A.9 *(an electronic version of the template is available from the Service Manager)*.

BBMM will submit signed copies of completed forms to the Service Manager for approval with additional copies issued to the provider/recipient of mutual aid. It is noted that mutual aid arrangements do not absolve BBMM's obligations.

2.1.2.5 Cross boundary agreements

BBMM will ensure the cross boundary agreements are in place at the interface of the Area 10 Network and adjacent networks to ensure a consistent service that will not leave potentially important sections of either network untreated.

The M62 J22 presents the biggest risk due to inclement weather (snow), because of this there is a bespoke Cross Border Plan, the key agreements within this plan are as follows;

- Area 12 have use of Milnrow Depot for reloading of salt
- Area 10 has use of Ainley Top for reloading of salt.
- Area 10 will plough through the junction into Area 12 and turn at the snow gates.
- Area 12 will plough up to J22 and turn at this junction.
- Both Area 10 & 12 will likely be at Snow Desk for the above and there will be an increased level of communication between both Areas.

- Turning at Scammonden Water Work Unit is an option. This is gated access that must remain closed and locked. The lock code will be made available to winter maintenance personnel.

- For precautionary treatments there is a 300m overlap at J22 by both Area 10 & 12.

These cross boundary mutual aid agreements will have been reconfirmed by BBMM (Area 10) and A-one+ (Area 12).

#### 2.1.2.6 Abandoned vehicle arrangements

Wherever possible the owners of abandoned vehicles will be contacted and requested to remove the vehicles, but where this is not possible, the specific details of the vehicles, its location and the reason why it needs to be moved will be provided to the Police / Traffic Officer / National Vehicle Recovery Manager (NVRM) and a log of all communications kept. The NVRM will provide an end-to-end vehicle recovery service. **BBMM must only move vehicles once an instruction from a Police/Traffic Officer has been received for each vehicle.**

Where owners do leave their information, details will be obtained by BBMM and lodged with the Severe Weather Desk, NTCC and RCC.

Arrangements for the removal and storage of abandoned vehicles will be ordinarily be removed under the direction of, or with the assistance of the HA through its National Vehicle Recovery Manager (NVRM). Additional Guidance is detailed in section 4.2 of the Traffic Officer Service and Service Provider Joint Operating Principles.

#### 2.1.2.7 Incidents involving Winter Service Vehicles

Any incident involving the Highways Agency's own vehicles / any Winter Service Vehicle will be reported to the Service Manager and the National Winter Specialist. The report must be made on form HA 20001 and must be submitted as soon as possible but no later than before 0900 hours the following working day. Where the accident involves a fatality or serious injury the report must be made immediately.

#### 2.1.2.8 Media liaison

In order to facilitate media liaison BBMM must make available to the Service Manager and/or Highways Agency Press Officers such information as requested. Direct liaison with the media must only take place when directed by the Service Manager.

### 2.1.3 Highways Agency's Crisis Management Manual

The Crisis Management Manual (CMM) provides guidance on managing the Highways Agency's response to crises and emergencies. Severe weather events make up a significant proportion of the events that trigger the CMM escalation steps. The five stages of escalation are as follows:

Routine Operations – HA and service provider resources respond to incidents following standard procedures. Weather forecast and warning services would be continuously monitored and if anything shows up escalation would be considered. If service providers become aware of emerging resilience threats they should inform the Agency immediately.

Regional Alert (RA) – when a significant weather event is expected that potentially could cause disruption on the network a regional alert would be declared. Monitoring will be heightened and telephone conferences will take place to ensure we are as prepared as possible prior to the arrival of the forecast weather. Service providers will be required to provide information and to dial into telephone conferences in line with normal expectations. The regional alert process does not change responsibilities within each service type (i.e. service responders will remain fully responsible for managing and delivering their own service), but will act to better coordinate the

individual responses to ensure a more effective combined response as well as to provide the most accurate information to road users.

Regional Crisis – if the SRN is severely affected where sections of the network are closed or road users have become trapped, and are likely to be so for some time or overnight, a Regional Crisis is likely to be declared. The profile of the event is thus raised, a more senior commander will be appointed and the event will be more visible both inside and outside the Agency. During this stage information reporting and the need to dial-in to or attend meetings will be similar to a RA although possibly at an increased frequency but still in line with normal expectations.

National Alert – when more that one region is at Regional Crisis or in advance of a widespread severe weather event the Agency is likely to declare a National Alert. This facilitates coordination across regions as well as providing an accurate national picture of network conditions to inform road users, DfT and maybe Ministers. Service provider activity would be the same as during a Regional Crisis which would still be operating in the region.

National Crisis – this is for the most extreme of events and incidents. As with a National Alert, service provider activity would be the same as during a Regional Crisis.

A key component in the success of any response is accurate and timely information. Service Providers must have appropriate processes to continuously monitor and manage the effectiveness of their severe weather service. During a severe weather event Service Providers must be able to provide real time network performance and service delivery intelligence and information to support the incident coordination process to enable informed appropriate decisions to be made by HA commander.

During a severe weather event conditions may deteriorate to a point where the continuous and safe operation of the network may be placed at risk. The CMM processes will facilitate an early identification of a potential interruption to the network operation with appropriate responses triggered. Any decision to close a route during severe weather should only be made by the identified HA commander at the time.

**Contingency Plan Escalation Procedure**

The Contingency Plan will implemented when the BBMM Standard Incident Response Procedures are unable to contain an incident, to the extent that any of the Multi Agency **Common Incident Objectives** are threatened and the situation is likely to deteriorate further and become out of control without tactical or strategic intervention. The escalation will see the HA Crisis Management Manual (CMM) activated as it adopts the same procedures as the Contingency Plan. When the Severe Weather Alert reaches the Regional Alert Level (2) as specified in the HA CMM Section 3B, the SWO & SWV should contact the HA Emergency Planning Manager (EPM) or Officer (EPO) to review the current Incident Command Level to see whether it needs further escalation. The nature of the Severe Weather Alerts need close monitoring and the CMM escalating further from Regional Alert through to National Crisis.

The Gold Silver Bronze (GSB) Command structure provides a system for escalating incident command to higher levels of command authority when required. Similarly, when these higher authority levels are no longer required the system allows for de-escalation to the most appropriate level of command. In the event of a Severe Weather Desk being in operation, there is a requirement for a Regional Alert to be raised as per the Crisis Management Manual.

BBMM will fully support the CMM escalation process and participate in the conference calls to ensure all relevant information is provided.

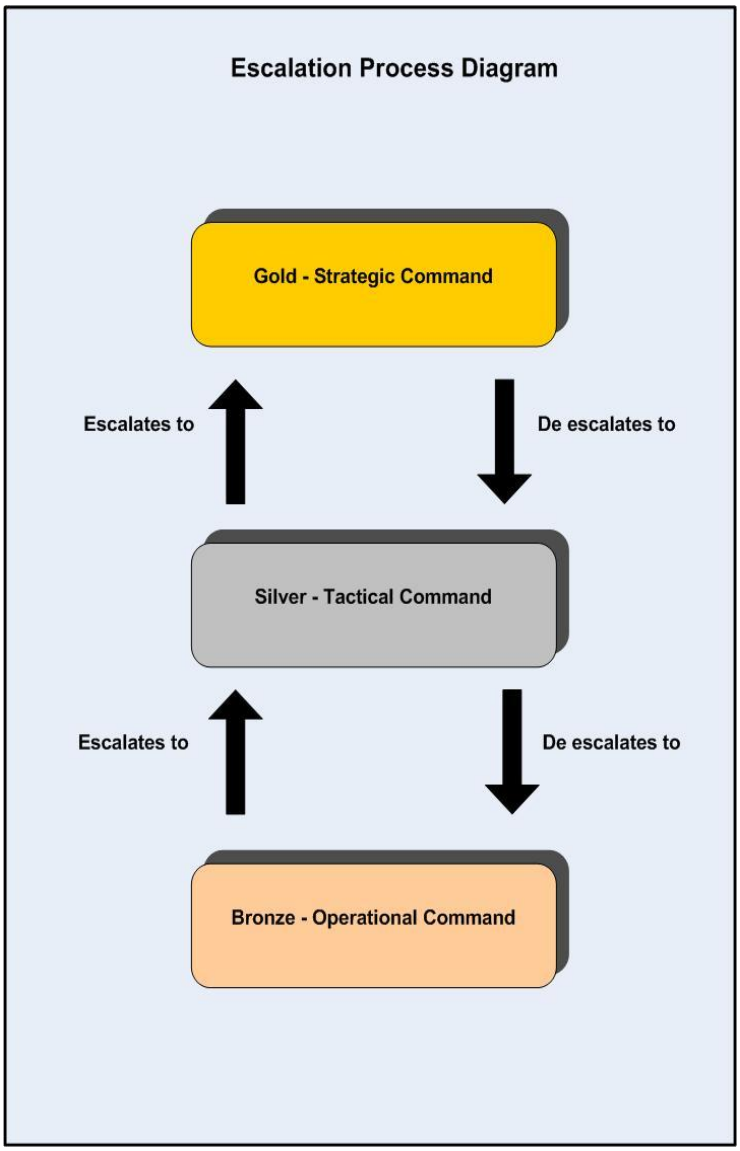
| Command Authority | Escalation Arrangement |
|---|---|
| Bronze | Network Control Centre monitor forecast and actual weather conditions and escalate to the next level if there is a potential threat that could endanger safe passage or cause disruption on the Network, this includes snow, ice, heavy rain, high winds, fog and high temperatures. (Standard Incident Response) |
| Silver | A Severe Weather Desk would be established following communication and escalation from the NCC, this will involve communication with the RCC, Supply Chain Partners, HA Area Team and any relevant stakeholders to ensure that the response meets the HA Objectives and returns the Network to normality. |
| Gold | This would be escalated to this level if this was declared a Major Incident by the Lead Organisation and that the objectives were no longer achievable due to deterioration in events, information would be supplied to the Gold Commander from the Severe Weather Desk (Silver Incident Commander) to allow a strategy for dealing with the incident. |

In broad terms, command should be escalated to the next higher level of command authority (Bronze, to Silver to Gold) when:

- The incident Commander can no longer manage the response with the resources available to them
    - And/or
- They require support/authority to activate additional resources or authorise decisions
    - And/or
- The incident Commander believes that the incident is of such significance that a higher level of command authority is required to manage the response.

Incident Commanders should consider early escalation if they believe that any of the above criteria may be met. It is better to escalate early than to wait so long such that the incident response becomes compromised.

**Escalation Process Diagram**




2.1.3.1 Severe Weather Desk establishment

The Severe Weather Desk must be established prior to the forecasted commencement of Severe Weather that could cause disruption to the Area 10 Network or as soon as possible in the event of un-forecast Severe Weather.

The Severe Weather Desk will be established at the Network Control Centre within the North West Regional Control Centre.

The Severe Weather Desk/control room will have the ability to communicate directly with motoring organisations and local authorities and to listen to/watch local news/traffic media.

The Severe Weather Desk Lead Person will liaise with the TOS Duty Operations Manager (DOM) to agree the frequency and type of contact required between the two persons, to ensure that the TOS DOM is fully aware of all planned actions and decisions being made. This is in addition to the WRF1 reporting requirements in Section 2.2.1.

Where decisions, and their implications, require strategic oversight they will be referred to the Service Manager.

The Severe Weather Desk Duty Rota is included at Appendix A.10.

BBMM will, where appropriate, liaise with neighbouring areas and the Forecast Provider to assess Severe Weather impacts and timing as part of enhanced weather monitoring prior to activation of a formal Severe Weather Desk.

2.1.3.2 Activation of Contingency Plan

This BBMM Area 10 Contingency Plan must be activated when a staff member becomes aware of a major or critical incident taking place and they must immediately put in place the actions outlined within the contingency plan.

Severe weather events will be managed by the SWO and Network Manager & Silver Command Managers, and contingency plan arrangements must only be enacted if the planned response is insufficient to cope with exceptional weather conditions, if procedures fail or if an incident is compounded by a series of further incidents.

The SWO with consultation with the Network Manager & Silver Command Managers will look to escalate and establish a severe weather desk if the resulting forecast looks to threaten the Highways Agency objectives as set out within the BBMM Area 10 Contingency Plan.

The definitions of major and critical incidents are referenced within Appendix C & D, retrospectively, of the BBMM Area 10 Contingency Plan. It must be noted that critical incidents might or could become a major incident

### 2.1.4 Health and Safety

All operations will be undertaken in accordance with BBMM prescribed methods of safe working as detailed in sub-process 4.02 (deliver Severe Weather service), and in accordance with all BBMM Statements and Risk Assessments.

The relevant BBMM Health & Safety Policy also applies for all activities carried out across Area 10.

BBMM sub-processes, method statements and risk assessments can be accessed via the One Place (Integrated Management System).

Risk assessments must be undertaken by Service Providers to ensure the practices expected of operatives and other members of staff on the Network in conditions such as freezing rain are adequately recognised. Completed risk assessments are included within Appendix A.11 for the benefit of others, e.g. Traffic Officer Service.

## 2.2 Reporting

### 2.2.1 Winter Reporting

BBMM will notify the Highways Agency, [redacted] police, adjacent Service Providers, NTCC Embedded Forecaster and local highway authorities of all proposed Winter Service treatments.

BBMM will, as soon as practicable, notify the Highways Agency, [redacted] police, adjacent Service Providers, NTCC Embedded Forecaster and local highway authorities of other actions including changes to proposed treatments.

The Winter Reporting Form (WRF1) system, provided by the Highways Agency, will be used throughout the Operational Winter Period for the above notifications and for confirmation of treatments. The WRF1 system must be kept up to date with plant, salt and fuel resilience to ensure a true and accurate representation of the current situation.

The internet based reporting system is at [redacted] A backup service is available [redacted] In case of failure of the internet based facilities standard forms at Appendix A.12 will be used to fax the reports to the back up fax number [redacted]

All NCC Staff and Verifiers have received training from Atkins and have full access permission for the WRF1 System.

WRF1 reporting will include as a minimum:

- Daily updates by 10:00 hours with salt stock capability, Area Operational Reserve Winter Service Vehicle levels, and fuel status, where there is a possibility of fuel disruption. Additional reports submitted in the event of a change to salt stock capability, status of fuel levels or in the event of an Area Operational Reserve vehicle being used or relocated.
- A “Full” or “No Action” report submitted by 1600 hours each day which details the proposed actions to be undertaken in the following 24 hour period. However, where a decision was made after 1600 hours or a previous decision was changed, the appropriate report must be submitted within 30 minutes of a decision, and no later than the proposed start time of the treatment.
- A “Previous Action” report to confirm all the actions undertaken since the submission of the last “Full” or “No Action” report. This daily report(s) must be submitted by 1000 hours on the following day, but, where possible, submitted within 30 minutes of the treatment being completed.
- An hourly update, when Severe Weather Desk is in operation.

BBMM will monitor salt stocks (and stocks of other appropriate materials) regularly during the Operational Winter Period and report using the WRF1 electronic reporting system.

### 2.2.2 Severe Weather reporting

BBMM will notify the Highways Agency, [redacted] police, adjacent Service Providers, NTCC Embedded Forecaster and local highway authorities of all proposed actions.

Where a Severe Weather Event is forecast BBMM will liaise with the Police and Traffic Officer Service and decide upon the need for a ‘Severe Weather Desk’ if it is decided that one is required it will be established as prescribed in previous paragraphs. The Highways Agency and other relevant parties will be notified of the decision along with the time of activation and location of the desk, reports to the HA will be provided on an hourly basis until either the cessation of the event or it has reduced in severity to the extent that it is no longer problematical to the general travelling public.

BBMM will report the number of Severe Weather events that required treatment/actions within the Area 10 Network.

### 2.2.3 Additional reporting

BBMM will submit details of all non warranty defects and maintenance for the Highways Agency’s winter fleet vehicles for the previous calendar month by the 15th of each month. Submissions will be made using the spreadsheet available from the National Winter & Severe Weather Team.

BBMM will submit vehicle off road (VOR) figures on defect reports for all HA owned winter fleets, to the National Winter & Severe Weather Team. Template spreadsheets are available from the National Winter & Severe Weather Team.

BBMM will submit an Operational Assessment Report as stipulated in the Service Timetable in Section 1.1.2.

A comprehensive external contact list can be found in Appendix A.8.

Reports will be used for hot and cold de-briefs, as part of developing new research programmes, or identifying areas for review, as part of the lessons learnt process, therefore it is essential that the information is complete and accurate.

### 2.3 Records

Collection of good quality records covering decisions made together with reasons, and advice and information provided is fundamental especially to defend against liability claims made in respect of Winter Service and any actions taken in the case of Severe Weather.

The table below demonstrates the detailed record information that BBMM must retain:

| Information | Record Content | Format | Storage Media | Retention Period |
|---|---|---|---|---|
| Weather Forecast | 24 Hr Forecast<br><br>2-5 Day Forecast<br><br>Morning Summary | Electronic | CD & Backup Tape | 6 yrs after Contract End |
| Actual Weather Conditions | [redacted] | Electronic | CD & Backup Tape | 6 yrs after Contract End |
| Reports Received | Police<br><br>Traffic Officer Service<br><br>General Public<br><br>Media | Electronic | CD & Backup Tape | 6yrs after end Contract |
| Decisions Made | Notification Sheet | Electronic | CD & Backup Tape | 6yrs after end contract |
| Instructions Given | SWO Log Sheets | Electronic | CD & Backup tape | 6 yrs after end contract |
| Confirmations | SWO Duty Log Sheet | Electronic | CD & Backup tape | 6 yrs after end contract |

| | | | | |
|---|---|---|---|---|
| Actions taken | SWO Duty Log Sheet | Electronic | CD & Backup tape | 6 yrs after end contract |
| Liaison & Communication Log | WMO sheet<br><br>Duty Supervisor Log Sheet | Electronic | CD & Backup Tape | 6yrs after end Contract |
| Telephone conversations including with forecast provider | SWO Log Sheet | Electronic | CD & Backup Tape | 6 yrs after end Contract |
| Material Usage | WRF1 Report | Electronic | World Wide Web Database | 6 yrs after end Contract |
| Fleet Breakdown | Fleet Manager Weekly report | Electronic | CD & Backup Tape | 6 yrs after end Contract |
| Times to Complete Treatment Runs | Operational Report | Electronic | CD & Backup Tape | Initially 3 months. indefinite archiving thereafter |
| Use of additional resources (including reserve fleet and mutual aid) | Use Additional Fleet & Mutual Aid | Electronic | World Wide Web Database | WRF1 Report |
| Road Closures/blockages due to weather conditions | WRF1 & CONFIRM Log | Electronic | CD & Backup Tape | 6 yrs after end Contract |
| Complaints received relating to conditions due to weather | HAIL, BBMM Customer Enquiries and Network Control Centre | Electronic | CD & Backup Tape | 6 yrs after end Contract |
| End of season records including accuracy of weather information, lessons learnt and Severe Weather Action Plan | Report | Electronic | CD & Backup Tape | 6 yrs after end Contract |

## 2.4 Review

| :Review Format | Frequency | Details |
|---|---|---|
| Action Plan Review | Daily | NM reviews the decision to ensure correct action taken. Reviews 2 to 5 day Forecast to determine requirements for plant, labour and materials. |
| Fleet Reports | Weekly | Plant Manager (PM) provides report to NM. Identify any actions and issues. |
| Performance Management Framework Scoring | Monthly | NM reviews and scores Aspects & sub processes relative to the delivery of the various elements of winter service |
| Network Performance Meeting & Report | Monthly | Provide report to determine compliance with contract and timeliness of treatment. NM to identify any operational issues such as health and safety, communication, fleet, operatives and materials. |
| Winter Operational Meeting | Monthly | NM meeting with HA Regional Winter Service manager Steve Lewis to discuss and review winter maintenance issues (fleet/operations/depots). Also Area Performance Team and Traffic Officer Service are invited to the meeting to discuss relevant operations on Network. |
| Mid Season Review | Yearly | Review Area 10 procedures for decision making, treatments, weather bureau service, and [redacted] forecasting service. Schedule on lead-up to Christmas and New Year period to allow time to identify any improvements or resource issues. |
| [redacted] End of Season Review | Yearly | [redacted] presents season performance figures and obtains feedback from NM. |
| Weather Bureau End of Season Review | Yearly | Weather bureau service presents performance and figures. NM presents feedback on season. |
| Operational Assessment Report Review | Yearly | Review of Area 10 procedures from decision making to treatment to snow desk (if activated), fleet, operatives and materials. Incorporate findings from review to identify improvements for next season Creation of Operational Review. |

## 2.5 Weather information

The Highways Agency Weather Information Service (HAWIS) has been developed to provide weather forecasts, the continuous monitoring of actual conditions year round to facilitate winter service operations and support the resilient management of the network during severe weather events. HAWIS obtains environmental weather condition data from meteorological Environmental

Sensor Stations (ESS) located on the Network. The service is procured by the Highways Agency through the following contracts:

- Highways Agency Weather Central Service (HAWCS)
- Environmental Sensor Station Supply Framework (ESS Supply)
- Environmental Sensor Station Maintenance and Installation (TechMAC / Regional Technology Maintenance Contractor (RTMC))
- Environmental Sensor Station Communication (NRTS)
- National Weather Forecasts (National Forecast Provider)
- Service Provider Weather Forecasts (MAC/ASC)

The HAWIS website can be accessed at [redacted]

BBMM has appointed Met Office to provide the forecast requirement detailed in Appendix B.2.

Met Office Hazard Manager is used to monitor and assess Severe Weather Alerts and subsequent flooding issues raised by the Flood Forecasting Centre.

NILO alerts and alerts from adjacent areas are also used for early warnings.

Faults on HAWIS must be reported as soon as possible to the appropriate maintenance contractor. Contact details can be found in Appendix A.8.

### 2.5.1 National Domain Network of Environmental Sensor Stations

The domain map is shown in Appendix A3.

4 no. additional ESS were installed on the Network in 2012 – M60A J10 Barton (to replace a previously poorly sited ESS), M60A/M62 E/B J18 Simister (to provide additional information on a specific microclimate), M60B J15 Wardley (to provide extra Network coverage) and M65 E/B J6 Blackburn (to provide extra Network coverage).

M6 Hassall Green ESS has a long term fault on it, so M6 Little Madeley is being used instead.

#### 2.5.1.1 Domain arrangements

Domain arrangements are described in the following table and detailed on the Area Map in Appendix A.3.

| Domain | Outstations | Routes |
|---|---|---|
| 1 (Central) | M57 Huyton /M62 Burtonwood<br>M6 Little Madeley<br>M56 Hatton<br>A550 Shotwick Lodge<br>A550 Shotwick Lodge / M53 Wallasey<br>M56 Nags Head<br>M60 Barton | [redacted] |
| 2 (Urban) | M67 Hyde / M60 Barton<br>M56 Nags Head / M60 Barton | [redacted] |
| 3 (North) | M6 Samlesbury/M61 Chorley<br>M6 Gathurst<br>M61 Chorley / M60 Barton<br>M6 Gathurst<br>M58 Royal Oak | [redacted] |
| 4 (Semi High) | M67 Hyde<br>M6 Samlesbury/A56 Accrington<br>M60 Barton / M62 Milnrow | [redacted] |
| 5 (High) | M62 Windy Hill<br>A56 Accrington | [redacted] |

# 3 RESOURCES

This section of the Severe Weather Plan contains details of the resources available for delivery of a Severe Weather Service on the Area 10 Network including reserve / contingency arrangements.

The Highways Agency will make available compounds, vehicles, plant and equipment as appropriate to the form of contractual arrangement and may make available additional reserve resources if the Service Provider requires them due to breakdowns or operational difficulties.

BBMM is responsible for providing the other resources including staff, materials, and brine production equipment and storage.

BBMM is responsible for preparing and ensuring that all compounds, equipment and plant operate efficiently.

BBMM will operate from Milnrow, Preston Brook and Westhoughton Depots (including Hale for Electrical operations) on a day to day basis. These Depots along with Brinnington, Clatterbridge, Charnock Richard, Knutsford, Newton-le-Willows, Tarbock and Whitebirk Depots will be used for winter service activities. Glenburn and Sandbach Depots will only be used to access HA Strategic Salt, if required, upon agreement.

## 3.1 Human resources

### 3.1.1 Key personnel

The following table identifies the key personnel responsible for delivery of the services defined within this document.

| Function | Title | Name |
|---|---|---|
| Severe Weather Verifier (SWV) | AMOR Service Manager (Overall Responsibility) | [redacted] |
| Severe Weather Verifier (SWV) | Network Manager (Day to day Responsibility) | [redacted] |
| Severe Weather Verifier (SWV) | Programme Delivery Manager | [redacted] |
| Severe Weather Verifier (SWV) | Maintenance Manager Central | [redacted] |
| Severe Weather Verifier (SWV) | Maintenance Manager North | [redacted] |
| Severe Weather Verifier (SWV) | Maintenance Manager South | [redacted] |
| Severe Weather Verifier (SWV) | Programme Delivery | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| SWO | Severe Weather Officer | [redacted] |
| Delivery of on road treatments by Highway Maintenance Operatives | Maintenance Manager South | [redacted] |
| Delivery of on road treatments by Highway Maintenance Operatives | Maintenance Manager Central | [redacted] |
| Delivery of on road treatments by Highway Maintenance Operatives | Maintenance Manager North | [redacted] |
| Winter Fleet | Plant Co-ordinator | [redacted] |
| HA Premises | Office & Premises Manager | [redacted] |
| | | |
| | | |
| | | |
| | | |
| | | |

### 3.1.1.1 Organogram

### 3.1.2 Staffing levels

BBMM has [redacted] qualified drivers for Winter Service operations on the Area 10 Network, which will meet the Highways Agency's AMOR requirement to provide an effective Winter Service. This is equates to a minimum resource level of three times the number of Operational Winter Service Vehicles [redacted] There are [redacted] Operatives in total. It is BBMM intention to train [redacted]. Operatives up so they can deliver Winter Service, giving a greater level of resilience.

During the winter period 1st October to 30th April BBMM will prioritise and detail staff that are trained in 'Winter Service' provision to those duties to ensure that all necessary treatments are undertaken ensuring that the network is treated in accordance with this Severe Weather Plan.

During other Severe Weather Events the appropriate level of resource from BBMM and Supply Chain will be identified and placed on alert allowing for a robust response to any Severe Weather Event.

Operatives are to be listed at Appendix A.13.

#### 3.1.2.1 Training

All BBMM staff in the delivery of winter maintenance has received the relevant training to deliver a high standard of winter service across Area 10.

This is detailed as below;

Winter Maintenance Operatives

- City & Guilds 6159: Winter Service Operations Qualification
- Unit 03, 04 & 07

  Winter Maintenance Decision makers and Verifiers
- Meteorology Training
- Vaisala Training
- Severe Weather Desk

Training Records are detailed at Appendix A.14.

## 3.2 Compounds and facilities

An inventory relating to BBMM's compounds and the Area Operational Winter Service Vehicles (including Operational Reserve) plus National Reserve Winter Service Vehicles is stored on an MS Access database held by the Highways Agency. This inventory requires periodic updates to reflect any changes.

BBMM will review and update the MS Access database inventory at intervals set out in the Service Timetable in Section 1.1.2.

### 3.2.1 Compounds

Details of compounds, depots and other facilities covering the Area 10 Network are provided in the compounds, depots and facilities schedule at Appendix A.15.

### 3.2.2 Fuel

The fuel type (including grade) and details of supply and storage arrangements including minimum stock levels and supply contingency and pump maintenance arrangements are detailed at Appendix A.16.

BBMM will monitor fuel stock levels regularly during the Operational Winter Period and report using the WRF1 system as per requirements in Section 2.2.

### 3.3 Treatment materials

Contextual guidance on treatment materials including storage are contained in Appendix B.3.

BBMM will utilise the following de-icing/anti-icing materials to deliver an effective Winter Service on the Area 10 Network.

- 6mm down salt to BS3247: 2011, this salt is extracted and crushed at a dedicated mine in Winsford, Cheshire. Containing a small quantity of anti-caking additive to maintain spreading properties after prolonged storage.
- brine solution with an optimum and maximum Sodium Chloride concentration of 23% and no less than 20% - this is manufactured using brine saturator plants, this is then applied to 6mm dry salt during spreading increasing the moisture content and quickening the melting process.
- 3-6mm 99% pure white rock salt – this added to water and the by-product of this is brine
- 10mm 99% pure rock salt – this acts in the same way as 6mm salt (only a small amount is stored in Area 10 and will only be used in the event of any salt shortages).
- Magnesium Chloride/ Calcium Chloride – may be considered for isolated areas.
- BBMM note that the National Winter Service Research Group (NWSRG) has developed “Treatments for Extreme Cold” in their Practical Guide for Winter Service

#### 3.3.1 Material storage and brine production

All operational Winter Maintenance depots have purpose built salt storage barns. The storage of both white and brown salt is contained within each operational depot. Both white and brown salt will be delivered in bulk with the use of tipping vehicles.

Planning is underway to replace & relocate Knutsford Salt Barn.

There is an additional 2, 200t of HA strategic salt (brown salt) stockpiled within Glenburn and Sandbach depots should further salt shortages occur again, any use of this would be subject to Service Delivery Manager approval.

Depot facilities are listed in Appendix 15.

| Material: Rock Salt (BBMM) | | | |
|---|---|---|---|
| Location | Type | Capacity (tonnes or litres) | Min (tonnes or litres) |
| Brinnington | Barn | 1,885 | 1,145 |
| Clatterbridge | Dome | 1,800 | 923 |
| Charnock Richard | Barn | 1,430 | 1,181 |
| Hale | Barn | 2,027 | 1,053 |
| Knutsford | Barn | 2,192 | 1,250 |
| Milnrow | Barn | 3,889 | 1,495 |
| Newton le Willows | Barn | 1,957 | 820 |
| Preston Brook | Barn | 2,212 | 1,320 |
| Tarbock | Dome | 3,150 | 1,191 |
| Westhoughton | Barn | 3,857 | 1,130 |
| Whitebirk | Barn | 1,947 | 1,050 |
| | | | |

| Material: Rock Salt (HA Strategic Stock) – 10mm Thawrox Rock Salt | | | |
|---|---|---|---|
| Location | Type | Max (tonnes) | Min (tonnes) |
| Glenburn | Barn | 1000 | N/A |
| Sandbach | Barn | 1200 | N/A |

| Material: Brine Manufacturing – 3-6mm Pure White Rock Salt | | | |
|---|---|---|---|
| Location | Type | Max (tonnes) | Min (tonnes) |
| Brinnington | Barn | 150 | 75 |
| Charnock Richard | Barn | N/A | N/A |
| Clatterbridge | Dome | 150 | 75 |
| Hale | Barn | 150 | 75 |
| Knutsford | Barn | N/A | N/A |
| Milnrow | Barn | 150 | 75 |
| Preston Brook | Barn | 150 | 75 |
| Newton le Willows | Barn | 150 | 75 |
| Tarbock | Dome | 150 | 75 |
| Westhoughton | Barn | 150 | 75 |
| Whitebirk | Barn | 150 | 75 |

| Material: Brine Production and storage | | | |
|---|---|---|---|
| Location | Type of Saturator | Max (litres) | Min (litres) |
| Brinnington | Peacock multisol VA pro | 15,000 | 5,400 |
| Charnock Richard | Natural Salt 208 twin | 20,000 | 10,400 |
| Clatterbridge | Peacock multisol VA pro | 10,000 | 3,600 |
| Hale | Peacock multisol VA pro | 15,000 | 5,400 |
| Knutsford | Natural Salt 208 twin | 20,000 | 10,400 |
| Milnrow | Peacock multisol VA pro | 15,000 | 2,200 |
| Preston Brook | Peacock multisol VA pro | 15,000 | 2,200 |
| Newton le Willows | Peacock multisol VA pro | 15,000 | 5,400 |
| Tarbock | Peacock multisol VA pro | 15,000 | 5,400 |
| Westhoughton | Peacock multisol VA pro | 15,000 | 5,400 |
| Whitebirk | Peacock multisol VA pro | 15,000 | 5,400 |

All salt is stored in dedicated salt stores reducing the risk of any cross contamination.

Currently BBMM have no salt bins or salt heaps located on the Area 10 Network.

### 3.3.2 Supply arrangements

Primary supply of rock salt in Area 10 will be provided by [redacted]

Secondary supplier of rock salt in Area 10 will be provided by [redacted]

The table in Appendix A.21 shows the, i.e. the level at which re-ordering takes place. In normal circumstances this will have been anticipated by BBMM and orders placed to bring stocks back over the Reporting Threshold levels.

If the level of stock falls below the Reporting Threshold and [redacted] are not able to supply due to unforeseen events and/or outside influences, then we will use our secondary supply to ensure we do not fall below our minimum Suggested Operating Levels (formerly Minimum Capabilities)

This has been implemented to give BBMM resilience should we experience a prolonged cold spell. This extra resilience will be used to ensure we do not fall below the minimum Suggested Operating Levels (formerly Minimum Capabilities) in the event that prioritisation of orders and deliveries to BBMM is curtailed by outside influences.

BBMM will use the Re-stocking plan template in Appendix A.21 to document all salt supply arrangements.

### 3.3.3 Reserve / contingency arrangements

Please refer to Section 3.3.2 and Appendix A9.

The Re-stocking plan template is shown in Appendix A.21 to document all reserve/contingency salt supply arrangements. **This needs to be submitted by 31st May 2013.**

### 3.4 Vehicles and plant

BBMM has in total [redacted] Area Operational Winter Service Vehicles (including Operational Reserve Vehicles) available for use of which [redacted] have been allocated as Operational Winter Service Vehicles to cover the planned precautionary Winter Service Routes [redacted]. The remaining vehicles are designated as Operational Reserve Vehicles detailed in Section 3.4.1.

In addition to the Area Operational Winter Service Vehicles, a further [redacted] vehicles, which form part of the complement of Winter Service Vehicles within the Area are designated as National Reserve Vehicles. Special conditions, as set out in Appendix B.4, attach to their usage.

[redacted] in number (see table in Appendix B.4), are additional to the Area Operational Winter Service Vehicles. BBMM shall adopt the procedures for Operational Reserve Vehicles in relation to their use.

There are [redacted] precautionary treatment routes, with an additional [redacted] Extra Effort routes. For an area wide snow event all [redacted] Winter Service Vehicles could be deployed.

Brine production plants have been installed at all operational winter maintenance depots. There are [redacted] units across Area 10, [redacted]. of which have been manufactured and supplied by [redacted] Maintenance of the Peacock units can be conducted by either [redacted] Supply Chain. [redacted] saturators are limited to using only 98% + pure white salt.

Due to the lack of storage capacity for white salt at [redacted] depots [redacted] Brine tanks have been installed. [redacted] saturators are capable of producing brine solution with the use of standard brown rock salt. Therefore this removes the need for the storage of white salt.

Weekly salinity checks will be carried out on each brine production unit.

Bulk salt loading facilities within Area 10 network exist at the following depots: -

- [redacted], located on the M6. The facility is a shelf type hopper. The Salt barn is due to be replaced and repositioned, so the hopper will eventually be removed. Works are due o commence January 2014.
- [redacted], located on the M60. The facility is a conveyor type hopper.
- [redacted] on the M62. The facility is a conveyor type hopper.

Load tests will be undertaken every 2 years with settlement levels taken.

Electrical testing will be undertaken every 2 years

During severe weather conditions certain lengths of footways and cycle tracks will be treated with de-icing materials and have snow accumulations removed.

Priority will always be given to the treatment and clearance of the motorway and the all purpose trunk road network. When resources become available snow removal on footways and cycle ways will commence and endeavours will be made to complete clearance with the timescales specified in Section 5.1.7.

The schedules of vehicles, plant and equipment are provided in Appendix A.17.

### 3.4.1 Area Operational Reserve Winter Service Vehicle and contingency arrangements

BBMM can use the Area Operational Reserve Winter Service Vehicles allocated to their Network without prior approval but must ensure the use is notified up to an agreed predetermined level. National procedures for management of the both Area Operational Reserve Winter Service Vehicles and National Reserve Vehicles are in Appendix B.4.

BBMM will utilise Supply Chain Partner low loaders for transport of the snow blowers. Should it be necessary to loan a HA spreader to another area then BBMM (Area 10) will supply a driver and facilitate delivery to the designated depot.

The number of Area Operational Reserve Winter Service Vehicles and the agreed Reserve Threshold trigger level is provided in the table below.

| Reserve Vehicles | Area 10 |
|---|---|
| Number of Area Operational Reserve Vehicles | [redacted] |
| Reserve Threshold – Number utilised | [redacted] |

### 3.4.2 Vehicle maintenance arrangements

BBMM will maintain vehicles in accordance with ASC Service Information Annex 7.

All Employers vehicles are maintained by [redacted] Supply Chain Partner) in accordance with ASC Service Information Annex 7.

All plant and equipment will be checked and be in a state of readiness by 23rd September each year. Notification that the fleet is prepared will be by a report from the Plant & Fleet Co-ordinator to NM before 30th September each year.

The NM will write to the Service Manager confirming that the Employers Vehicles are in a state of readiness for the start of the winter period on October 1st.

Copies of routine servicing records as well as the schedule of operator information shall be held by the Plant Manger located at [redacted] Office.

BBMM will ensure that washing of vehicles and plant to remove all traces of salt shall be carried out on the first working day following a salting run, as stated in ASC Service Information Annex 7.

HA and BBMM fleet will be 'run' and washed on a fortnightly basis.

Details of key staff involved in vehicle maintenance can be found in Appendix A.7 and Appendix A.8.

Day to day defects are reported by a paper trail direct to the Plant & Fleet Co-ordinator who will then make the necessary arrangements for repair, this will be done in compliance with [7.10] Manage Facilities Sub Process held on the One Place.

BBMM will rotate use of all Area Operational and Reserve Winter Service Vehicles to balance usage of Area Operational Winter Service Vehicles (including Operational Reserves). [redacted] were rotated prior to the start of the 2013-14 winter season.

#### 3.4.2.1 Vehicle breakdown and recovery arrangements

BBMM will provide 24 hour contingency arrangements to deal with any vehicle or plant breakdown including replacement of immobilised vehicles using HA or BBMM provided dedicated reserve plant located in compounds within Area 10.

[redacted] are our supply chain partner who will undertake recovery of our fleet in case of a breakdown that cannot be repaired on site. Their contact number is shown in Appendix A.8.

3.4.2.2 Vehicle preparation

BBMM will ensure by the end of September that the HA winter fleet / ploughs have all undergone the necessary service requirements and additionally have the relevant certification regarding:-

- Tachometer
- Brakes
- Spread rate calibration
- Weigh cell calibration

This information will be provided by the Plant Manager to the NM who will in turn inform the Service Manager of the Area 10 operational readiness.

### 3.4.3 Arrangements with supply chain partners

Refer to 'One Place' for details of the Area 10 Supply Chain Register and Appendix A.8 for external contacts

# 4 WINTER SERVICE ROUTE PLANNING

This section of the Severe Weather Plan contains details on BBMM's Winter Service Routes (WSR) for use in the delivery of Winter Service on the Area 10 Network.

Route optimisation was carried out during the summer 2013. Under the guidance in AMOR, the routes were reduced from [redacted] Precautionary Treatment Routes.

BBMM will plan, design and continually review the WSR to ensure they are optimised to be as efficient as possible in terms of treatment lengths and time to undertake treatment.

An effective Winter Service can respond to a change in the forecast in a timely manner. For this reason the initial response is defined as the maximum permitted time taken from the decision to treat until the Winter Service Vehicles are loaded, staffed and ready to leave the depot.

Initial response time is [redacted]

Precautionary treatment is most effective when carried in out advance of and as close to forecast freezing time (to minimise the loss of salt due to trafficking). Therefore, the precautionary treatment and turnaround time is defined as the maximum permitted time for the following cycle: leaving the depot, treating the route, returning to a depot and being ready to leave the depot for the next treatment.

AMOR Precautionary Treatment and Turnaround time is [redacted] a nominal [redacted] minutes has been used for the Turnaround. No Route treatment exceeds [redacted] For the Purpose of PMF 5.3b, All Routes are to be completed within [redacted]

## 4.1 Winter Service Route design

BBMM will liaise closely with adjacent Highway Authorities and other stakeholders when designing WSR for precautionary and reactive treatment to ensure consistency and continuity of Winter Service operations on all sections of the Network and with adjacent highway networks, including footways and cycle tracks.

[redacted]

BBMM will take into consideration the impact from the following, where applicable, when designing the WSR (not exhaustive):

- Physical constraints such as tunnels, over bridges, operations near railways, solid vertical barriers, geometry and traffic calming areas;
- Potential need for different requirements on different lanes of the carriageway;
- Need for variation in anti-icing/de-icing material, application frequency, spread rates, spread patterns, free running and wastage factors;
- Major schemes;
- Route classification;
- Managed Motorways with hard shoulder running;
- Network Features;
- Vulnerable locations;
- Depot constraints
- Depot access problems due to localised congestion caused by severe weather;
- Variation in traffic flow;
- Poor weather conditions; and
- Carrying snowplough blades on precautionary treatment runs.

The following [redacted] so they should always be accessible even if there is localised congestion. Operational Reserve & National Reserve Gritters are strategically located throughout the depots – see Appendix 17. If for any reason access/egress is totally prevented from one depot, then the routes operate from that depot will be carried out from the closest operational depot(s) to it. The same principles will be applied for any vehicle breakdown, that put a vehicle off road i.e. use a spare vehicle from that depot or get a spare vehicle from a nearby depot, whilst noting the requirements shown in Appendix B4.

### 4.1.1 Precautionary treatment routes

BBMM has designed WSR for planned precautionary treatments to meet the precautionary treatment requirement (detailed in the following table). The target treatment time for each route and turnaround time is stated on the route schedule and drawing (Appendix A.18). For PMF 5.3b, All Routes will be treated [redacted]

There are currently no Managed Motorways in Area 10.

| **Precautionary treatment requirement** | | | |
|---|---|---|---|
| Route classification | Red | Amber | Green |
| Criteria | All lanes (including slip roads) to be kept clear of ice, as far as reasonably practicable | | |

New Guidance has been received from the HA on Latest Return Times (LRT) to Depot to ensure that there is sufficient time to refill the Brine & Salt and carry out the Wash & Checks within the maximum [redacted] permitted under AMOR for Treatment and Turnaround.

The LRTs depend on the number of Routes treated by a Depot.

| Depots with 2 Routes | Brine | Salt | Wash / Checks | Applicable Routes | | | |
|---|---|---|---|---|---|---|---|
| [redacted] | | | | | | | |
| [redacted] | | | | | | | |

All Routes Return prior to LRT

| Depots with 3 Routes | Brine | Salt | Wash / Checks | Applicable Routes | | | | |
|---|---|---|---|---|---|---|---|---|
| [redacted] | | | | | | | | |
| [redacted] | | | | | | | | |
| [redacted] | | | | | | | | |

All Routes Return prior to LRT

| Depots with 4 Routes | Brine | Salt | Wash / Checks | Applicable Routes |
|---|---|---|---|---|
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |

All Routes Return prior to LRT

| Depots with 5 Routes | Brine | Salt | Wash / Checks | Applicable Routes |
|---|---|---|---|---|
| R1 – Latest Return Time 2:05hrs | [redacted] | [redacted] | [redacted] | [redacted] |
| R2 – Latest Return Time 2:15hrs | [redacted] | [redacted] | [redacted] | [redacted] |
| R3 – Latest Return Time 2:25hrs | [redacted] | [redacted] | [redacted] | [redacted] |
| R4 – Latest Return Time 2:30hrs | [redacted] | [redacted] | [redacted] | [redacted] |
| R5 – Latest return Time 2:40hrs | [redacted] | [redacted] | [redacted] | [redacted] |

[redacted]

LRT Times are also shown in Appendix 18.

### 4.1.2 Snow clearance routes

Snow clearance can take longer than precautionary treatment, therefore snow routes have been designed to achieve the clearance requirement detailed in the following table and mitigate excessive driver hours. The snow clearance plan should be coordinated with the RCC and care taken to ensure consistency across boundaries between Service Providers.

[redacted]

| [redacted] | | | | | | |
|---|---|---|---|---|---|---|
| [redacted] | [redacted] | | [redacted] | | [redacted] | | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | | | | | | |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | | [redacted] | | [redacted] | | [redacted] |

### 4.2 Winter Service Route summary

Summary of WSR for carriageways, footways, cycle tracks and other such areas used by pedestrians and cyclists is provided in the following table.

[redacted]

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| Route Id | Route type | Treatment type | Length | [redacted] |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| Route Id | Route type | Treatment type | Length | [redacted] |
| [redacted] | | | | |
| [redacted] | | | | |
| [redacted] | | | | |

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| Route Id | Route type | Treatment type | Length | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| Route Id | Route type | Treatment type | Length | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| Route Id | Route type | Treatment type | Length | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| Winter Service Route Summary [redacted] | | | | |
|---|---|---|---|---|
| **Route Id** | **Route type** | **Treatment type** | **Length** | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

[redacted] A20 VL 02 A20 VL 03 A20 VL 25 [redacted] A20 VL 01 A20 VL 12 [redacted] Appendix 20

| Winter Service Footways | | | |
|---|---|---|---|
| Category | From | To | Route Description |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |

| Treatment requirements are summarised below for the different categories | | | | |
|---|---|---|---|---|
| Category | Overnight Frost conditions. Overnight forecast temperatures below zero but **not** extending beyond 8am | Daytime Frost conditions. Overnight forecast temperatures below zero extending beyond 8am | Extended Frost Conditions Forecast temperatures remaining below zero throughout daylight | Snow Events |
| 2 | No Treatment | Reactive treatment (by 8am of that day) | Monitor and further treatment as required | Snow removal will begin when resources come available from carriageway treatments. Endeavours will be made to complete clearance within 48 hours of cessation of snowfall, subject to availability of resources. |
| 3 | No Treatment | No Treatment | Reactive treatment (by noon of the first day) | Snow removal will begin when resources come available from carriageway treatments. Endeavours will be made to complete clearance within 5 days of cessation of snowfall, subject to availability of resources |

The detailed schedules for each WSR including drawings are provided in Appendix A.18.

# 5 ACTIONS FOR WEATHER CONDITIONS

This section of the Severe Weather Plan contains decision and treatment matrices and BBMM's detailed operational procedures for Winter Service and alert procedures and actions in the event of other Severe Weather on the Area 10 Network.

Decision makers and verifiers are BBMM staff that have a vast amount of experience in this field and have a good understanding of the Area 10 Network along with the problems it presents. This in conjunction with the route based forecasting will only add to the accuracy of proposed treatment and subsequent actions.

## 5.1 Winter decision and treatment matrices

Decisions are made in the interest of service delivery and continuity, and takes account of weather conditions informed by the HAWIS and decision information, where applicable, from adjacent Service Providers and relevant Local Highway Authorities.

All decisions will be subject to continuous monitoring, recording and review.

All Winter Service decisions are evidence based and will be made in accordance with the guidance contained within the following decision and treatment matrices:

All Winter Service decisions are evidence based and will be made in accordance with the guidance contained within the following decision and treatment matrices:

BBMM will again adopt the decision/treatment matrices in their entirety as shown in Section 5.1.1 including the point at when the ploughs should be fitted within the table at Section 5.1.3.

Guidance on repeat treatments for RSTs expected to fall below 1 °C is noted and is shown in Section 5.1.2.

Guidance given in Section 5.1.4 for precautionary treatment during extreme cold conditions, in Section 5.1.5 for treatments prior to snow/freezing rain during extreme cold conditions and in Section 5.1.6 for treatment to compacted snow or ice during extreme cold conditions is again noted.

Tables Section 5.1.4 and Section 5.1.5 are for use as precautionary treatments only when the road surface temperature (RST) at the time of spreading is at or below -7 °C (or -5 °C in low humidity conditions). BBMM will need to consider alternative treatment materials for use when spreading at these very low temperatures.

When carrying out treatments when the RST at the time of spreading is above -7 °C (or -5 °C in low humidity conditions), Table Section 5.1.3 should be used as normal, even when forecast temperatures are due to fall below this level.

It is noted that for spread rates greater than 20g/m2 shown in Tables Section 5.1.4 and Section 5.1.5, more than one treatment may be required, utilising one or more vehicles.

Table Section 5.1.6 is a reactive treatment for treating compacted snow / ice when the lower of the RST or air temperature is at or below -7 °C (or -5 °C in low humidity conditions).

Pre-wetted treatments will be the normal treatments, in accordance with the guidance.

During periods of forecast severe weather BBMM must remain in contact with [redacted] and should also take account of information from staff out on the Network Traffic Officer Service and CCTV when making decisions.

### 5.1.1 Decision Matrix

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Road Surface Temperature</th><th>Precipitation etc.</th><th>Wet</th><th>Wet Patches</th><th>Dry</th></tr>
<tr><td rowspan="2">May fall below 1°C</td><td>No rain<br>No hoar frost<br>No fog</td><td rowspan="3">Salt before frost</td><td rowspan="2">Salt before frost<br>(see note 1)</td><td rowspan="2">No action likely, monitor weather<br>(see note 1)</td></tr>
<tr><td rowspan="5">Expected to fall below 1°C<br>(see note D)</td><td>No rain<br>No hoar frost<br>No fog</td></tr>
<tr><td>Expected hoar frost<br>Expected fog</td><td colspan="2">Salt before frost<br>(see note 2)</td></tr>
<tr><td>Expected rain BEFORE freezing</td><td colspan="3">Salt after rain stops</td></tr>
<tr><td>Expected rain DURING freezing</td><td colspan="3">Salt before frost and after rain stops<br>(see note 3)</td></tr>
<tr><td>Possible rain<br>Possible hoar frost<br>Possible fog</td><td colspan="2">Salt before frost</td><td>Monitor weather conditions</td></tr>
<tr><td colspan="2">Expected snow</td><td colspan="3">Salt before snow fall (see note 4)</td></tr>
<tr><td rowspan="3">Freezing Rain</td><td>Before rain</td><td colspan="3">Salt before rainfall (see notes 3 and 4)</td></tr>
<tr><td>During rain</td><td colspan="3">Salt during rainfall (see notes 3 and 4)</td></tr>
<tr><td>After rain</td><td colspan="3">Salt after rainfall (see notes 3 and 4)</td></tr>
<tr><td colspan="5">The decision to undertake precautionary treatments should, if appropriate, be adjusted to take account of residual salt or surface moisture.</td></tr>
<tr><td colspan="5">Notes:<br>1) Particular attention should be given to any possibility of water running across carriageways and such locations should be monitored and treated as required.<br>2) When a weather warning contains reference to expected hoarfrost considerable deposits of frost are likely to occur and close monitoring will be required. Particular attention should be given to the timing of precautionary treatments due to the possibility that salt deposited on a dry road may be dispersed before it can become effective.<br>3) Under these circumstances rain will freeze on contact with surfaces and full pre-treatment should be provided even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.<br>4) The effectiveness of salt decreases as temperatures fall and effective treatments may not be guaranteed with salt towards the lower end of the temperature band. The use of alternative treatment materials must be considered when spreading at (the lower of air or road surface) temperatures below -7°C or below -5°C in low humidity conditions (relative humidity <80%).</td></tr>
</table>

### 5.1.2 Guidance for repeat treatments for road surface temperatures expected to fall below 1˚C

| Possible need for repeat treatment(s) | Key information | Predicted conditions | Treatment guidance |
|---|---|---|---|
| Rain after treatment but before freezing | The current spread rates assume that little water is likely to be present on road surfaces in winter conditions, and this is normally the case (See Note 1)<br><br>Water on the surface will reduce the effectiveness of salt by:<br>• Dilution of any brine solution formed<br>• Causing salt wash off<br><br>As a guide, greater than 2mm will result in salt wash off and require retreatment. Use rainfall radar to determine and treat only effected areas where possible | More than 1mm of rain based on weather station data or radar or forecast | Make repeat treatment after rain stops, allowing as much delay as practicable for water to be dispersed by drainage and traffic before freezing. |
| | | Less than 1mm of rain based on weather station data or radar or forecast | Monitor and carry out repeat treatment after rain stops if required and allowing for water to disperse when practicable.<br><br>Road sensors can be used after rainfall to determine whether the freezing point of water on the road surface is low enough for the forecast minimum RSTs.<br><br>Make repeat treatment as soon as practicable where roads are wetter than allowed for in current spread rates (see Note 1) |
| Rain just before freezing | See Appendix B5 of the Severe Weather Plan template for information on effectiveness of salt after rain<br><br>Traffic aids the dispersal of water. If a road surface is well drained and has been trafficked for an hour or so after rainfall, relatively little water will be present at the road surface<br><br>There is a lower rate of loss when salt is in solution than in solid form. Salt will enter solution rapidly when road surfaces are wet | Freezing just after rain (<1 hour) | Make repeat treatment if freezing is forecast just after rainfall and roads are wetter than allowed for in current spread rates (See Note 1) |
| | | Freezing delay after rain (>1 hour but < 3 hours) | Delay initial treatment as long as practically possible after rainfall to enable trafficking to disperse surface water so spray is minimal.<br><br>Repeat treatment should be considered in poorly drained areas, where there is run-off and where (and when) there is little trafficking (e.g. lightly trafficked areas of slip roads, lightly trafficked roads on Sunday mornings)<br>(See Note 1) |
| Road wetter than allowed for in current spread rates, heavy hoar frost, freezing fog (See Note 1) | Higher spread rates or repeat treatments are required when more water (and/or less residual salt) is likely to be present than allowed for in the current rates | Heavy rainfall before treatment<br>Inadequate drainage or run-off<br>Heavy hoar frost<br>Freezing fog<br>Lightly trafficked roads | Increase initial spread rate (e.g. to the rate for the next temperature band) or consider making initial treatment at the specified rate and repeat treatment(s) at the same rate.<br><br>Conditions that are most likely to require repeat treatment(s) include:<br>• Poorly drained surfacing or open textured surfacing after heavy rainfall<br>• Lightly trafficked |

| Possible need for repeat treatment(s) | Key information | Predicted conditions | Treatment guidance |
|---|---|---|---|
| | | | surfaces (e.g. lightly trafficked areas of slip roads, lightly trafficked roads on Sunday mornings, bank holidays etc)<br>• Dew point above the road surface temperature:<br>(i) by several degrees<br>(ii) for a long period e.g. over long winter nights from late November to mid-January<br>(iii) when there is a light breeze that maintains moist air at the road surface |
| Change in forecast to more severe weather | A repeat treatment will be required when there is a decrease in the forecast road surface temperature and/or the forecast road surface state is wetter than was assumed for the initial treatment | Change in forecast to colder road surface temperatures or wetter road surfaces | • Make a top-up treatment if the spread rate for the changed forecast conditions is higher than the spread rate for the initial treatment |
| Temperatures below freezing spanning at most one peak period | The current spread rates assume a certain percentage loss of salt from road surfaces after spreading. The rates do not allow for loss over long periods. | Freezing occurring after one peak period and for duration less than 12 hours with no precipitation | Monitor conditions and only treat again before next peak traffic period if necessary.<br><br>Delay initial treatment as long as possible to reduce salt loss before freezing but without compromising dissolution of salt by trafficking etc.<br><br>Conditions that are most likely to required repeat treatment include when:<br>• Road surface is wet<br>• RST below -5ºC<br>• Heavy hoar frost forecast<br>• When forecast has changed following initial treatment<br>• Reports of ice on roads or hard shoulders (from patrols/Police/TSO) |
| Temperatures below freezing over up to 2 peak periods | The current spread rates assume a certain percentage loss of salt from road surfaces after spreading. The rates do not allow for loss over long periods.<br>In general it should be assumed that a repeat | Freezing from one peak period to just before or after another peak period, with no precipitation in the intervening period | Make repeat treatment before second peak traffic period and within 12 hours of the initial treatment.<br><br>Consider using a spread rate for the initial treatment for the road conditions forecast up to the time the repeat |

| Possible need for repeat treatment(s) | Key information | Predicted conditions | Treatment guidance |
|---|---|---|---|
| | treatment is required if an initial treatment is made just before (or during) one peak traffic period and temperatures will still be below freezing from just before to after the next peak period | | treatment has been completed.<br><br>Where possible, time repeat treatments to avoid spreading when the road surface temperature is less than -5˚C<br><br>It may be possible to either carry out the repeat treatment at reduced rate, or omit the repeat treatment when<br>• A number of treatments have been made over two or more days in dry weather and measured residual salt levels are high.<br>• The humidity is such that the road surface is drying, e.g. changing from wet to damp or dry (but see below) and no increase in humidity or precipitation is forecast for the period of the treatments effectiveness<br>• The minimum road surface temperature in the morning is at least one temperature band less than temperature band for the treatment made in the evening. |
| Sustained freezing (i.e. temperatures below freezing spanning at least 3 peak periods | Repeat treatments may be required when below freezing conditions are sustained over long periods.<br>Road surfaces can be essentially dry in periods of sustained freezing because of a lack of precipitation and low humidity conditions. In such conditions, repeat treatments may not be required when residual salt levels have built up and/or the road is dry such that the risk of ice formation endangering road users is low.<br>Treatments should be delayed if the salt that is spread will not enter solution.<br>Accumulations of undissolved salt in sustained freezing can significantly increase chloride levels in water | Freezing spanning at least 3 peak periods, with no precipitation in the intervening period. | Normally make treatments between each peak period so that the time between treatments is no more than 12 hours.<br><br>Where possible, time repeat treatments to avoid spreading when the road surface temperature is less than -5˚C<br><br>Monitor the dryness/wetness of the road surface and consider reduced rate treatments or treatments more than every 12 hours when residual salt levels are high and/or the road surface is essentially dry. |

| Possible need for repeat treatment(s) | Key information | Predicted conditions | Treatment guidance |
|---|---|---|---|
| | courses when they are dissolved during subsequent rainfall. | | |

Note 1. To calculate spread rates, it was assumed a wet road is one where minimal spray is evident and there is no water flowing across the surface. The maximum water film thickness for a well-trafficked road is 0.05mm and for a lightly trafficked road 0.1mm. Where road sensors indicate a wet road this indicates that more water is present than the maximum water film thickness allowed for in current spread rates and the treatment effectiveness will be less than stated in the treatment matrix guide.

### 5.1.3 Treatment Matrix Guide

| | Weather Conditions<br>Road Surface Conditions<br>Road Surface Temperature (RST) | Air Temp | Treatment | |
|---|---|---|---|---|
| | | | Dry Salting ($g/m^2$) | Pre-wetted Salting ($g/m^2$) (see Note 1) |
| 1. | Frost or forecast frost<br>RST at or above -2°C (irrespective of dry, damp or wet conditions) | | 8 | 8 |
| 2. | Frost or forecast frost<br>RST below - 2°C and above - 5°C and dry or damp road conditions | | 10 | 9 |
| 3. | Frost or forecast frost<br>RST below - 2°C and above - 5°C and wet road conditions (see Note 4 if lightly trafficked) | | 16 | 15 |
| 4. | Frost or forecast frost<br>RST at or below - 5°C and above -10°C and dry or damp road conditions (see Note 4 if damp and lightly trafficked and Note 6) | | 18 | 18 |
| 5. | Frost or forecast frost<br>RST at or below - 5°C and above -10°C and wet road conditions (existing or anticipated) (see Note 4 if lightly trafficked and Note 6) | | 2 x 15 | 2 x 15 |
| 6. | Light snow forecast <10 mm | | 20 | 18 |
| 7. | Medium/heavy snow or freezing rain forecast (see Note 5) | | 2 x 20 | 2 x 18 |
| 8. | Freezing rain falling | | 20 (successive) | See Note 3 below |
| 9. | After freezing rain | | 20 | See Note 3 below |
| 10. | Ice formed (minor accumulations) | above -5°C | 20 | See Note 3 below |
| 11 | Ice formed | at or below -5°C | 2 x 20 | See Note 3 below |
| 12. | Hard packed snow/ice | above -8°C | 20 (successive) | See Note 3 below |
| 13. | Hard packed snow/ice | at or below -8°C | salt/abrasive (successive) | See Note 3 below |

**The rate of spread for precautionary treatments may, if appropriate, be adjusted to take account of residual salt or surface moisture.**

**It has been assumed that two treatments are required to achieve spread rates at or exceeding $30g/m^2$.**

**Notes:**

1) **Spread rates for pre-wetted salt is the combined weight of dry rock salt and brine combined at 70:30 proportions by weight respectively with a maximum brine concentration of 23% salt.**
2) **Pre-wetted salt should always be the preferred treatment for all precautionary treatments whenever possible, including before snowfall.**
3) **When ice has formed or snow is lying dry salting is the preferred treatment unless the road is closed to traffic when pre-wetted salting may be used. Pre-wetted salting is the preferred treatment in advance of such conditions.**
4) **Treatments should be carried out, whenever possible, after traffic has dispersed standing water. Successive half rate treatments (for both pre-wet and dry salt operations) should be considered for lightly trafficked roads, or on more heavily trafficked roads at times of low traffic e.g. Sunday mornings, at the lower end of temperature bands indicated.**

5) **For snow covering forecast to exceed 30mm ploughing should be conducted early enough to ensure snow accumulations do not exceed 10mm. The rates in the table are for precautionary salt treatment prior to snowfall which is essential to form a debonding layer and aid snow clearance.**

6) **The effectiveness of salt decreases as temperatures fall and effective treatments may not be guaranteed with salt towards the lower end of the temperature band. The use of alternative treatment materials must be considered when spreading at (the lower of air or road surface) temperatures below -7°C or below -5°C in low humidity conditions (relative humidity <80%).**

7) **The spread rates are not applicable to very wet roads, when there is standing water or spray generated, or for very heavy hoar frosts. In these conditions roads should be closely monitored and consideration given to increasing the spread rate, making successive treatments or both.**

### 5.1.4 Precautionary Treatment Matrix Guide - Treatments, including alternative materials, when spreading in extreme cold

**Alternative treatments when RST below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)**

**Conditions:** Frost or Forecast Frost

| Dry rock salt component (% by weight) | | Rock Salt (70%) | Rock salt (70%) | Rock Salt (70%) | Rock Salt (70%) | Rock Salt (96%) | Rock Salt (100%) |
|---|---|---|---|---|---|---|---|
| Liquid component (% by weight) | | Magnesium chloride brine (30%) | Calcium chloride brine (30%) | ABP Brine [2] (30%) | Sodium chloride brine (30%) | Alternative liquid [3] added before loading (4%) | |
| Weather Conditions Road Surface Temperature (RST) | Road Surface Conditions | PRE-WET SPREADING [1] ($g/m^2$) | | | | DRY SPREADING ($g/m^2$) | |
| RST at or below -5°C and above -7°C (Only for low humidity conditions <80%) | Dry or damp road | 11 | 11 | 10 | 13 | 14 | 14 |
| | Wet road | 18 | 19 | 17 | 21 | 22 | 22 |
| RST at or below -7°C and above -10°C | Dry or damp road | 16 | 17 | 16 | 21 | 20 | 22 |
| | Wet road | 27 | 28 | 26 | 35 | 34 | 37 |
| RST at or below -10°C and above -12°C | Dry or damp road | 21 | 22 | 20 | 29 | 26 | 30 |
| | Wet road | 35 | 36 | 34 | 49 | 43 | 50 |
| RST at or below -12°C | Dry or damp road | 27 | 29 | 27 | 41 | 33 | 41 |
| | Wet road | 46 | 48 | 45 | 68 | 56 | 68 |

**Notes:**

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**
- **A follow up treatment of 50% of the recommended spread rate should be considered in lightly trafficked areas at the lower end of the temperature bands indicated.**
- **To take account of residual salt during periods of sustained freezing, when surfaces are well drained and there is no melt water or ice present, rates of spread for treatments carried out within 6 hours of previous treatments may be 50% of the rates in the table.**

1) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
2) **For definition of ABP Brine see Appendix B.3.**
3) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP Brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.3.**

### 5.1.5 Precautionary Treatment Matrix Guide - Treatments, including alternative materials, before snow and freezing rain when spreading in extreme cold

| **Alternative treatments when RST below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)** | | | | | | |
|---|---|---|---|---|---|---|
| **Conditions:** Forecast Light Snow or Moderate / Heavy Snow and Freezing Rain [1] | | | | | | |
| **Dry rock salt component (% by weight)** | **Rock Salt (70%)** | **Rock salt (70%)** | **Rock Salt (70%)** | **Rock Salt (70%)** | **Rock Salt (96%)** | **Rock Salt (100%)** |
| **Liquid component (% by weight)** | **Magnesium chloride brine (30%)** | **Calcium chloride brine (30%)** | **ABP Brine [3] (30%)** | **Sodium chloride brine (30%)** | **Alternative liquid [4] added before loading (4%)** | |
| **Weather Conditions Road Surface Temperature (RST)** | **PRE-WET SPREADING [2] ($g/m^2$)** | | | | **DRY SPREADING ($g/m^2$)** | |
| RST at or below -5°C and above -7°C (Only for low humidity conditions <80%) | 23 | 24 | 22 | 28 | 28 | 28 |
| RST at or below - 7°C and above - 10°C | 33 | 35 | 32 | 40 | 40 | 43 |
| RST at or below - 10°C and above - 12°C | 39 | 41 | 38 | 47 | 47 | 52 |
| RST at or below - 12°C | 47 | 50 | 47 | 58 | 58 | 70 |

**Notes:**

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**

1) **Treatments for moderate / heavy snow and freezing rain are as for light snow plus a follow-up treatment at half the recommended spread rates when no treatments in previous six hours.**
2) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
3) **For definition of ABP Brine see Appendix B.3.**
4) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP Brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.3.**

### 5.1.6 Reactive Treatment Matrix Guide - Treatments, including alternative materials, for compacted snow or ice when spread in extreme cold

**Alternative treatments when RST below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)**

**Conditions:** Compacted Snow or Ice

| Dry rock salt component (% by weight) | | Rock Salt (70%) | Rock salt (70%) | Rock Salt (70%) | Rock Salt (70%) | Rock Salt (96%) | Rock Salt (100%) |
|---|---|---|---|---|---|---|---|
| Liquid component (% by weight) | Magnesium chloride brine plus ABP (100%) | Magnesium chloride brine (30%) | Calcium chloride brine (30%) | ABP Brine [3] (30%) | Sodium chloride brine (30%) | Alternative liquid [4] added before loading (4%) | |
| Weather Conditions Road Surface Temperature (RST) | LIQUID SPREADING [1] ($g/m^2$) | PRE-WET SPREADING [2] ($g/m^2$) | | | | DRY SPREADING ($g/m^2$) | |
| RST at or below -5°C and above -7°C (Only for low humidity conditions <80%) | 24 | 28 | 29 | 27 | 34 | 28 | 28 |
| RST at or below -7°C and above -10°C | 24 | 40 | 42 | 38 | 48 | 40 | 43 |
| RST at or below -10°C and above -12°C | 30 | 46 | 49 | 46 | 56 | 47 | 52 |
| RST at or below -12°C | 36 | 56 | 61 | 56 | 76 | 58 | 70 |

**Notes:**

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**
- **As much material as possible should be removed by ploughing before applying de-icers.**
- **It may not be possible to treat and de-bond from the road surface ice / compacted snow layers exceeding 20mm thickness. Abrasives should be used until conditions become more favourable for de-icing.**
- **Frequent patrols should be made to determine the effectiveness of treatments and when further follow-up treatments are required.**
- **If the surface melts and becomes slippery an initial treatment of abrasives should be applied at a rate of $40g/m^2$ and successive treatments at $20g/m^2$ until an acceptable level of friction is restored. Care should be taken to make further applications where ice or snow melts and refreezes later leaving abrasives beneath the ice surface and therefore ineffective.**
- **The use of alternative de-icers can provide effective treatments in a shorter time scale than dry salt and salt pre-wetted with sodium chloride brine.**

1) **Liquid only treatments identified in this table must only be spread from a dribble bar in discrete lines across the carriageway. This treatment may also be used in conjunction with rock salt spread at $20g/m^2$.**
2) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
3) **For definition of ABP Brine see Appendix B.3.**
4) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP Brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.3.**

### 5.1.7 Footway and cycle track treatment snow clearance

| Category (see 1.3.2) | Overnight Frost Conditions<br>*overnight forecast temperatures below zero but not extending beyond 8am* | Daytime Frost Conditions<br>*overnight forecast temperatures below zero extending beyond 8am* | Extended Frost Conditions<br>*forecast temperatures remaining below zero throughout daylight hours* | Snow Events |
|---|---|---|---|---|
| 1a | Precautionary treatment | | Monitor and further treatment as required | Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 12 hours of cessation of snowfall, subject to availability of resources |
| 1 | No treatment | Reactive treatment (by 8am of that same day) | Monitor and further treatment as required | Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 24 hours of cessation of snowfall, subject to availability of resources |
| 2 | No treatment | Reactive treatment (by 8am of that same day) | Monitor and further treatment as required | Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 48 hours of cessation of snowfall, subject to availability of resources |
| 3 | No treatment | No treatment | Reactive treatment (by noon of that same day) | Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 5 days of cessation of snowfall, subject to availability of resources |
| 4 | No treatment | No treatment | Reactive treatment not normally undertaken other than in response to specific circumstances | |

## 5.2 Treatment/Actions

### 5.2.1 Precautionary treatment

The effectiveness of precautionary treatments can be significantly affected by how the treatment is applied. The following sections cover BBMM's procedures for precautionary treatment using the appropriate treatment material for each part of the Network.

Routes used by spreading vehicles will follow the appropriate WSR in Appendix A.18. BBMM will aim to apply treatment as close, as is practicable, to the forecast time of freezing, while allowing sufficient time for the salt to form brine. In particular applying treatments during the early evening, to protect against a forecast of ice forming in the early hours of the following morning, will be avoided. Where treatment is required the most appropriate treatment type and spreading techniques will be used.

The following sections should be developed taking into consideration the information in Appendices B.2, B.3, B.5 and B.6.

5.2.1.1 Treatment type

The Highways Agency's preferred treatment is pre-wetted salt, though other materials may be appropriate for specific conditions or circumstances.

The use of pre-wetted salt provides the following advantages over dry salting:

- Better salt distribution across and along the carriageway
- Lower salt loss during spreading and due to trafficking after spreading
- Increased dissolution, in particular for colder temperatures

For treatments on very wet roads and when precipitation has occurred after spreading, repeat treatments are required and spreading dry salt in these circumstances will not prevent the need for these repeat treatments.

BBMM will select the most appropriate material suitable for use across the Network taking into consideration the location and forecasted weather condition to maximise the effectiveness of the precautionary treatment as detailed below.

Spread rate guidance is contained within Section 5.1.1, Section 5.1.2, Section 5.1.3, Section 5.1.4, Section 5.1.5 and Section 5.1.6.

The de-icing materials used are detailed in Section 3.3.

All precautionary treatment routes have been designed to be completed [redacted] Routes are detailed in Appendix A18.

Priority will always be given to the treatment and clearance of the motorway and the all-purpose trunk road network. When resources become available and all routes on the road network are clear of snow or ice, effort will be directed to the treatment and clearance of footways and cycle tracks.

BBMM will carry out treatments by use of 6.3mm rock salt to BS 3247: 2011 to footways and cycle tracks by hand application. Route Cards for footpaths and cycle tracks can be found in Appendix A18. Further details can be found in Section 4.2.

There is only a small amount of maintained footway in Area 10 and these footways are categorised such that only [redacted] are required. There are only category [redacted] Area 10 as shown in Appendix A18. The timing and type of treatment will wherever possible be coordinated with local highway authorities to ensure that footways and cycle ways are treated consistently along their length. The treatment is based on the principles contained within the Treatment Table above with variations from the defined treatments being acceptable to suit local conditions. However where a local authority has chosen not to undertake any treatment at all, it is not acceptable to follow their approach.

Reactive treatment will occur if comments are received that footways are in an unsafe condition due to ice. Reactive treatment will not occur purely on the basis that Road Surface Temperatures reach zero in the vicinity.

Snow clearance and reactive treatments will be carried out by hand application.

5.2.1.2 Spreading techniques and operational considerations

Consideration will be given to traffic conditions and the timing of winter maintenance

Operations in accordance with Working Windows and any JTR requirements

Wherever possible precautionary salting will be undertaken in off-peak periods when disruption to traffic will be minimal, although the effectiveness of treatment must not be compromised. If precautionary treatment in heavy traffic is unavoidable it may be necessary to seek Police/RCC assistance (including motorway matrix signals) or to consider treatment in two runs to ensure the required dosage and distribution of the salt. Treatment cannot occur effectively in the stop-start situation common as a result of very heavy traffic typically found on the Area 10 network during peak periods.

Care should be taken at road works and major schemes to ensure that in addition to areas currently open to traffic, all other areas likely to be opened to traffic are treated. Traffic management equipment, including cones and cylinders, may disrupt continuous and even distribution of salt. Therefore contra flow systems should be treated in both directions. Close liaison with schemes on the network will ensure that the entire carriageway is treated prior to the removal of traffic management.

The [redacted] fleet has a maximum spread width of [redacted]. A maximum spread width of [redacted] will only allow for salt to be spread to [redacted]

All treatments carried out across Area 10 are tracked by [redacted] tracking, This enables real time tracking of the vehicles including reports of salt dosage, width and timings,

In addition the following protocol should be followed when treatments are carried out where signals are available.

PROTOCOL FOR THE USE OF VARIABLE MESSAGE SIGNALS DURING SALT SPREADING OPERATIONS

The legend **"SALT SPREADING IN PROGRESS"** will be set on the respective treatment route **prior** to treatment operations commencing on the Area 10 network.

The NCC will contact the North West Regional Control Centre (RCC) at the start of the Treatment and ask for the signals to be set. The NCC will await confirmation that the signals have been set prior to the treatment starting.

Operatives should not assume that Variable Message Signals will always be in operation for treatment purposes. If an incident of a more urgent nature occurs then the signals will be overridden to cater for that need.

Operatives should not assume that VMS's are reliable and be aware that they are set as an information tool for the general public.

At the time of activation the NCC will ask for the VMS to be switched off 3 ½ hours after activation. If for any reason an operative has not completed his/her route within agreed 3 hour treatment timescale, the NCC will contact RCC and request that the VMS remain active.

Conditions for low humidity normally occur when relative humidity levels are below 80%.

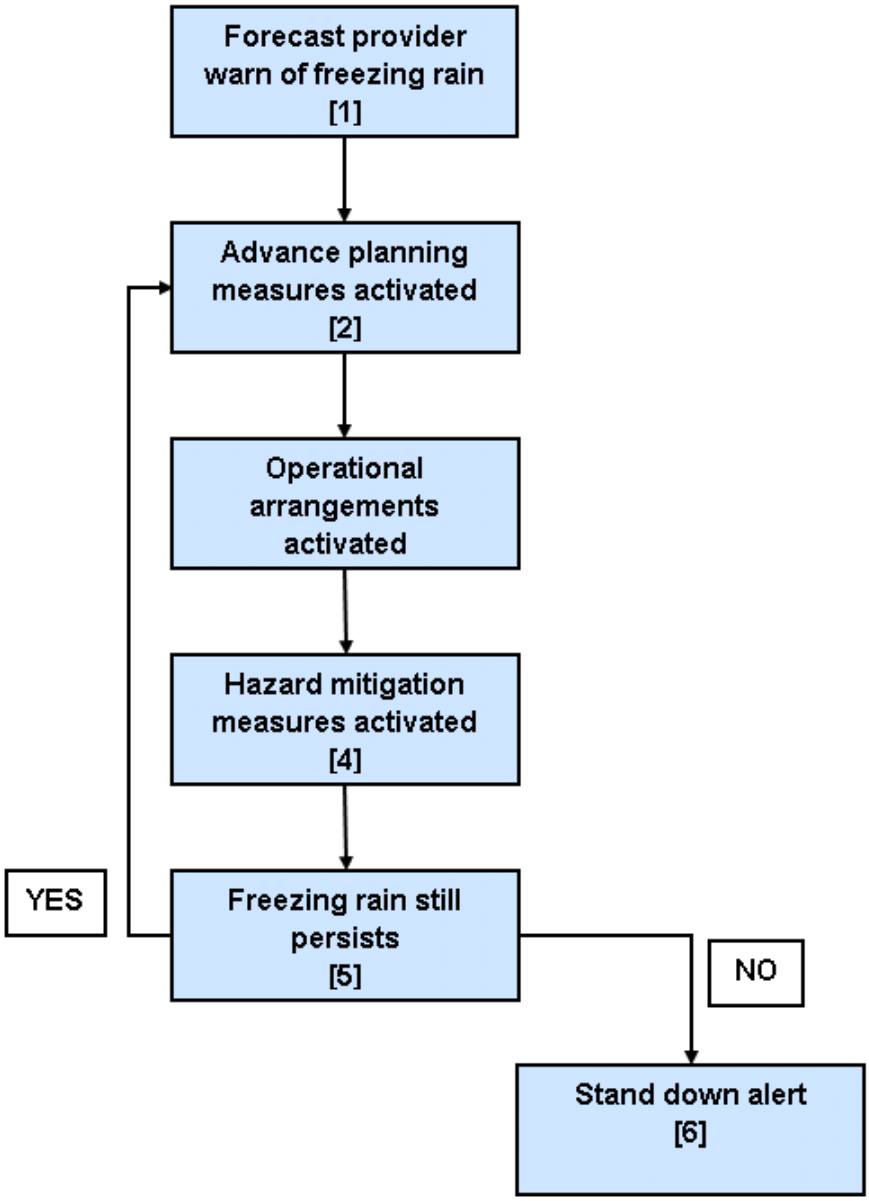
In such conditions BBMM will conduct pre-wetted treatments. Pre-wetting increases the moisture content of salt which is spread on the road increasing its density resulting in less air born wastage and allowing it to go into solution quickly.

- ***Effectiveness of salt after rain:*** BBMM will take into account the advice shown in Appendix B.5 and Appendix B.3 undertaking precautionary treatments using the most appropriate substance to address the current prevailing or forecast conditions.
- ***Low temperature combined with low humidity conditions***: BBMM planned precautionary treatments are based Route Based Meteorology Forecasting (and Optimised in accordance with AMOR), this forecasting model has identified vulnerable locations following a sky view survey carried out by the Met Office and takes into account the information contained in Appendix B.5. (With low humidity weather conditions and dry roads it may not always be necessary to treat when RSTs are forecast to fall below freezing. The Highways Agency RWIS/ESS is equipped with sensors which monitor humidity and road surface state). Pre-wet treatments will be favoured in these conditions. Alternative treatment materials have been noted.
- ***Extreme cold, when salt may not provide for an effective treatment***: In circumstances of sustained road surface temperatures of less than -7°c, BBMM will ensure that the carriageway is treated with the aid of pre-wetting and take into account the information contained in Appendix B.5. The NCC and SWO will closely monitor incoming weather forecasts so that if required measures can be put in place if low temperatures arise, this will include informing the HA Press Officer, RCC, HATOs, Police and BBMM staff of the increased risk to the formation of ice. Variable Message Signs should be used to warn the travelling public of any increased risk. More Guidance was issued last year under AMM 140/12 and reinforced this year under AMM 141/13 regarding alternative treatment materials; this is shown in Appendix B3.
- ***Freezing rain & rain falling onto frozen surfaces:*** BBMM must give special consideration to the treatments required before, during and after freezing rain and must take account of the information contained in Appendix B.5. Contact with the [redacted] both in advance of forecasted Freezing Rain and during the event is essential in order to plan and minimise the effect this will have on the road surface and the travelling public. Following research undertaken further guidance in conjunction with the NWSRG will be issued shortly to clarify the Service Providers procedures for dealing with Freezing Rain. A Severe Weather Desk will be established in advance of any anticipated freezing rain.

  Freezing rain can be split into two categories;

  - Super cooled freezing rain (most hazardous of all weather types)
  - Non-super cooled freezing rain (Rain falling onto frozen surfaces) - *Occasionally freezing rain occurs even though the air temperature is above zero. For example, after several clear frosty nights the deep temperature becomes very low. The next night starts clear and frosty but then rain pushes in quickly from the west. The rain is accompanied by warmer and thicker cloud rising the air temperature above zero. However, due to the deep temperature being very low the surface temperature is slower to rise and can still be below zero when the rain begins to fall. Thus leading to icy roads.*

    *See below freezing rain flowchart*




- ***Cross winds:*** Only high altitude routes are susceptible to strong cross winds, this is detailed on the route cards under 'Special Route Features' in Appendix A.18. The SWO & SWV should however be mindful that on structures vulnerable to high winds there may be an element of salt loss; this may necessitate further consideration of additional applications.
- ***Negatively textured surfacing:*** BBMM will give consideration to the treatment of NTS and will take account of the information contained in Appendix B.5.
- ***Porous asphalt:*** Currently there are no areas of porous asphalt on the Area 10 Network. Therefore no special arrangements need to be implemented.
- ***Areas susceptible to run off with the potential to re-freeze;*** treatment routes that are susceptible to this are instructed to treat with the 'blast' function as detailed on the route card

'Special Route Features' in Appendix A.18, these areas also have salt bags deployed at these locations ensuring that any run off is saline, in addition to this there is further information contained within Section 1.3.4 and Appendix A 20 Vulnerable Locations, BBMM will also take account of the information contained in Appendix B.5.

- ***Vulnerable sites**:* BBMM planned precautionary treatments are by based Route Based Meteorology Forecasting (and Optimised in accordance with AMOR),, this forecasting model has identified vulnerable locations following a sky view survey carried out by the [redacted] and takes into account the information contained in Appendix B.5.

BBMM will, where feasible, treat only targeted areas of the Network based on where ice formation is forecast.

### 5.2.2 Reactionary treatment for snow and ice

The effectiveness of treatments of snow and ice can be significantly affected by the method of application of the treatment. The following sections cover BBMM's operational techniques for the removal of snow and ice. The techniques include ploughing, blowing, the use of snow fences and snow gates together with changes to the methods of application of treatment materials when snow or ice is already present on the paved area. Guidance is provided in Appendix B.6.

It is important that all routes are cleared, in accordance with the snow clearance requirement provided within section 4.1.2, and that no area is abandoned for the sake of concentrating resources to one or two problem areas. Any decision for route closure or abandonment can only be made by the HA incident commander, to be advised within the improved coordination process. In all cases therefore the defined treatment routes will be adhered to, and where conditions demand a more intensive treatment in specific areas, this will be achieved by calling out Area Operational Reserve Winter Service Vehicles for those areas.

#### 5.2.2.1 Ploughing and snow clearance techniques

When a forecast warning of snow is received precautionary salting will be carried out in accordance with the treatment matrix in Section 5.1.3 or Section 5.1.5 (for extreme cold). The instruction to fit snowploughs will be given before the commencement of snowfall and will require all Duty Supervisors to confirm to the SWO when this action has been completed. Consideration will be given to the times for precautionary salting taking into account the fitment of ploughs.

When a forecast warning of snow is received it is important to consider the establishment of Severe Weather Desk arrangements as soon as possible. The Highways Agency must be informed of any potentially difficult conditions and the intended time of Severe Weather Desk implementation.

In periods where the timing and intensity of snow fall is difficult to forecast and falls are heavy and localised, all depots and operatives are placed on stand-by.

The SWO and the NCC must monitor the HA CCTV cameras at the RCC and HAWIS; this will be further aided by weather forecast information from the Met Office. Network information will also be collated from BBMM staff, Traffic Officers, Police and other stakeholders including adjacent HA Areas.

A WMO/DS from each depot will undertake a Snow Patrol Scout. This SPS will cover the routes that are carried out from each specific depot and will target vulnerable locations that are susceptible to inclement weather and that are at the highest risk following weather forecast information.

The SPS will report back to the SWO when snow fall starts to commence, it will be at this point that the SWO will instruct all WMOs to go out and treat. Under **NO** circumstances should

operatives commence salting without prior authorisation of the SWO, all reports of snow precipitation should be reported to the NCC to ensure that this is logged on the WRF1 and that the appropriate action is formulated by the SWO.

All Winter Maintenance Vehicles **MUST** be stored in the garage at all times other than when leaving to commence a treatment, it is also of vital importance that the garage doors remain closed to prevent temperatures from falling within the depot buildings and resulting in vehicle fluids freezing up or ice forming on the apparatus.

During periods of prolonged snow fall, ploughing will be continuous to prevent build-up and will be supplemented by simultaneous de-icing at a rate of 10g/m² of the lane being ploughed.

Plough height will be set to 0mm to remove the maximum amount of snow. The black rubber rubbing strip at the bottom of the plough will need to be checked and replaced as required.

Where continuous ploughing is required the following strategy shown in the below table will be carried out to ensure compliance with the AMOR requirements in respect of the red, amber and green routes.

- If snow depths reach 120mm, when tackling drifts, or working on gradients the salt shall be used as payload to assist vehicle traction and salting suspended.
- The specified procedures for snow ploughing on single and dual carriageway roads must be maintained.
- Route priorities for snow ploughing action shall be carried out under the ASC's instruction.
- Accumulations of snow due to drifting or ploughing may require the use of snow blowers at locations where snow can be safely discharged onto verges or other areas and snow clearing plant may need to be employed to maintain access to side roads or dual carriageway central reserve crossovers.
- Particular attention shall be given to ensure free flow of vehicles at interchanges and slip roads where the bulk removal of snow may be required.
- The decision on when to activate the Snow Blowers will be taken by the Severe Weather Officer who will take advice from the Met Office as to what weather conditions will be expected to prevail and also consult with the regional HA Regional Winter Coordinator Steve Lewis.
- Ploughing techniques will take reference from Appendix B6.
- It is important that all the defined routes are cleared and that no area is abandoned for the sake of concentrating resources to one or two problem areas. In all cases therefore the defined treatment routes will be adhered to, and where conditions demand a more intensive treatment in specific areas, this will be achieved by calling out a reserve vehicle for those areas.
- When clearing 4 lane carriageways, consideration should be given to abandoning lane 4 rather than creating problems of excess snow on the central reserve. Liaison with the police and Highways Agency Traffic officers should always take place when adopting this procedure.
- Slip roads and interchanges: It is important to maintain the free flow of vehicles at interchanges. At least one lane of each slip road shall be cleared as soon as possible together with the adjoining roundabout.
- Dual Carriageways without hard shoulders: Ploughing should commence on lane 1 ploughing to the nearside, subsequently lane 2 ploughing to the central reservation.

- Snow Gates - Emergency Crossing East of M62 Jct. 22: During snow conditions as described earlier routes will be amended on the M62, included in this is the potential use of the Snow Gates central reserve crossing point east of Junction 22, Area 10 will carry out the ploughing and salting of the emergency. The gates are checked prior to the onset of the winter period with the hinges and lock being greased / oiled as appropriate. The lock fitted is unique to Area 10 and is an [redacted] that needs minimal attention.

- There is an alternative to using the Snow Gates at J22 if it is considered to be unsafe by using the works access underpass at Scammonden Water Works Unit as a turning facility. The gate is locked and the access number will be made aware to all WMOs using it.

- The M58 has been susceptible to drifting snow over the last 4 winters and with added severe cold temperatures, this has proven to be problematic when trying to plough snow from lane 3 into the central reservation as this has frozen and cannot be removed using conventional ploughing methods.

BBMM Duty Supervisor will inform the NCC when it is no longer possible to plough snow from lane 3 and that the snow has frozen.

The RCC will set Matrix showing lane 3 closed, this will be kept on until lane 3 is cleared of snow/ice.

Regular checks will be carried out by the BBMM Duty Supervisor to establish if it possible for snow to be ploughed, this however will require an increase in road surface temperatures and a partial thaw for this to be achievable.

The NCC will update the RCC every 12 hours of the current status of this part of the network.

The Highway Agency advised that Combi Spreaders which have the ability to spray chemicals onto frozen surfaces, are available and are being used.

*Note: A specific plan for this location needs development and strategy agreed with TOS and Area Teams.*

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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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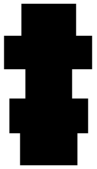
|  |  |  |  |  |  |  |  |  |  |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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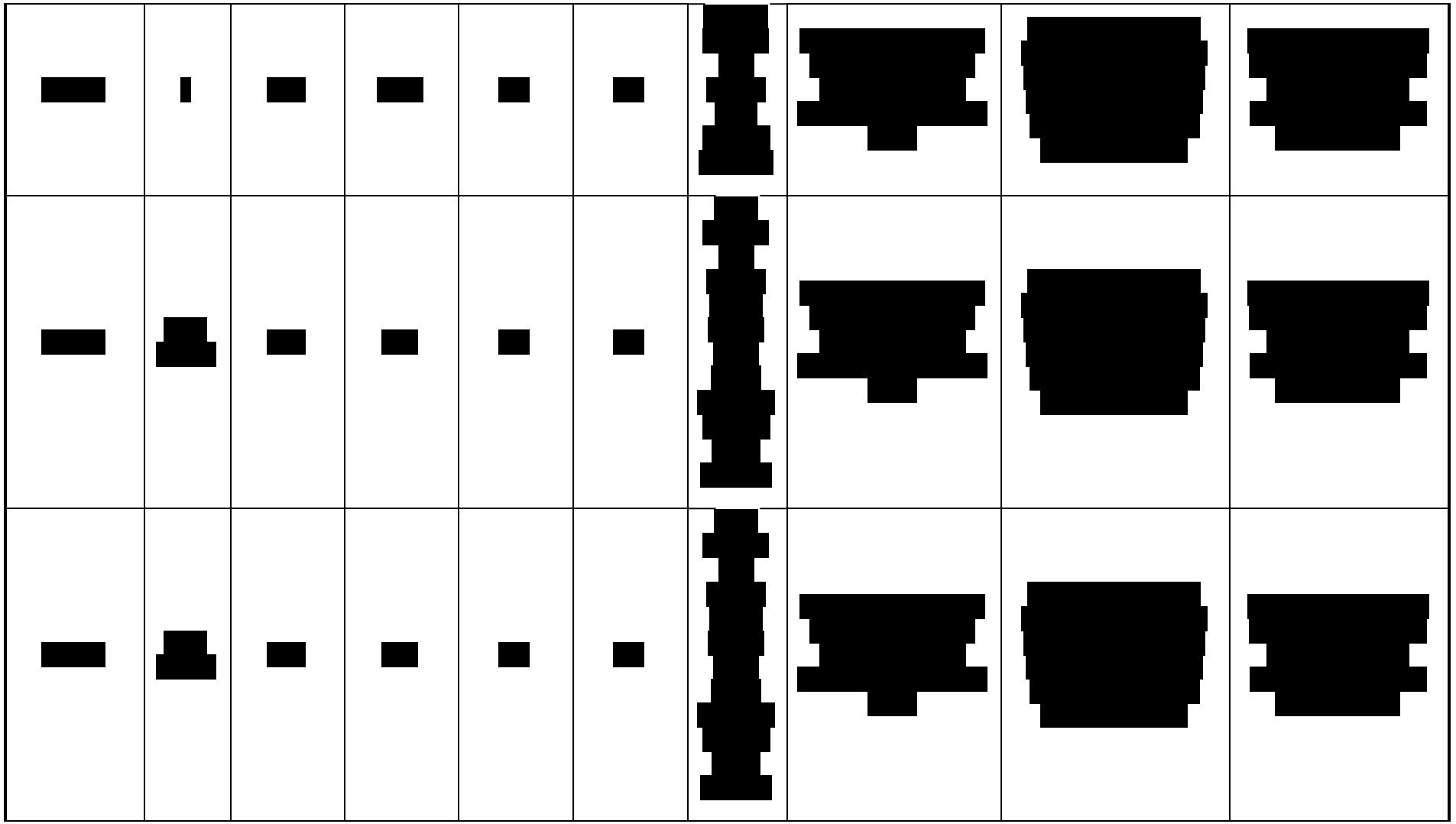

| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
|---|---|---|---|---|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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| Depot | Route | Route colour | Time | Prone to heavy Snow fall | Heavily trafficked | Route type | Ploughing Strategy | Depot | Route |
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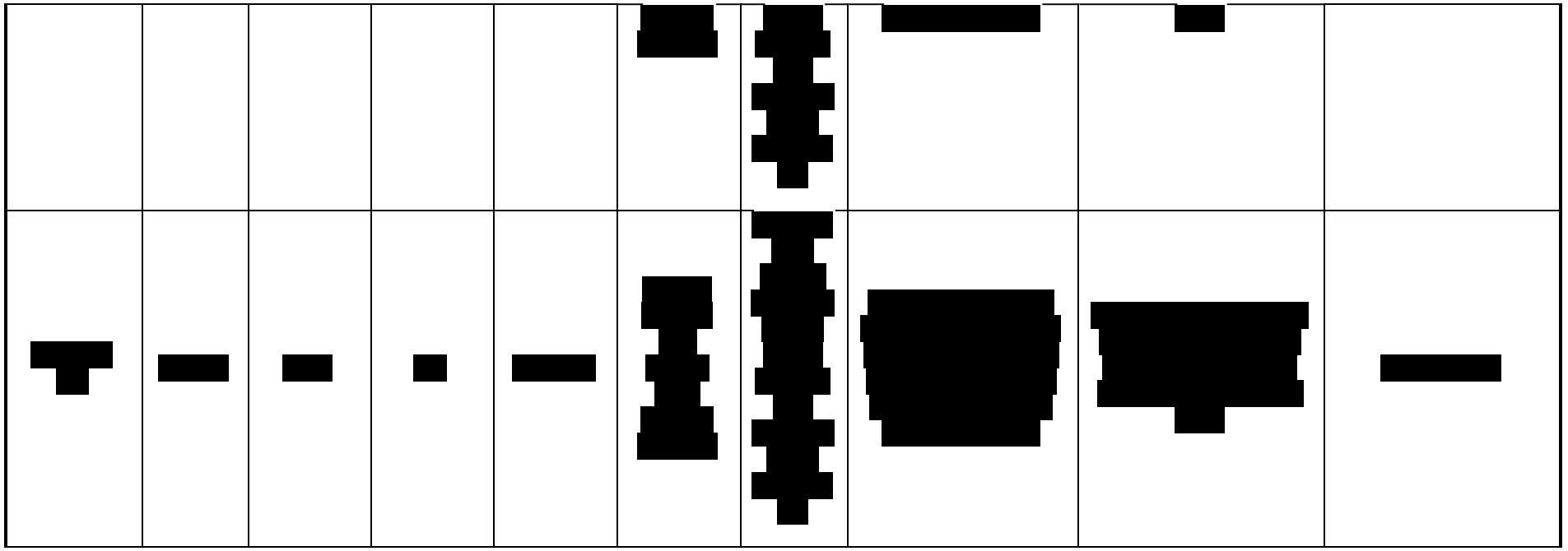


Note: all routes are passed twice by either a primary treatment vehicle or a secondary vehicle on free run (travel) to another route

a) On 1st pass primary vehicle to Plough L1 into HS, also treat lanes 1 & 2 with 10gms of salt

b) Primary vehicle on 2nd pass or secondary vehicle on first pass to plough Lane 2 into L3 and treat lanes 2 & 1 with 10gms of salt

c) Following the cessation of snow fall resources will be made available to clear L3/4 and H/S within 12 - 24hrs

BBMM's clearance plan for each SVB location is given in Appendix A.19. This schedule should also be cross referenced to Appendix A.18 – Winter Service route schedules and drawings.

Snow will not generally be allowed to build up across any bridge due to the additional pressures the weight may exert on the structure; any build up will be removed by using ploughs in echelon taking the snow to the nearside beyond the structure limits, if necessary bulk snow will be removed by means of heavy transport and a loading shovel under a lane 1 closure.

Emergency Crossing Points are maintained by the BBMM Safety Fence Team.

Liaison with our Abnormal Loads Officer will also take place to ensure that she is aware of network conditions in order that she can advise hauliers as necessary.

5.2.2.2 Spreading techniques

The preferred method of de-icing by BBMM is pre-wetted salt and this will be used in the first instance unless there are overriding factors preventing this taking place, subsequent treatments will be dry salt or pre-wetted subject to the availability of brine which takes approximately 4 hours to produce. Pre-wetted or dry salt is suitable for use across the entire Area 10 Network. Refer to Section 5.2.1.2 plus Appendix A.18 and Appendix B.5 for site/special conditions.

5.2.2.3 Aftercare and follow up treatments

Clearance of non-strategic areas of the Area 10 Network will be dealt with on a priority basis as plant labour and materials become available from maintaining the core part of the network. These areas include lay-bys, rest areas and footways.

When resources become available hard shoulders, lay-bys, rest areas and footways and cycle paths will have snow cleared and be made safe for the travelling public.

Upon clearance of the hard shoulders, assistance will be offered to [redacted] to help clear their facilities.

5.2.2.4 Arrangements for use of blowers

[redacted] can use snow blowers allocated to their Network without prior approval but must ensure the use is notified up to [redacted] (National Winter Specialist). National procedures for management of the both Area Operational Reserve Winter Service Vehicles and National Reserve Vehicles are in Appendix B.4.

Where the equipment is to be brought in from another area the Service Delivery Manager will liaise, as necessary, with the National Winter Specialist and other relevant parties.

BBMM has [redacted] qualified to operate snow blowers as detailed at Appendix A.13.

### 5.2.3 Freezing rain / rain falling on extremely cold surfaces

5.2.3.1 Operational considerations

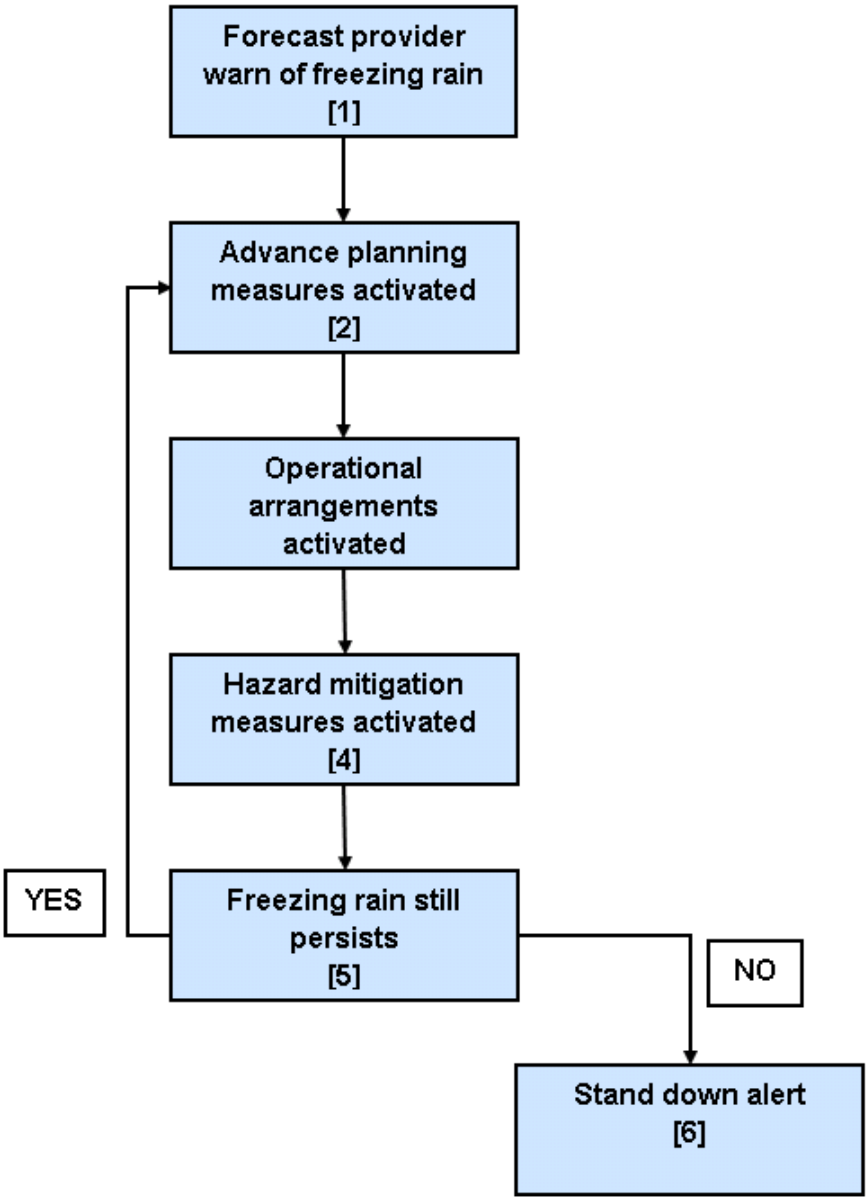
Freezing rain and must take account of the information shown at Section 5.2.1.2 and in Appendix B.5.

The Area 10 Network as it is varied in topography and if the underlying weather conditions apply this weather phenomenon can strike anywhere across the network. Our weather forecast provider [redacted] will provide advance warning of the likelihood of such an occurrence thus allowing planning to take place alongside continued engagement with [redacted] however this is not foolproof and a location not forecasted can still be subject to this weather element.

Upon receipt of weather forecasts of freezing rain / rain falling onto extremely cold surfaces BBMM will have WMO on standby in depots to respond to any reported instances of this weather phenomenon. A Severe Weather Desk will also be activated.

The conditions created by freezing rain can result in black ice being present on the surface with the potential for road traffic collisions. Where collisions do occur then the police in the interest of safety may close the carriageway to prevent further instances until the conditions have ceased and the carriageway has been treated making it safe for use by the travelling public.

The RCC will be advised of such problems in order that the fixed VMS on the network can be used to display an appropriate message.



5.2.3.2 Hazard mitigation

The nature of freezing rain means that treatments will have virtually no effect initially and ice will form on the carriageway. Rain falling on extremely cold surfaces can produce similar effects. Mitigation of the hazard is therefore a significant aspect of the actions taken in response to freezing rain or rain falling on extremely cold surfaces. The main action is to inform road users of the hazard where available fixed or mobile Variable Message Signs (VMS) will be used as detailed in Appendix B.5.

More proactive measures such as closing the road as the rain arrives and holding the traffic (rather than diverting) until such times as it is deemed safe to proceed may be considered. Such considerations will need to be made on a local basis taking into account local circumstances.

BBMM will liaise with Police Control Offices (PCOs) and / or RCCs to provide advance warning to recovery companies when any incidents occur as a result of the freezing rain or rain falling on extremely cold surfaces.

### 5.2.4 High winds (including Severe Gales and Storms)

High winds/severe gales can occur at any time of year but are most likely from September through to June.

5.2.4.1 Operational Considerations

The Area 10 network covers a large geographical area of the North West of England. Due to the size of the Area 10 network severe weather events and their impact upon the network vary greatly. Exposed structures can become susceptible to closure due to strong winds which can cause severe congestion across the network. Details of exposed structures can be found within Appendix A.5.

In the event of a High Wind / Gale Force Wind Severe Weather warning being received from NTCC, [redacted] or Highways Agency Area team, BBMM will request that additional resources be made available from relevant stakeholders for the duration of the high risk period. In addition the Traffic Officer Service, Local Authorities and Police Forces are informed of the impending conditions to enable them to make necessary arrangements prior to the onset of strong winds.

The following points will be acted upon in advance of, and maintained throughout High Wind events.

- Liaison with the Highways Agency North West Regional Control Centre Operations Manager to give advice and assistance with the implementation of the North West Traffic Officer Service High Wind Strategy as shown below.
- Liaison with relevant Stakeholders to agree resource requirements for the duration of the high risk period.
- VMS are activated by the RCC to show “HIGH WINDS SLOW DOWN” in various locations across the Area 10 network for the duration of the high risk period.
- [redacted] will provide detailed information on the severity of the impending conditions and provide regular updates.
- Horticultural specialists are placed on stand-by to mitigate the effects of fallen trees.

- The RCC make use of the various fixed anemometers that are available to them, by viewing them on the screens in the RCC, and that resources, both TOS and MRT can be pre-deployed to known vulnerable locations as wind start to pick up, in case incidents occur, in which case they can be resolved quicker.

- Liaison with Major Schemes TSCO staff to monitor or arrange the removal of traffic management before the onset of High Winds.

- A global e-mail is sent to all Area 10 staff to give prior warning of the impending conditions.

- In the event of an incident occurring on the network a BBMM team will be dispatched to the scene by the NCC. BBMM will provide traffic management support and can also provide visual feedback with the use of vehicle mounted CCTV.

- BBMM will assist the Highways Agency Traffic Officer Service as required throughout the high risk period to enable a swift return to normality following any incidents on the network.

- The BBMM Area 10 Contingency Plan will be used in conjunction with the Area 10 Severe Weather Plan and the Highways Agency North West High Wind Strategy to ensure a robust defence against dealing with High Winds across the Area 10 Network.

- Where a route becomes impassable or becomes congested the RCC will set diversion routes around the network as required and implement the High Wind Strategy with the use of VMS. Media liaison can also be used to reduce congestion.

## North West Region Briefing Note 26

## Revisions of NW High Wind Strategy

Intention

The intention of this briefing note is to outline the revisions to the Highways Agency's high wind strategy for the North West motorway network.

Information

In response to the high wind events of 2007 and early 2008, the Highways Agency formed a high wind strategy working group to review our operational plans. The aim for this group was to create a regionally consistent approach for the monitoring of and response to high wind events and to better prepare the agency and its stakeholders for the future.

The long term objective of the group is to have a comprehensive strategy for dealing with traffic during high wind events, including:

- Revision of the high wind protocols
- Strategic motorway to motorway diversion routes which are automatically activated by anemometers
- Tactical off network diversion routes where traffic can be directed if motorways are closed due to high winds
- Tactics for dealing with diverted traffic (e.g. stacking / filtering of traffic)

Progress has been made since the high wind strategy was introduced to the region on 13th October 2008 and we are now in a position to make amendments based on the feedback we have received.

The main changes are:

1. In response to feedback, we have increased the minimum wind speed for activation of the strategy from 25 mph to 35 mph (alert level 2). It was found that as the signs and signals were setting regularly at relatively low wind speeds, drivers were becoming complacent and ignoring them as the messages displayed did not match the prevalent weather conditions.
2. Signage plan A now sets automatically – there is no need for the RCC to set any of the signs within signage Plan A, including the portable VMS, as these are all now done by the met subsystem.
3. Alert level 3 has been amended to take account of the fact that at present, we are not in a position to divert high sided vehicles from motorway to motorway. Alert level 3 will continue for now as an extension of level 2, with additional preparatory actions for Alert level 4 status.

It is worth noting that for the traffic officer service, the service providers and the police, the high wind protocol sits alongside well established severe weather and winter maintenance plans. These plans outline the preparatory actions required in the advent of adverse weather forecasts and are to be used in conjunction with planning for amber and red met office weather alerts.

| Alert Level | Wind Speed (gust – mph) | Strategy | Actions | | Minimum Time Period for Implemented Actions |
|---|---|---|---|---|---|
| 1 | 0-34 | ***No action for motorists*** | **RCC** | • Monitor weather<br>• Check all VMS / COBS are working | NA |
| | | | **TO's** | • Monitor weather | |
| | | | **ASC's / MAC's** | • Monitor weather<br>• Check all portable VMS are working | |

| | | | | | |
|---|---|---|---|---|---|
| **2** | **35-44** | ***Warn motorists*** | **RCC** | • Monitor implementation of auto signage Plan A<br>• Monitor anemometer display to see if wind speed is increasing<br>• Notify on road traffic officer crews of wind event in their patrol area<br>• Advise NTCC<br>• Advise Press Officer<br>• Advise ASC / Police / APT | 20 min |
| **3** | **45-59** | ***Prepare for alert level 4*** | **RCC** | • Maintain monitoring of signage Plan A<br>• Deploy TO's to scene to monitor<br>• Inform Duty OM<br>• Duty OM to consider setting up a Silver command<br>• Notify on road traffic officer crews of wind event in their patrol area<br>• Advise NTCC<br>• Advise Press Officer to circulate a media message<br>• Advise ASC / Police / APT | 20 min |
| | | | **TO's** | • Deploy resources as required | |
| | | | **ASC's / MAC's** | • Deploy resources as required | |
| **4** | **60+** | ***Following consultation Duty Operations Manager to close motorway*** | **RCC** | • RCC Team Manager to inform Duty OM when speed reached<br>• Duty OM to set up Silver Command<br>• Duty OM to liaise with FIM and APM on appropriate closure<br>• Implement appropriate NW closure signage and diversion plans if instructed by Duty OM<br>• Advise NTCC<br>• Advise Press Officer to circulate a media message<br>• Notify on road traffic officer crews of wind event in their patrol area<br>• Advise ASC / Police / APT / LA | 20 min |
| | | | **TO's** | • Carry out instructions from Silver | |
| | | | **ASC's / MAC's** | • Carry out instructions from Silver | |

Red on DDS display in RCC indicates Anemometer **OUT OF SERVICE**

**Alert level 1**

There is to be very little action at this level apart from monitoring.

**Alert level 2**

Signage plan A will be automatically implemented. This signage plan sets advisory warning signs at pre-set locations around the anemometer locations. It also sets signals to 50 mph on exposed stretches and structures [1]. Once set, the plan will remain in place for a minimum of 20 minutes. This will avoid confusing motorists with signs quickly coming on and off when the average gust speed fluctuates around the lower or upper limit of the alert level. As part of this signage plan, there are actions for Traffic Officers, the RCC and the ASC's / MAC's (service providers).

**Alert level 3**

Signage plan A will be maintained. It is envisaged that in the future Traffic Officers will intervene to actively stack / filter high sided vehicles so they do not pass through high wind areas. Once set, the plan will remain in place for a minimum of 20 minutes. This will avoid confusing motorists with signs quickly coming on and off when the average gust speed fluctuates around the lower or upper limit of the alert level. As part of this signage plan, there are actions for Traffic Officers, the RCC and the ASC's / MAC's (service providers).

**Alert level 4**

At this stage, the wind will have an average gust speed above 60 mph and a Silver Command will have been implemented. The Traffic Officer Service Duty Operations Manager will contact the FIM (Force Incident Manager) from the relevant force area and the APM (Area Performance Manager) and the decision will be made on whether to close the motorway [2]. If the decision is taken, the Traffic Officers will close the motorway with assistance from the ASC's / MAC's and the RCC will sign that the motorway is closed offering appropriate diversion routes. The signage plans will follow the standard RCC closure plans. Once the decision has been taken, the closure will remain in place for a minimum of 20 minutes upon which time the decision will be reviewed at Silver Command. This will avoid confusing motorists with signs quickly coming on and off when the average gust speed fluctuates around the lower limit of the alert level. There are several actions for Traffic Officers, the RCC and the ASC's / MAC's when the decision is taken to close the motorway.

**Gust Speed**

This is calculated on a rolling five minute basis, sampled every second. In other words, it is the highest gust speed in a rolling five minute period.

Notes:

[1] It has been agreed that advisory speed limits will never be set lower than 50 mph on any motorway for a high wind event. The reason for this is that if you slow vehicles down too much, you increase their susceptibility to being blown over

[2] Although the direction of the wind may be a key factor in the effect it can have on traffic, it is being disregarded for all alert levels apart from level 4. At level 4, the Duty Operations

Manager, the FIM and the APM may decide to keep the motorway open if the direction of the wind is favourable and the traffic is not at risk.

## Signage Plan A

| Anemometer Location | Motorway | Variable Message Sign (VMS) | Setting | Matrix | Setting |
|---|---|---|---|---|---|
| **Weaver (Proposed)** | M56 | | | 8422A | 50 |
| | | | | 8447B | 50 |
| | | | | 8474B | 50 |
| **Thelwall (MP 302/1B)** | M6 | 7012A | STRONG WINDS ON BRIDGE | 7012A | 50 |
| | | 7001A | STRONG WINDS SLOW DOWN | 7001A | 50 |
| | | 6987A | STRONG WINDS SLOW DOWN | 6987A | 50 |
| | | 7017A | STRONG WINDS SLOW DOWN | 7017A | 50 |
| | | 7021B | STRONG WINDS ON BRIDGE | 7021B | 50 |
| | | 7036B | STRONG WINDS SLOW DOWN | 7036B | 50 |
| | | 7011B | STRONG WINDS SLOW DOWN | 7011B | 50 |
| | | 7030B | STRONG WINDS ON BRIDGE | 7030B | 50 |
| | | 7042B | STRONG WINDS SLOW DOWN | 7042B | 50 |
| **Barton (MP 17/5B)** | M60 | 9172A | STRONG WINDS ON BRIDGE | 9172A | 50 |
| | | 9163A | STRONG WINDS SLOW DOWN | 9163A | 50 |
| | | 9180B | STRONG WINDS ON BRIDGE | 9180B | 50 |
| | | 9193B | STRONG WINDS SLOW DOWN | 9193B | 50 |
| | | 9190L | STRONG WINDS SLOW DOWN | 9190L | 50 |
| | | | | 9186M | 50 |
| | | | | 9183M | 50 |
| | | | | 9165K | 50 |
| **Rakewood (MP 71/5A)** | M62 | 1708A | STRONG WINDS SLOW DOWN | 1708A | 50 |
| | | 1719B | STRONG WINDS SLOW DOWN | 1719B | 50 |
| | | 1727B | STRONG WINDS SLOW DOWN | 1727B | 50 |

| | | | | | |
|---|---|---|---|---|---|
| **Gathurst (mp 326/0A)** | M6 | 7252A | STRONG WINDS SLOW DOWN | 7252A | 50 |
| | | 7265B | STRONG WINDS SLOW DOWN | 7265B | 50 |

Resources

The resources required to put the high wind plans into place are the responsibility of the individual organisations.

Communications

All communications will be via the NWRCC.

Health & Safety

Health, safety and welfare must be of paramount concern for all organisations in implementing this protocol.

Administration

The decision making process will be recorded on the command and control system in the RCC.

### 5.2.5 Heavy rain

5.2.5.1 Pumping, jetting and clearance techniques

Due to the size and varied geographical layout of the Area 10 Network severe weather events and their impact can vary greatly. Low lying land can become inundated with surface water therefore slowing drainage flows from carriageways. Carriageway closures due to flooding can cause severe congestion across the Area 10 Network.

If a flash warning for heavy rain or flooding is issued by the Met Office, NILO or the Environment Agency, BBMM will request that additional resources be made available from various stakeholders throughout the event. Early warning to supply chain sub-contractors is essential to mitigate any adverse effects. In addition the Traffic Officer Service, Local Authorities and Police Forces are informed of the impending conditions to enable them to make necessary arrangements prior to the onset of prolonged wet weather.

Recurrent flooding problems are resolved by identifying renewal or improvement schemes and securing funding either from the Non Lump Sum Routine Maintenance budget or through the Roads Renewal budget where proposals need to go through the value management process.

All drainage defects are recorded using [redacted] These are filed under RMMS surveys and can be accessed via the Network Asset Defects tab.

This list has been compiled based on historic trends and records of flooding incidents and those locations potentially leading to flooding on the trafficked network.

BBMM will follow the guidance in AMM122/10 to improve their management of flooding risk, This AMM gives details of the new Flood Register now located within [redacted] and includes instructions on how it must be used; it includes a map showing locations considered especially prone to flooding and gives guidance on contingency planning measures to be adopted to plan

for future flood events. Guidance is also given on the need to liaise with the newly appointed Contingency Planning teams and what physical measures will be implemented to reduce flood risk, and how these may be identified and designed. It also gives guidance on appropriate responses to flooding events.

In addition, the Watchman section of the Programme Delivery Team keep a record of all known or recorded flooding instances on the Network. These are assessed and where possible actions are taken to complete schemes to relieve the problem in accordance with PMF 5.3d & 5.3e.

Areas that have been prone to flooding are recorded in the Vulnerable Locations in Appendix A.18.

5.2.5.2 Operational considerations

**Identification of flooding**

- Flooding which is identified by any source will be dealt with in accordance with the Incident Response Plan.

- Flooding notifications received from HAIL, Police Forces, Local Authorities, Highways Agency Traffic Officer Service and Flood Forecasting Centre are key to identifying areas of flooding. Timely and accurate information received from stakeholders speeds up response times and reduces the impact on the network.

**Primary Response to Flooding**

- The NCC upon receiving notification of potential flooding will despatch a MRT vehicle to assess the situation.

- Where ever possible the MRT will take immediate action locally with the aim of clearing debris and making the area safe for the travelling public. If required sand bags can be provided to channel water away from the carriageway.

- Where flooding occurs adjacent to soft ground MRT crews will cut a temporary drainage grip by hand. This has the effect of channelling flood water away from the carriageway.

- MRT vehicles are equipped with spillage kits which include absorbent booms and pads.

- MRT vehicles are also equipped to carry traffic cones allowing emergency traffic management to be provided with minimum delay.

- If the MRT team cannot rectify the situation additional resources can be called upon from various sub-contractors.

**Secondary Response to Flooding**

- High Pressure Water Jetting can be used to clear blockages to carrier drains, cut off drains and adjacent land drainage.

- High Pressure Water Jetting can also be used to clear thatching or compacted blockages from culvert grilles and/or trash screens. This is very effective if working upstream from a downstream location.

- If required pumps can be used to remove excessive flood water. It is important that the water pump has somewhere to discharge too that will not create a secondary flooding problem. In such cases a local water course, river or body of water must be identified.

- Dredging or suction pumps can be used to remove silting to catch-pit areas and open chambers.

- If required the Fire Service can be called upon to provide high volume water removal pumps to clear large volumes of flood water.

- If the flood water is also polluted specialist environmental cleanup contractors can be called to remove pollutant materials from entering adjacent watercourses or damaging the network asset.

Where additional Traffic Officer or Police support is required this is requested by contacting the NCC.

**Escalation**

Serious flooding incidents which reduce overall lane capacity are likely to create journey time delays. The MRT (if they are in primary control of the scene) will notify the NCC who will advise the RCC who will in turn update NTIC and NILO.

Where a route becomes impassable or becomes congested the RCC will set diversion routes around the network as required with the use of VMS. BBMM will assist in the hiring in of portable VMS & their deployment if instructed by the Service Manager. Media liaison, managed by the RCC, can also be used to advise motorists and reduce congestion.

Severe Weather events will be managed by each respective area team and contingency plan arrangements must only be enacted if the planned response is insufficient to cope with exceptional weather conditions, or if an incident is compounded by a series of further incidents. Emergency welfare arrangements are detailed within the BBMM Area 10 Contingency Plan.

**Severe Weather Warning for Heavy Rainfall**

If the Met Office or Environment Agency issue a severe weather warning for Heavy Rainfall the following actions are taken;

- The Network Manager will be advised.

- Bronze and Silver Duty Managers will be informed. If required, a Silver Manager will attend the NCC to direct operations throughout the event.

- During heavy rainfall Duty Supervisors, Inspectors and MRT crews will continue to monitor the network and report flooding to the NCC.

- BBMM also regularly check [redacted] website and review any Severe Weather Alert along with information from the Flood Forecasting Centre.

- Where flooding does occur and it is a danger to the public the MRT crews will respond in accordance with the Incident Response Plan.

**Non immediate reoccurring flooding resolution**

If the cause of flooding is not resolved by the above methods then further investigation, pipe proving or outfall cleaning will be undertaken by the Network Teams. If minimal or responsive works are required this will be undertaken as routine works.

If a more detailed or planned solution is required the HA are appraised of the situation and a study scheme is developed. Findings from the study will then be presented to HA for consideration for funding. This is suitable for schemes that can be delivered quickly and have an immediate impact and prevents the recurrence of flooding.

A periodic review of incidents is undertaken by the AMOR & Asset Teams to identify any areas of flooding that have occurred in the previous 24 hours and the actions taken. Trends are identified and investigated and remedial works are planned as appropriate.

Other than water courses and rivers adjacent to the flooding incident there are no areas within the Area 10 network where flood water can be pumped to.

A detailed schedule of supply chain partners capable of providing high volume pumps and specialist jetting equipment can be found in the Area 10 Network Control Centre Emergency Response Plan.

5.2.5.3 After care and follow up treatments

BBMM will divert resources as they become available for follow up and after care treatments of footways, cycle tracks, lay bys and side roads etc. Details relating to flooding incidents are recorded on the NCC [redacted]ncident database. This information can then be used by AMOR, Asset or Program Delivery Teams to identify if any further actions are required.

Additional surveys or investigation works may be required. This can include CCTV surveys or bore hole investigations.

### 5.2.6 Fog

BBMM will undertake the following specific measures as appropriate to mitigate the hazard:

- Where available fixed or mobile VMS should be used to warn road users of the hazard. The existing established procedures for requesting VMS settings to be made should be followed well in advance. The following legend is currently the most appropriate to use – 'FOG SLOW DOWN'. This will require arrangements and protocols to be established with the appropriate RCC.
- National Incident Liaison Officer (NILO) and/or Highways Agency Press Officer should be contacted in order that the local media can be advised as necessary.

- Where available use of variable mandatory speed limits should be considered. This will require arrangements and protocols to be established with the appropriate Police Control office or RCC as part of the advance planning procedures.

Due to the varied geographical layout of the Area 10 network Fog can occur at any location across the network and can be very localised. Low lying land farm land areas are particularly susceptible to dense Fog while urban areas are rarely affected. If fog is forecast or detected close liaison with the RCC control room will take place at the earliest opportunity. The above mentioned VMS protocol and liaison methods will be initiated to warn motorists of the potential reduced visibility.

### 5.2.7 High temperatures

In the event of high temperatures where vehicles and occupants are static on the motorways and trunk roads for long periods of time, BBMM will provide support and assistance to the RCC and the Police as requested.

The BBMM Area 10 Contingency Plan details the provision of welfare facilities and materials. It is to be used in conjunction with the Area 10 Severe Weather Plan to ensure a robust defence against dealing with Heat Wave Severe Weather incidents.

In the event of prolonged high temperatures some carriageway materials can start to lose cohesion, this is highly unlikely on the strategic road network and is more prone to local authority roads have been surface dressed and suffer from weeping (Exposure to direct sun light can result in joint or seam sealers becoming tacky and in some cases reverting back into a viscous liquid).