Winter Service Operational Plan (WSOP) – 2023-24 (V1 – October 2023)

Sponsor: Steve Johnson

Author: Ross Bevan

Community: Environment and Infrastructure

Plan No: Herts-Winter Plan 23-24 (v1 – October 2023)

Ringway Statement of Intent

Ringway are the principal contractor for Hertfordshire County Council Highways Services Term Contract.

Purpose:

This Winter Service Operational Plan (WSOP) is a statement of intent to ensure that the management of the Contract delivers the Client's requirements and those of BS EN ISO 9001:2015. It is a unique working document to provide guidance and direction for the effective management of the winter maintenance service for the above Contract.

The Winter Service Operational Plan identifies those practices, resources, activities, controls and procedures to be used on the Highways Works Contract to deliver customer satisfaction and comply with the corporate management system.

Agreed by: …… Date: ……...

Hertfordshire County Council – Head of Contracts & Network

Agreed by: ..... Date: …….

Hertfordshire County Council – Assistant Network Manager

Agreed by: ..... Date: .....

Ringway - Operations Manager

Approved by:..... Date: .....

Ringway - Performance Manager

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Figures

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Record of Review / Revisions

This management plan shall be reviewed during the summer period (between winter maintenance periods) and updated accordingly. The reviews, including nil returns, shall be noted below.

Date	Topic of Change	Section(s) Changed	Rev No.	Approved	Agreed
May 17	Updated for 2017-18 season	Review and minor amendments to sections; 1.0, 5.1,6.1, 6.2, 6.2, 6.3, 8.0, 8.1, 10.0, 11.2, 11.3, App B, C, D & I.	Blank	RS	JP/SJ
Sept 17	Updated to include signature for Head of Contracts & Network	Front page	Blank	RS	RS/SJ
May 18	Updated for 2018-19 Season	HCC Section – 1.3 Governance updated, Ringway - see page 13 for revision details.	Blank	RS	RS/JP/ SJ
May 19	Updated for 2019-20 season – Changes to intervention level for gritting from 1.0 to 0.5 Degrees		Blank	RS	RS/JP/ SJ

July 19	Updated to reflect new Golden Thread/Corporate Values		Blank	RS	RS/SJ
May 2020	Updated for 2020-2021 winter season		Blank	RS	RS/SJ
Nov 2020	Updated for 2020-2021 winter season to reflect changes for Covid and amend appendix errors	Criteria, route maps, updated links, new bullet point at 1.3	Blank	RS	RS/SJ
May 2021	Updated for 2021-2022 Season	Date changes to 2021 – 2022 only	Blank	RS	RS / JP / SJ
August 2022	Updated for 2022-2023 Season	Date changes to 2022 – 2023 only	Blank	SJ	
June 2023	Updated for 2023-2024 Season	Date and lead officer change, update to table 8.1	Blank	RB/SJ	

Register of Controlled Copies

Copy No	Holder	Company / Organisation	Location	Rev & Date of First Issue
N/A	Performance & Quality Manager	Ringway	Master copy on site intranet / network shared drive	Original date of publication Rev 2 30/8/16 Revised date V2 November 2020
1	HCC /ITCC	Blank	Hard copy with HCC Winter Lead Officer	Blank

Revision History

Issue	Date of Issue	Details
0.1	Sept 12	Plan prepared
0.2	Jul 13	Plan reviewed by Wendy Walker and sent to Barrie Lee/ Chris Martin to read through and complete the appendices
0.2	Mar 13	Addition of appendices and first publication
0.3	May 17	Review and minor amendments to sections; 1.0, 5.1,6.1, 6.2, 6.2, 6.3, 8.0, 8.1, 10.0, 11.2, 11.3, App B, C, D, E & I.
0.4	Jun 17	Section 4.0 Page 17 priority 3 box deleted in error reinstated,
0.5	May 18	Section 1.0 Page 15 reference to “Well-Managed Highways A code of Practice” added. Section 4.0 new criteria for road priorities inserted. Section 6.1 minimum salt levels changed to reflect contract and wording clarified, references to appendix corrected to 439/6 and salt bin policy on website removed. Section 6.4.1 Forecast references and times updated. Table X updated. Morning summary changed to morning forecast. 7.1 reference to Appendix F removed. Section 8.1 table updated. Section 8.1.13. 8.1.10 wording clarified in right column notes. Page 45 Schools treatments updated. Section 11.6. 11.3 Exec Member and Officer details updated. Page 49 timetable updated. Appendix B amended for current year, duty officer details removed as in section 11.2. Appendix C link updated. Appendix D spelling corrected. Appendix E in right column notes in right column notes. Letter dates amended for current year. Removal of appendix F. Appendix G new route information and maps added.

0.6	May 19	Page 38 Intervention level changed from 1.0°C to 0.5°C, dates updated to 2019/22020 throughout document
0.7	July 19	Document updated throughout to reflect changes to new intervention levels and new dates for winter 2019/2020 season.
0.8	May 2020	Document updated throughout to reflect new dates for winter 2020/21 season.
0.9	November 2020	Gritting criteria updated to reflect changes to allow for gritting to Covid Test and Vaccination centres. Appendices updated A to G, with new appendix F. Grammatical errors corrected. (need to update section numbers). Criteria updated, varying of plan updated. Other sections updated 2.0 mileage change, 5.1 snow desk, 6.2 bagged salt, 6.3 gritter fleet, 6.4.1 forecast times, 7.2/7.3 flow chart references, 8.0 reference, 8.1.12 boundary agreements, 8.1.9/8.9.11 police reports of ice and contributory accidents, 8.1.12 schools, 11.2 structure, 11.7 review timescales and appendix A depot info.
0.10	May 2021	Document updated throughout to reflect new dates for winter 2021/22 season.
0.11	August 2022	Document updated throughout to reflect new dates for winter 2022/23 season.
0.12	June 2023	Document updated throughout to reflect news dates for winter 2023/24 season, HCC lead officer changed. Table 8.1 updated to include ‘Standby at Home’ guidance. Minor formatting.

1.0 Policy

There are two elements of legislation that relate to the provision of a Winter Maintenance Service in England and Wales:

1. Section 41 (1A) of the Highways Act 1980, which was modified on 31st October 2003, by Section 111 of the Railways and Transport Act 2003. The first part of Section 41 now reads:

   a) The authority who are for the time being the highway authority for a highway maintainable at the public expense are under a duty, subject to subsections (2) and (3) below, to maintain the highway.

   b) (1) In particular, a highway authority are under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice."

   This is not an absolute duty, given the qualification of "reasonable practicability" but it does effectively overturn previous legal precedence, albeit not with retrospective affect.

2. Section 150 of the Highways Act 1980 still imposes a duty upon authorities to

3. remove any obstruction of the highway resulting from *"accumulation of snow or from the falling down of banks on the side of the highway, or from any other cause"*.

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

The plan must also comply with the general duty imposed by Section 41 of the Highways Act 1980: to maintain those highways maintainable at public expense in a safe condition.

Hertfordshire County Council therefore undertake to provide a winter maintenance service which, as far as reasonably practical, will permit safe movement of traffic and minimise delays and accidents directly attributable to adverse weather conditions.

Every employee who is involved with delivering the winter maintenance service shall be fully acquainted with and have access to this plan.

Guidance has been taken from “Well-Managed Highways A Code of Practice” and NWSRG practicable guidance where appropriate for Hertfordshire’s resource arrangements.

This plan will also take into account any national or local restrictions in relation to a pandemic or civil emergency.

2.0 Scope

This Plan describes the winter operational service for Hertfordshire County Council’s 5000-mile road network. It is compiled in conjunction with the contract requirements and covers all elements of the service.

The arrangements include utilising personnel and plant to enable precautionary and post salting of the network in accordance with specified response and treatment times.

3.0 Responsibility

HCC Client manager (Assistant Network Manager - Strategy) / Winter Service Manager - To establish Policy, Scope and remit and to manage all aspects of the Winter Maintenance Service.

Ringway – to provide efficient and effective winter maintenance service which, as far as possible, allows the safe movement of traffic on Hertfordshire County Council's road network, keeping delays and accidents caused by adverse weather conditions to a minimum. Ringway are also responsible for updating the winter maintenance plan (WSOP).

Duty Officer – HCC Officer responsible for monitoring weather forecast information to make informed winter maintenance action decisions.

Ringway Winter Service Manager – Ringway staff member with responsibility to ensure sufficient operational resources are available to deliver the winter maintenance service as laid out in this plan.

District & Borough Councils - to provide additional manpower for the clearance of snow and ice from specified footways as requested and defined by the Duty Officer, where reasonable and practical.

Volunteer and resident groups (Self Help) - To distribute bagged salt to localised hotspots on the Highway network, where reasonable and practical.

Farmers - to provide additional snow clearing services on rural roads as requested and defined by the Duty Officer, where reasonable and practical.

Communications Coordinator - under extreme or prolonged severe weather conditions a communications coordinator (who may be from HCC or Ringway) will have direct responsibility for logging and recording communication during the period as directed in Section 7.0.

4.0 Operational Periods and Priorities

4.1 Operational Periods

The winter maintenance season runs from 1st October to 30th April, but may be altered should conditions dictate. The season is divided into three main periods as shown in the table below. In the low periods (October and April) only half cover service will be provided due to the reduced risk and severity.

Period	**Months**	**Winter Conditions**
High	December, January, February	Severe – Probable
Medium	November, March	Severe – May occur
Low	October, April	Severe – Not expected

4.2 Route Priorities and Risk

Winter maintenance operations are geared to the safe movement of traffic. To ensure operations are effective, priorities are identified using a risk-based approach where the relative importance of roads and footpaths is identified according to their level of risk, as show in the tables below. For example, higher risk levels are associated with higher volumes of traffic, faster speed limits, and the vulnerability and types of road users. It must be noted that should national salt shortages or other weather and operational conditions dictate, a reduced network may be adopted (resilience network). This is included in the table below. Roads not indicated by any priority will be treated as and when resources are available.

1. Hertfordshire's Road Priority description (revised 2018-2019 / updated November 2020)

Table 1 Road Priorities

Priority Number	**Criteria for inclusion**	**Included on Resilience Network**
Priority 1 (Red) / Primary	A and B Roads, Routes to Hospitals, Urgent Care Centres and Doctors surgeries (where accessible) plus designated emergency service routes, transport interchanges and train stations, both in county and on boundaries, airports near to county boundaries. Covid Test/Vaccination Centres, as advised by Hertfordshire Public Health, all where practical and accessible.	Yes

Priority Number	Criteria for inclusion	Included on Resilience Network
Priority 2(a) (Red) / Primary	Scheduled bus routes with at least one service an hour on more than one day, School bus routes using normal sized coaches, and a route up to a school entrance. One road into each village of 50 houses or more, roads linking rural communities or key infrastructures and industrial areas. All where practical and accessible.	Part
Priority 2(b)(Red) / Primary	Gradients 10% and over (where recorded), promoted facilities including libraries, community centres and care homes, key pharmacies, critical utility infrastructure and off road paved designated cycle-ways. All where practical and accessible.	No
Priority 3 (Blue) / Secondary	Other roads with steep gradients in urban and residential areas, rural roads with poor drainage. Remainder of the road network where running or standing water is a hazard. All where practical and accessible.	No

Priority Number	Criteria for inclusion	Included on Resilience Network
Resilience Network (Subset of Priority 1 and part of Priority 2 (a) - Gritted when required to reduce network due to government salt cell instruction.	A and B Roads, Routes to Hospitals, Urgent Care Centres and Doctors surgery's (where accessible) plus designated emergency service routes. Transport interchanges and train stations both in county and on boundaries, airports near to county boundaries. Covid Test/Vaccination Centres, as advised by Hertfordshire Public Health. Scheduled bus routes with at least one service an hour on more than one day, one road into each village 50 houses or more, roads linking key infrastructure and industrial areas. All where practical and accessible.	Yes

Note: Roads/sections of road will only be included where they do not require access to third party land or for third party arrangements to be put in place to make them practical and accessible.

Table 2 Footway Priorities

Priority number	Description
1. High Traffic (HCC High priority*) *Footways identified during Network review process June 2010	Town and City centre outside local community shops plus footways linking transport interchanges, footways outside Covid Test/Vaccination centres.

Priority number	Description
2. Medium Traffic (HCC High priority*) *Footways identified during Network review process June 2010	Busy Urban footways leading from housing estates to town and city centres. Frequently used public amenities. Main streets in villages
3. Low traffic (High Risk)	Housing estates with high incidence of defects due to age of footway, extensive utility trenches or vandalism lengths where there are significant high numbers of vulnerable users e.g. outside old people's homes
4. Low Traffic-Urban	Housings Estates and other urban footways
5. Low Traffic Rural	Little used rural footways

*Footways identified during Network review process June 2010

5.0 Organisational Arrangements

In all cases sufficient labour, plant materials and other resources should be provided to ensure that treatment of the network can be completed within the timescales set out in the Highways term contract. More information on the resources available can be found in Section 6 of this plan.

Operations will be carried out from the four depots located at South Mimms, Kings Langley, Stevenage (Corey's Mill) and Ware (Hoe Lane), using specialised plant and equipment. Appendix A shows the locations of these four depots. Each depot has fully covered salt storage facilities. Personnel resources will be provided and a full list of nominated individuals for the current season is included in Appendix B.

Should any of these depots be unavailable then salting operations will be run from other Depots, under emergency planning arrangements as directed by the HCC Client Manager and the Winter Service Manager (Ringway).

HCC Client manager / Winter Service Manager – The Assistant Network Manager.

HCC Duty Officers – will be appointed trained HCC staff and they will operate on a rolling schedule.

Ringway Winter Services Manager – will be appointed by Ringway to oversee and co-ordinate winter maintenance operations.

Ringway Winter Maintenance Supervisors – will be appointed by Ringway to coordinate depot response to Winter Maintenance activities.

Ringway Winter Maintenance Operatives – sufficient trained and competent operatives are to be available to fulfil service requirements. They are trained to City & Guilds Winter Service Operations – 6159.

In order to provide the required response to weather conditions, we will operate a combination of standby at home and standby at the depot in addition to the normal and continuous working shifts.

Duty Schedules and Standby Rotas will be published centrally in the Integrated Transport Control Centre (ITCC) at County Hall. The definitions of operational staff rotas:

Call Out	Off duty personnel available for duty as demand arises but without any prior commitment to be available.
Standby	Personnel committed to be available to report to the depot or direct to a route within 1 hour of being called out from elsewhere or home.
Normal shift	Personnel on duty at the depot or at a workplace during normal working hours.
Continuous shift	Personnel on duty at the depot on patrol, gritting or ploughing route.

5.1 Snow Desk

During severe weather conditions or a period of salt shortage, a jointly manned severe weather event team “Snow Desk” will be established either virtually or in the Integrated Transport Control Centre (ITCC) in County Hall, Hertford, where the Ringway Winter Service Manager or Deputy will be present. During severe conditions, the police may request that the control desk be set up at Police HQ where a Duty Officer will also be present. National Highways may also have a Snow Desk representative at Police HQ. It must be noted that if conditions dictate, remote outstations/working can be employed.

HCC Client manager (or if delegated: the Duty Officer) will take full operational control of all activities and will be the lead member of the team. They will select and mobilise the team required to assist in manning of the Snow Desk.

The snow desk will include:

- Duty Officer
- HCC Network Manager / Winter Service Manager
- ITCC Manager
- Ringway Winter Service Manager
- Communication coordinator
- HCC communications team representative

It can also include but is not limited to:

- Representative from blue light services
- HCC Resilience team
- Public Health or NHS
- District / Borough partners

This team will meet at an agreed time in line with operational circumstances.

Snow desk duties at the ITCC, at police HQ, or remotely, will include liaison and joint operations in support of blue light services. Closed circuit TV in the ITCC, across the National Highways network and via borough/district CCTV systems will be used to establish extent and disruption of any snow fall and to coordinate snow clearance and spreading operations.

Their responsibilities will also include agreeing communications in line with the winter communications plan and incident management protocol, conference calls to district and borough partners, stock assessment, weather conditions, current forecast and current Network Impact.

5.2 Treatment and Response Time

Treatment routes and shift arrangements have been organised to achieve defined standards of response and treatment times on the specified network highway hierarchy.

Our operational standard is that it is essential to maintain free flow on the major routes to minimise delay and unsafe conditions. These routes will also provide arterial network to enable plant and equipment to reach lesser priority roads when necessary.

Response Time: Is defined as the time taken from the decision to begin precautionary treatment until the winter maintenance vehicles are loaded, manned and ready to commence actual salting.

Treatment Time: Is defined as the time as the time taken from the start of the route and beginning treatment of the network through to completion of the treatment, this will be determined using the vehicles tracking system.

Response and treatment times are detailed in tables 4391/1 and 2 in Schedule 5 to The Contract, as updated by any contract note.

The response time takes account of the distance between home and depot for many of the salting crews and the time taken for the decision to reach all the crews. The treatment times takes account of the lower speeds, general road layout and other traffic, and is a balance between a longer period using larger but fewer vehicles and a shorter period using smaller but more vehicles

An Operational Situation Report for every route and action will be completed by 0800 each day throughout the winter operational period and sent to the HCC Client manager.

This report will be stored and held according to the table in section 10.

6.0 Plant, Vehicles, Equipment, Material and Resources

6.1 Salt and stocks

Fine Rock Salt to BS 3247:1989 (minimum 6mm) shall be used with a Safecote additive as the prime material for combating snow and ice.

SA NAMAS approved laboratory will be used when any Salt Certification is required. Each certification will be forwarded to Hertfordshire County Council. Certificates will be provided for every 500 tonnes of salt supplied. A regular moisture content test should be undertaken in line with Chapter Four of the NWSRG Winter Service Practical Guidance.

Salt will be supplied by Compass Minerals.

Salt Union Ltd, De-Icing Business, Winsford Rock Salt Mine, Winsford, Cheshire, CW7 2PE

Salt stockpiles will be stored under covered salt barns at the four Winter Maintenance Depots. Additional salt for footway clearance and for use in severe weather events will also be stored at District and Borough locations. Additional salt may also be stockpiled within other locations provided by Ringway.

The required contract commencement maximum and minimum salt stock levels (during each winter service period) shall be maintained as directed in Appendix 439/6 of Schedule 5 of The Contract.

Guidance on Determination of Minimum salt stocks

Table 3 Minimum Salt Stocks

Routes	**Normal Salting Network (Tonnes/Run)**	**Minimum Salting Network (Tonnes per run)**	**Pre-Season Stock. Precautionary Salting Network (12 days /48 Runs)**	**Core Winter Period stock Minimum Network (6 days 36 Runs)**	**Overall Winter Period Minimum Network (3 Days 18 runs) when specified**
Precautionary Network	300	132	14400	10800	2376
Secondary /Footways	200	0	400	200	200
Salt Bins	300	0	300		
Bagged salt	100	0	150	100	100
Total	900	132	15250	11,100	2676

Using Well-Managed Highway Infrastructure Code of Practice guidance, HCC absolute minimum stock levels are as below*.

1st Oct -30th Oct 14440 Tonnes

1st November 14440 Tonnes

1st November- 1st March 10800 Tonnes

1st March – 30th April 3390 Tonnes

***It must be noted that the calculation is based upon a 15g spread rate as this is HCC "heavy spread rate". Contractual levels are well above this determination.**

Salt stock reconciliation will be achieved using monthly physical reconciliation and comparing this with weighbridge measurements, taken as spreaders leave and return from the depots, to ensure that minimum and maximum levels as in the above table are maintained.

The Winter Service manager (Ringway) will order and arrange delivery in line with these minimum levels set out in table above. Weekly reports will be made to the HCC Client manager of stock holdings.

For the purposes of stock control, a mean density of 1.3 tonnes/m³ will be used.

Salt will not be stored:

- above the top of the concrete retaining walls (3m high);
- more than 6m high at the peaks;
- in such a manner that the working face is less than 60° to the horizontal, to avoid the creation of steep faces liable to collapse.

Moisture Content should be within an optimum range of 2-3.5%

Salt will be loaded over the sides of the spreaders by front end loading shovels until the required amount of salt is loaded to suit the gritting route.

6.2 Salt Bins and Bagged Salt

Salt bins are provided in over 1000 locations across the county for 'self-help' during icy highway conditions.

These bins will be refilled at the beginning of the winter season and after a prolonged snow or ice period. An electronic record will be kept of each bins location and latest fill, missing/ damaged bins will be replaced prior to the season and during the season as resources allow. The location of all salt bins can be found at webmaps.hertfordshire.gov.uk/highwayspublic/

Bagged salt will be provided for District, Parish and Town Councils as well as schools, Covid test and vaccination centres as advised by Hertfordshire Public Health, and Community and resident groups subject to approval of the local County Member. The HCC Client manager and Ringway will liaise with these partners and produce list of deliveries prior to the High-risk winter period 1st December. Each delivery will be on a one-off basis with restocking only considered in the most severe conditions and if resources allow. Applications will not be accepted after 31st October other than from a District or Borough Council or test or vaccination centre.

Details on how to apply can be found at www.hertfordshire.gov.uk/winterroads

6.3 Vehicles and Equipment

The following specialist gritting vehicles for delivery of the service are listed below. All spreaders will be fitted with snowploughs when required.

Stevenage cycleway gritter and 4x mini gritter.

The spreaders will be fitted with equipment that complies with the requirements of BS 1622:1989 and Highway Works Term Contract. Calibration procedures and testing, shall be completed before October unless otherwise agreed with Hertfordshire County Council. The spreader and coverage testing for all Spreaders will be undertaken by Econ Engineering Limited to ensure capability of symmetrical and asymmetrical spreading in accordance with Well Managed Highway Infrastructure: Code of Practice requirements.

Calibration procedure:

Calibration should be carried out for every spreader in the fleet and will check:

1. That the total amount of salt being discharged is within acceptable tolerances
2. That the salt is being spread to the target area.

Calibration should always involve a direct measurement of the amount of salt being discharged and where it is being spread.

Calibration must be carried out by a competent and trained person.

Snowplough blades shall be adjusted so that the wearing strips are within 10mm of the road surface over the whole length of the blade. Any damage or worn wearing strips will be replaced or turned as a matter of routine. Snow ploughs and wearing strips shall on every occasion of use be checked, adjusted and repaired as necessary for optimum performance.

All winter operational vehicles will have an appropriate testing and calibration certificate available for inspection.

All vehicles and winter operational equipment will be maintained by Ringway.

All other Spreaders will be mechanically maintained by Econ Engineering Limited.

Econ Engineering Limited, Boroughbridge Road, Ripon, North Yorkshire, HG4 1UE
Tel: (redacted text)

All Contact, Maintenance, Breakdown and Hire arrangements for contract plant should be initially obtained from the Ringway Fleet & Plant Department.

For the attention of (redacted text), Divisional Plant and Fleet Manager, Ringway Infrastructure Services, Corey's Mill Highways Maintenance Depot, Hitchin Road, Stevenage, Herts, SG1 4FD.Tel – (redacted text).

Drivers' qualifications

All drivers have undertaken units from the relevant City and Guilds qualifications.

Both the Winter Service manager and the HCC Client manager are unit 21 qualified.

Cycleway treatment equipment

On every precautionary treatment the agreed cycleway network (as defined in section 4.2 Road Priorities) will be treated. The response time will be as for precautionary treatments.

Footway salting equipment

Salting of High priority footways for the removal of ice and snow will be carried out using a mix of resources. Each operational depot will provide sufficient works vehicles with salt, shovels and brooms for allocation as required.

6.4 Weather Prediction

- A full Winter Weather forecasting service will be provided throughout the winter service period (1st October to 30th April inclusive) by METEOGROUP Ltd:
- For the attention of, The RoadMaster Manager, DTN (METEOGROUP Ltd), 292 Vauxhall Bridge Road, London, SW1V 1AE
- The Weather recording system, Findlay Irvine ICELERT, will be provided and maintained by Findlay Irvine.
- For the attention of , Director of Sales. Findlay Irvine Limited, 42 / 44 Bog Road, Penicuick, Midlothian, Scotland, EH26 9BU
- There are twelve weather-recording outstations located on the Network including four forecast outstations. These are detailed in the on the following page.
- Surface sensors will be cleaned pre and mid-season or when required (HCC duty officer may request additional cleaning as required). An indication of salt concentrations on the road surface should be used only as a guide in the decision-making process.

Table 4

Site Ref.	**Site Location**	**O/S Grid Ref.**
A505-LL	A505 Lilley	TL 126 263* (indicates forecast outstations)
A120-BST	A120, Bishops Stortford	TL 486 233* (indicates forecast outstations)
B136-BGH	B1368, North of Hay Street, Braughing	TL 393 268* (indicates forecast outstations)
A119-STP	A119, North of Stapleford	TL 310 173

Site Ref.	Site Location	O/S Grid Ref.
B487-HH	B487, Redbourne Road, Hemel Hempstead	TL 093 107
B488-TRG	B488, New Mill, Tring Wharf	SP 927 131* (indicates forecast outstations)
A4147-HH	A4147, Maylands Avenue, Hemel Hempstead	TL 077084
U53-OFF	U53, School Lane, Offley, Bridge Deck Site	TL 141 275
A41-CR	A41 Cow Roast	SP 953 097
C183-HC	C183 (Old A10) North of High Cross, near Barwick	TL 366194
A505-BB	A505 Baldock By-pass tunnel entrance	TL 525232
A10-RE	A10 Reed Northbound	TL 357364

* indicates forecast outstations

Frequency and intensity of forecast information

Table 5

Field	Frequency	Data Intensity
Morning Summary	By 6:00 Daily	Single field
36 Hour Forecast (Text)	Operational Winter Period: by 06:00, 12:00 ,18:00 and 21:00 Daily Operational Summer Period: by 06:00 Daily	Single field
36 Hour Forecast (Domains)	Operational Winter Period: by 06:00, 12:00 ,18:00 and 21:00 Daily Operational Summer Period: by 06:00 Daily	For each domain, daily

2-5 and 6-10 Day Forecast	Operational Winter Period: by 06:00, 12:00 ,18:00 and 21:00 Daily Operational Summer Period: by 06:00 Daily	Day 2 to 5 – Area based, daily Day 6 to 10 – Single Field
Site Specific Forecast	Operational Winter Period: by 06:00, 12:00 ,18:00 and 21:00 Daily Operational Summer Period: by 06:00 Daily	For each domain, hourly.
2 Week Forecast	The following 2 weeks	See below
4 Week Forecast	The following 4 weeks	See below
24hr Consultancy Service	24/7	See below
24hr Monitoring Service	24/7	See below
Statistical Analysis	End of month	See below

The forecast parameters will vary between the Operational Winter and Summer Periods. The table below details which forecast parameters are to be provided.

Table 5

Forecast Parameter	**Winter**	**Summer**
Minimum road surface temperature	Yes	No
Maximum road surface temperature	No	Yes
Minimum air temperature	Yes	No
Maximum air temperature	No	Yes
Dew point / Relative humidity	Yes	Yes

Surface state	Yes	No
Wind speed (various) - in MPH including timing at 1.0m.	Yes	Yes
Wind direction	Yes	Yes
Accumulations of snow (depth)	Yes	No
Visibility expressed in meters	Yes	Yes
Snow level (height above sea level)	Yes	No
Hazard – Ice	Yes	No
Hazard – Heavy Rain	Yes	Yes
Hazard – Freezing Rain	Yes	No
Hazard – High Temperature	No	Yes
Hazard – Hoar frost	Yes	No
Hazard – Fog	Yes	Yes
Hazard – Snow- intensity	Yes	No
Alert Level - define parameters	Yes	No

Note:

All forecasted temperatures should be stated to one decimal place.

Decision makers will be able to use the weather forecasting services from any smartphone or tablet.

36 Hour Forecast

The 36-hour forecast consists of two parts: a 36-hour text forecast and a domain forecast in tabular format. During the Operational Winter Period, a detailed 36-hour text forecast and a domain forecast should be updated and delivered by 06:00, 12:00, 18:00 and 21:00 daily.

During the Operational Summer Period a detailed text and domain forecast shall be updated and delivered daily by 06:00 covering the period from 06:00 to 06:00.

Additional optional elements can be included at the request of Service Providers. This may include:

- Extension of forecast periods from the forecast issue time up to thirty-six hours ahead.

Text Forecast

The 36-hour text forecast will be valid for the ensuing 36-hour period from the prescribed issue time.

The text of this forecast must include:

- Headline weather description
- A general synopsis, with timings, over the following 36 hours, including:
    - Summary of the meteorological synoptic situation with timings of significant meteorological changes during the forecast period with particular reference to hazards such as snow, ice, hail, hoarfrost, freezing rain (including super cooled and rain falling on frozen surfaces), wind, fog, lightning and rain/showers which are expected to affect any of the agreed HAWIS forecast domains.
    - Expected road surface conditions indicating whether roads are likely to be dry or wet.
    - Onset, duration and intensity of hazards such as rain, hail, sleet, snow, rain falling on frozen surfaces and freezing rain, including potential accumulations of snow on road surfaces described in centimetres (assuming no treatment has been undertaken).
    - Relative humidity and dew point, including a warning of any predicted combination of low temperature and low humidity conditions (less than 80% winter, 60% summer).

- The likelihood and timing of any precipitation or deposition on road surfaces and the likelihood of surface water on the carriageway depth).
- If snow is forecast, its timing, amount and type and the direction from which the snow will develop, the likelihood of drifting and the height above which accumulation is likely.
- Visibility – danger of thick fog (<1000 m visibility) or freezing fog formation, the location and timing. distance expressed in meters
- Average wind speed at 1.0m, direction and maximum gust speed at six-hour intervals (between 06:00 - 18:00 and 3hr intervals between 18:00-06:00) from the time of forecast.
- General confidence level in the forecasts (low, medium or high)
- General alert level (as detailed in the table below)

Table 6 Hazard Table

Hazard Level	**Hazard Explanation**
Level 0 (Green)	There are no expected hazards on the road surface and road surface temperatures are expected to be above +1.0°C when confidence is high or above +2°C for all other occasions.
Level 1 (Amber)	• Road surface temperatures are expected to be between +0.5°C and +1.5°C when the confidence is low. • Road surface temperatures less than or equal to +0.5°C and greater than or equal to zero. • Road surface temperatures below zero but road surfaces are expected to remain dry.

Hazard Level	Hazard Explanation
Level 2 (Red)	Road surface temperatures are expected to be below zero and road surface hazard(s) exist. Road surface hazards include ice, snow, freezing rain and hoar frost.

Domain Forecast

The domain forecast will have a variable validity period as follows:

Winter Operational Period

- 06:00 domain forecast validity period will be 06:00 to 06:00 (24 hours)
- 12:00 domain forecast validity period will be 12:00 to 12:00 (24 hours)
- 18:00 domain forecast validity period will be 18:00 to 06:00 (12 hours)
- 21:00 domain forecast validity period will be 21:00 to 06:00 (9 hours)

Summer Operational Period

- 06:00 domain forecast validity period will be 06:00 to 06:00 (24 hours)

By domain, the following information shall be provided, where appropriate including an indication of confidence level as High, Medium and Low and the period of occurrence (including zero crossing point):

- Minimum and maximum road surface temperature
- Minimum and maximum air temperature
- Accumulation of snowfall on road surfaces and height above sea level

Occurrence of ice, heavy rain, high wind greater than 20 mph at 1.0 m, freezing rain, high temperatures, hoar frost and fog

- Alert level

Additional optional elements can be included at the request of the Client. These should include:

- Urban/rural road surface temperatures
- Bridge deck temperatures

2 to 5 Day Forecast

A 2 to 5-day forecast must be obtained with the 24-hour forecast. The first element of this forecast must detail anticipated conditions in 24-hour periods for days 2 to 5. The 24-hour periods must be 12:00 to 12:00 during the Winter Operational Period and 08:00 to 08:00 during the Summer Operational Period. The parameters to be forecast will differ between the Summer and Winter Operational Periods and should comply with the table above in 6.4.1. The forecast must include:

- A general synopsis and anticipated trends over the period with particular emphasis on the following hazards: Hoar frost, ice, snow, drifting, freezing rain, rain falling on frozen surfaces, heavy rain, fog and high wind greater than 20 mph at 1.0 m.
- Daily general alert level
- Maximum and minimum road surface temperatures
- Maximum and minimum air temperature
- Occurrence of snow, ice, heavy rain, high wind greater than 20 mph at 1.0 m, freezing rain, high temperatures, hoar frost and fog
- Wind speed and timing at 1.0 m
- Confidence level in the forecasts (low, medium or high)

6 to 10 Day Forecast

A second, text element of this forecast must also include a general synopsis and anticipated trends over the 6 to 10-day period with particular emphasis on the following hazards: Hoar frost, ice, snow, drifting, freezing rain, rain falling on frozen surfaces, heavy rain, fog and high wind greater than 20 mph at 1.0m.

Site Specific Forecasts

Detailed 24-hour site specific forecasts must be delivered by 12:00 for all primary environmental sensor stations. These forecasts apply for the Operational Winter Period and must include on an hourly basis:

- Road surface temperature
- Air temperature
- Dew temperature
- Surface state
- Wind speed and timing at 1.0 m
- Humidity %

Additional optional elements should be included at the request of Service Providers. These include:

- Rain state
- Cloud state
- Cloud amount
- Textual site-specific forecasts

Further Updates of Forecasts

Forecast updates apply to 36-hour forecasts and 24-hour site specific forecasts. Whenever a change to any forecast occurs the text forecast will also be re-issued with explanatory notes in the headline along with any other associated changes to the forecast.

A timestamp on the update is required which confirms the date and time the forecast was produced.

The facility to obtain access to previous forecasts is required, allowing the Client to access archived forecast information.

In the event of the update criteria being met, the procedure shall be to notify the client immediately whenever the change will have an impact on proposed salting operations then re-issue the amended forecasts as appropriate. Notice shall be provided by telephone to the client no more than 1 hour following the criteria being met and the updated forecast shall be issued within a further hour. Updates should only be issued between 18:00 and 06:00 or during the overall hazard period; however, the following shall apply in all cases:

The Service Provider shall take note of proposed Client's actions and in the event of a weather forecast changing or actual weather occurring that could result in a change of action by the Client, the Service Provider shall take appropriate action to inform the Client in advance of the changed weather forecast.

The suggested standard update criteria are "A change in the forecast or an actual event occurring that could result in a change in the action taken by the client." This includes changes such as:

- When hazardous conditions are sufficiently more intense or the timing has changed by two or more hours which, in the Service Provider's opinion, may impact on salting operations.
- When road state changes or snow, ice, heavy rain, high wind (define as 20mph), freezing rain, high temperatures (summer), hoar frost and fog are present when they have not previously been forecast.

- A road surface temperature crossing either the +1°C or 0°C threshold two hours earlier than previously forecast or when not previously forecast to do so.
- A significant difference in any precipitation forecast which, in the Service Provider's opinion, may affect the salting times, e.g. showers lasting later into the evening than originally forecast.
- A significant change in any snow forecast, e.g. a change in timing,
- intensity, accumulations or the level to which it will fall.
- When the actual road surface temperature is between plus 0°C and minus 5°C, if the forecast and actual road surface temperature deviates by 1°C or more for a sustained period of more than 1 hour.

In addition, exceptions to normal practice are as follows:

- In the event of forecast winter hazard, such as frost, ice or snow, during the Operational Summer Period the 24-hour forecast, domain forecast and site-specific forecast will revert to that of the Operational Winter Period.
- In the event of a primary forecast site failing for a period of over a month, the Service Provider shall transfer forecast provision to the secondary environmental sensor stations within the climatic domain.

Morning Forecast

A morning forecast/summary must be issued by 06:00. The text of this report should include:

- A brief summary of weather experienced over the previous 24 hours (each domain) summarise including - timing min air/road temps, wind speed, snow/rain fall (data from all weather stations).
- Notification of any suspected faults in the bureau Weather Information Service.

24-Hour Consultancy Service

The Client shall ensure that the Service Provider is available by telephone 24 hours a day, 7 days a week, 365 days a year (including leap years) for consultation on the weather conditions and details of forecasts. The Client should ensure that the Service Provider provides a response within five minutes of any Client enquiry.

Season Analysis (provided electronically and via website secure area)

At the end of each calendar month and at the end of each Operational Winter Period, the Service Provider produces an Operational Assessment Report, within 15 days of specified dates. This report will include details on the accuracy of forecasts based on information provided in the initial and final forecasts. For each forecast site, this analysis must include:

- A graphical representation of actual versus forecast minimum road surface temperatures
- A graphical representation detailing the frost prediction accuracy by comparing forecast frost against actual frost conditions (i.e. frost/frost, frost/no frost, no frost/frost or no frost/no frost)
- The bias and root mean square error in the forecast of minimum road surface temperature.
- Number of evening updates amended within period (using criteria covered in further updates of forecast)
- Outline of lessons learned and particular successes from the previous season.

The Service Provider will retain copies of the analysis and make them available to the Client if required. The Service Provider may also be asked and expected to attend any meeting called by Client to discuss “in season” forecasting issues.

A glossary of terms used in Meteorological Forecast can be found in Appendix D.

6.5 Resources

Beyond normal precautionary salting operations, the HCC Duty Officer may take the decision, in consultation with the Winter Services Manager, to call upon additional resource to that outlined in Organisational Arrangements Section 5.0. This resource would be used to assist with secondary salting and clearance of snow and ice. The level of this resource will be dependent on the severity and extent of the conditions as determined by the Duty Officer.

These additional resources will be sourced from an approved list of other Local Contractors, District/Borough Council, and Farmers. These resources will be deployed once a decision to do so is reached (see decision making section 8.0) and through the appropriate communication channels (see section 7.0).

7.0 Communication

- Good communication between all parties involved in the Winter Operational Service activities is essential. Due to the wide range of personnel and activities involved, the modes and volumes of communication will need to follow defined channels to be the most effective it can be. In this section, significant channels and processes of communication are mapped out.

7.1 Publicity and information

- Before, after and during the winter season, informational communications are deployed about the existence of the winter season, the number of gritters, the number
- of runs and the volume of grit deployed. Social media posts are also used after every decision to undertake a gritting run, along with general road safety messages and updates when appropriate.
- Residents are also able to access information about Winter service policies and priorities via a dedicated Winter Roads webpage, including

web maps showing salting routes and salt bins, and an accessible version of the Winter Service Operational Plan.

- Any media enquiries will go through the corporate communications team.

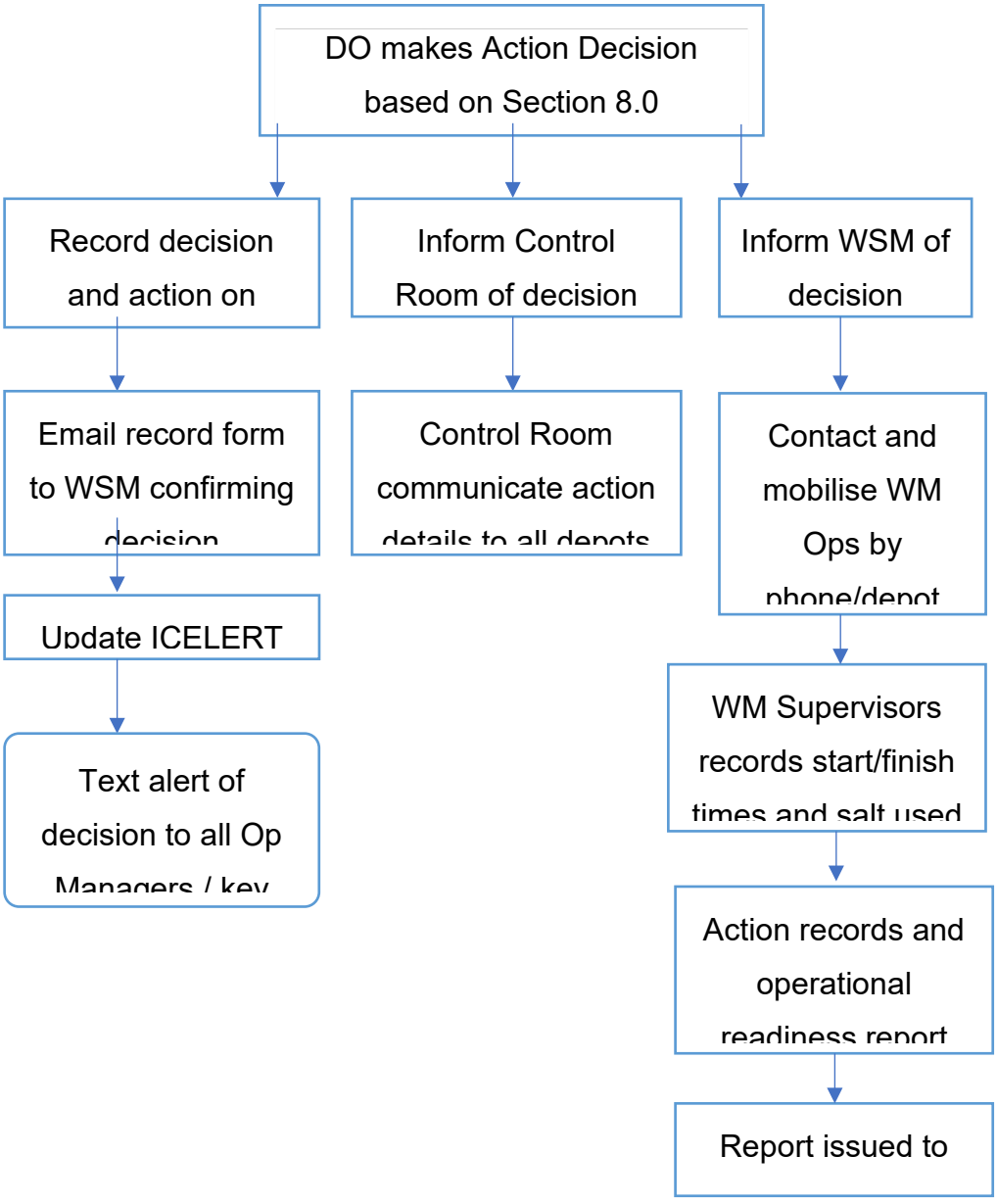
7.2 Prior to Winter Season

- Prior to the season, the Winter Service Manager, Highways Comms Manager and Corporate Comms will work together to agree wording for pre-season generic content as well as promoting winter self-help countdowns.

- Furthermore, the HCC Client manager and the Winter Services Manager will meet and review this plan prior to the winter season to ensure it is fit for purpose.

- Farmers and sub-contractors Districts, Boroughs and community volunteers as well as all Utilities will be contacted via letter reminding them of the upcoming season and the requirements of their services should they be engaged.

7.3 Precautionary Salting Communication Process



Decision made based on Section 8.0, consulting forecasts as per Section 6.4

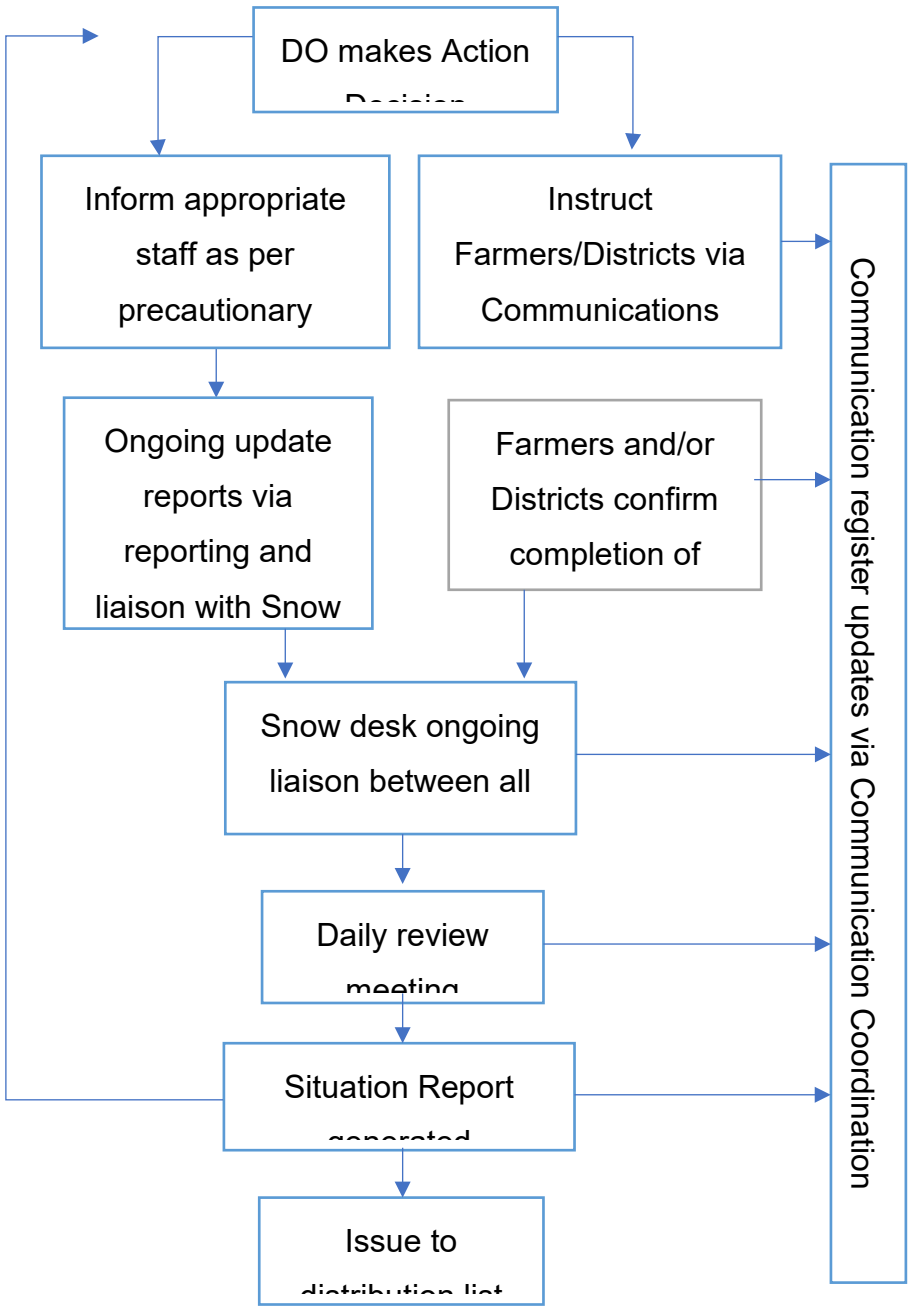
Decision to be made and communicated by 1pm daily

If the WSM is unavailable, then the DO should contact the Emergency Duty Manager

7.4 Severe or Ongoing Winter Action Communication process

- A Communication Coordinator will be appointed to manage a communication log; this log keeps a record of all key communications during the severe or ongoing period until such time that the Duty Officer feels the need has subsided. The log will be kept up to date on an hourly basis. The Communication Coordinator also has further key roles in the communication process as outlined in the flowchart below.

- If during these periods a call is received from a member of the public, the caller should be informed that all available resources have been deployed in the deliverance of the Winter Service Operational Plan, and all roads will be treated by their priority rating.



Decision made based on Section 8.0, consulting forecasts as per section 6.4.

Utilising information and feedback from involvement in Snow Desk Operations and the Daily review meetings

Snow Desk is the designated one point of contact for all enquiries as identified to all 3rd parties

Snow Desk facilitate 1hr/2hr updates between DO & WSM

Daily Review meetings to be minuted by the Communications Coordinator and stored and issued appropriately

8.0 Decision Making

The HCC Duty Officer is responsible for making any treatment decisions.

A secondary Officer will be available throughout the Winter period to aid with verifying any decisions and act as back up.

Decision makers will be suitably trained and equipped to make the winter service decision across the full range of conditions that may be experienced in a winter season.

They should:

- have a thorough understanding of the local network and any temporary or permanent conditions that may require particular consideration in delivering
- have an understanding of the technical process to determine how changes in de-icer, de-icer condition, spreading capability and late changes to weather, road or traffic conditions may impact the level of service delivered
- undertake appropriate training and certification where this is available. This will include refresher training at a minimum of every 3 years.

Decision makers will keep accurate records of the decision-making process and will verify actions with the secondary officer.

They will then instruct the Winter Service Manager of the action and treatment method. For full details of the dissemination of the decision see Section 7.0: Communication. Guidelines for the decision-making process that should be consulted are in NWSRG Winter Service Practical guide. An aide memoir to this process is included below.

Every day throughout the winter period the Duty Officer will produce a record of winter activity and these actions will be recorded on the weather website as below in Table 8 and on the form attached as Appendix G.

Table 7

Message Titles / Action Types	**No Action**	**Standby**	**Action Proposed**	**Snow**	**Information Messages**
Message type:	No Action	Standby at Home Standby in Depots	Action Proposed District/Borough Councils and Farmers be prepared District/Borough Councils and Farmers mobilise	Action Proposed District/Borough Councils and Farmers be prepared District/Borough Councils and Farmers mobilise	Test Message only Information Message
Action Type:	Leave Blank	Leave Blank	15g 8g (15g A41 North of M25 & A505 West of Hitchin) Salt/Sand Mix 15g Ploughing 2x 15g Multiple Actions Hand snow clearance and selective salting Grit bin refilling	15g 8g (15g A41 North of M25 & A505 West of Hitchin) Salt/Sand Mix 15g Ploughing 2x 15g Multiple Actions Hand snow clearance and selective salting Grit bin refilling	Leave Blank
Route:	Leave Blank	Leave Blank	Primary Routes Secondary Routes	Primary Routes Secondary Routes	Leave Blank

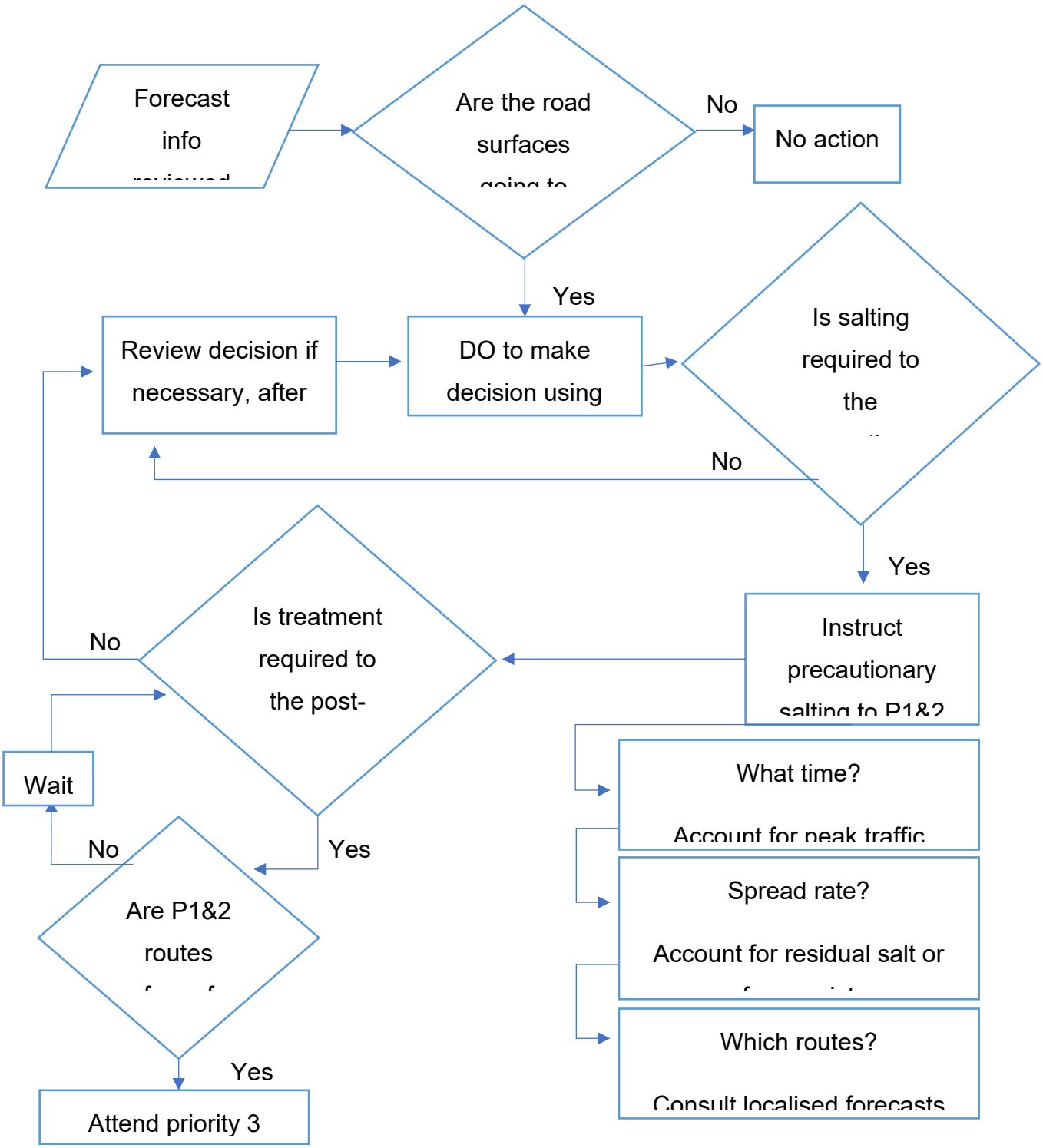
Message Titles / Action Types	No Action	Standby	Action Proposed	Snow	Information Messages
			A41 only High Priority Footways Reduced Network	A41 only High Priority Footways Reduced Network	

Table 8 Decision Maker's Template

Duty Manager:	Auto populated from rota. Can be overwritten if necessary.
Action Time:	If no action leave blank, in all other cases select date and time from calendar.
Priority:	Tick only if action is within next 4 hours.
Header:	Auto populated. **DO NOT CHANGE**
Email Content:	Free text box. Include hazard, road surface temperature, expected weather or any other relevant information.
Footer:	Auto populated. **DO NOT CHANGE**
SMS Content:	Auto populated from email text, but edit message as necessary ensuring full or suitable message.
Message Groups:	Tick Select/Unselect all to ensure message goes out via email and SMS. If you want send to one group only tick relevant group below the main selection box e.g. Blue Light Services. Please note however all messages appear on HCC website regardless if only one group is ticked.

The flowchart below shows the process followed in decision making.

Peak traffic periods are assumed to be 07:30 to 09:00 and 16:30 to 18:30.



8.1 Aid to decision making flow chart and table

Table 9 Precautionary Treatment Decision Matrix

<table>
<tr><th rowspan="2">Road Surface Temperature</th><th rowspan="2">Precipitation</th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Wet</th><th>Wet Patches</th><th>Dry</th></tr>
<tr><td>May fall between 3.0°C – 0.6°C</td><td colspan="4">Standby at Home</td></tr>
<tr><td>May fall below 0.5°C</td><td>No rain
No hoar frost
No fog</td><td rowspan="3">Salt before frost</td><td>Salt before frost</td><td>No action likely monitor weather</td></tr>
<tr><td rowspan="4">Expected to fall below 0.5°C</td><td>No rain
No hoar frost
No fog</td><td rowspan="2">Salt before frost (see road surface wetness below)</td><td></td></tr>
<tr><td>Expected hoar frost
Expected fog</td><td></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, as required during rain and after rain stops</td></tr>
<tr><td>Possible rain
Possible hoar frost
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</td></tr>
</table>

Road Surface Temperature	Precipitation	Predicted Road Conditions		
		Wet	Wet Patches	Dry
The decision to undertake precautionary treatments should be, if appropriate, adjusted to take account of residual salt. All decisions should be evidence based, recorded and require continuous monitoring and review. Decision on treatment timing should account for traffic and road surface wetness at time of treatment and after, as well as forecast conditions.				

Table 10 Precautionary Road Surface Wetness

Definition	Description	Water film thickness (mm)
Dry road	A road that shows no signs of water or dampness at the surface but may be just detectably darker (however it may have moisture contained in pores below the surface that is not 'pumped' to the surface by traffic)	0 to 0.03mm
Damp road	A road which is clearly dark but traffic does not generate any spray. This would be typical of a well-drained road when there has been no rainfall after 6 hours before the treatment time	0.03 to 0.05mm
Wet road	A road on which traffic produces spray but not small water droplets. This would be typical of a well-drained road when there has been rainfall up to 3 hours before the treatment time.	0.05 to 0.1mm

Treatment Matrix

Table 11 Treatment Matrix C – Treated Salting (De-icer spread rates in g/m^2)

Frost or forecast frost **Road Surface Temperature (RST)** **and Road Surface Wetness**	**Good Coverage** **High Traffic** **Normal loss**	**HCC Current Spread rates(* Note)**
RST at or above -2°C and dry or damp road conditions	7	8
RST at or above -2°C and wet road conditions	7	8
RST below -2°C and above -5°C and dry or damp road conditions	7	8
RST below -2°C and above -5°C and wet road conditions	11	15
RST at or below -5°C and above -10°C and dry or damp road conditions	13	15
RST at or below -5°C and above -10°C and wet road conditions°	22	Multiples of 15

***Note: Consider increasing spread rate by 25% (or latest NWSRG guidance) if notified that traffic flow has decreased to less than 6 cars per lane per hour. This will only happen in extreme circumstances e.g. national pandemic.**

Figure 1 Snowfall

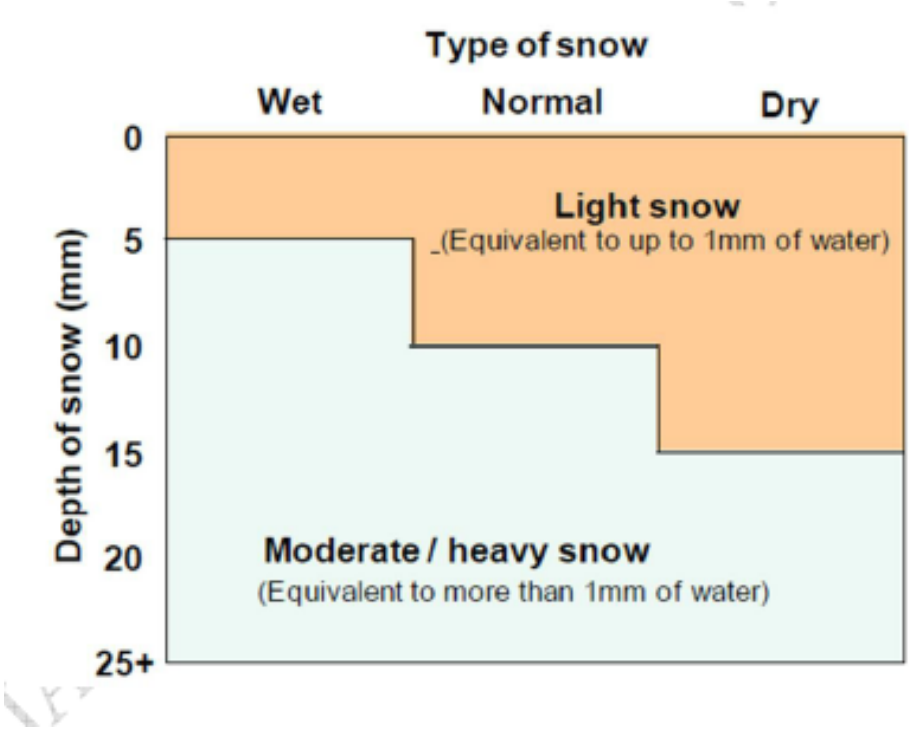


Table 12 Timing of treatments for snow and freezing rain

Timing of treatment	Treatment type
Before snowfall and freezing rain	Salt spreading
During freezing rain, or where there are minor accumulations of ice	Salt spreading
During snowfall	Ploughing Salt spreading
After snowfall When there is slush on the road	Ploughing Salt spreading
After snowfall hen there is compacted snow or ice on the road	Ploughing Salt spreading Salt and abrasive mixtures Abrasives only

8.1.1 Railway Level Crossings

Salt should not be spread across railway crossings. The Railway authority must be consulted before any action is taken to treat accumulations of ice or snow.

8.1.2 Boundary Arrangements with Neighbouring Authorities

There are a number of local arrangements with neighbouring authorities where a road length will be salted crossing over the boundary. However, no routes will stop short of the Hertfordshire boundary.

Current agreed arrangements are as follows (Road Length, treated by*):*

- A111 Stagg Hill from Cockfosters Road to M25 J24 (London Borough of Barnet)
- A1005 The Ridgeway to M25 J24 (London Borough of Enfield)

- A505 Royston from Hyde Hill Farm to A10 roundabout (Cambridgeshire)
- A1010 Abbey Road Waltham Cross Junction of Mollison Ave to Rd-About @ Abbey Road (London Borough of Enfield)
- B655 between Barton and Pegsdon
- Hitchin Road, Arlesey from County boundary to jct. with Arlesey New Road
- Arlesey New Road from junction with Stotfold Road to County Boundary (Bedfordshire treats for Hertfordshire)
- B655 from C146 Pegsdon to County Boundary Norton Road, Stotfold B4540
- (Pt) from County Boundary to junction of Woodside Road, Slip End
- B653 from Country Boundary to East Hyde crossroads (Hertfordshire treats for Bedfordshire)

8.1.3 Mutual Aid

During severe weather Highways will seek to fulfil its obligations to ensure movement of traffic on its own roads and on those of adjoining authorities by providing assistance to its neighbours and expects the same in return. Agreements on mutual aid exist with National Highways where their Motorways and trunk Roads run through the county, and also with the neighbouring authorities within the East of England Consortium group. Aid may also be requested from other parts of the Ringway group.

8.1.4 Road closures, diversions and Road Traffic Collisions (RTC), Road sections that are inaccessible

For planned road closures, consideration should be given to the effect on the salted road network.

Usually, it will be the diversion route that is salted, unless the scheme promoter has instructed that the closed section of road is to also receive salting. Even where a non-precautionary road is to be closed, the scheme promoter should assess if the increased traffic on the diversion route warrants a change to salting practices.

Where a road closure without special instructions or an unplanned closure such as an RTC is encountered by a salting vehicle, the default will be to salt the alternative route or signed diversion route.

Further instruction may need to be sought for part time closures where the untreated closed road section may be reopened to traffic while temperatures are still below or may fall below zero.

When undertakers are planning works during the winter period they should consult with HCC as to how risks of the formation of ice/snow on the highway can be mitigated.

Where road sections are inaccessible due to parked cars or unrecorded changes in the road construction, the driver must make every reasonable safe effort to treat these sections and will report these instances immediately upon returning to the depot to enable a record to be made, and for suitable alternate salting to be delivered i.e. smaller vehicle, hand salting, etc., and for consideration of removal of that road section from the treated network, a daily report will be submitted to the duty officer by 0800 the following day.

8.1.5 Police and other authority requests during routine treatments and snow events

Specific requests from the police will be coordinated through the HCC Duty Officer but the total resource will be controlled by the Winter Services Manager. Under no circumstance is a driver to be diverted from their route unless specifically directed by the Winter Services Manager.

8.1.6 Snow Clearance

The decision to move to the snow clearance operation shall be made by the HCC Duty Officer following consultation with the Winter Service Manager, who will then control this operation.

Snowfall of less than 30mm will not normally require any further action than precautionary salting unless prolonged sub-zero temperatures are forecast.

For snowfalls in excess of 30mm or when drifting occurs, post salting and ploughing will take place as soon as is practicable. In accordance with a risk-based approach, the majority of ploughing vehicles should be concentrated on priority 1 and 2(a) roads

with sufficient resource to establish as rapidly as possible one clear lane in each direction. This allows a programmed approach to dealing with ice on non-precautionary salting routes.

In the most severe cases it may be necessary to deploy all available resource to maintain free flow on the major routes and minimise unsafe conditions. These routes will provide an arterial network enabling plant and equipment to reach lesser priority roads.

When the HCC Duty Officer is satisfied that the priority 1 and 2(a) roads are operational and clear of hazards, they should deploy the ploughing vehicles to priority 2(b), then priority 3 and then other parts of the network as resources are available.

The operational resource will not move from one priority treatment to another until all the higher priority roads are to the operational standard and should reports of ice or snow be received on a priority already treated, then that priority should be monitored and revisited.

The priority for treatment of the road and footway network is set out in the table in Section 4 of this plan.

Communication of all decisions will be recorded by the Duty Officer and the action log during snow events. Daily /weekly bulletins will be issued, along with Twitter updates.

Additional resources including local farmers who have registered with Ringway may self-mobilise or shall be mobilised by the HCC Duty Officer / “snow desk”.

8.1.7 Additional Treatments

During severe weather conditions the Duty Officer may request in consultation with the Winter Service Manager additional salting and actions on roads of specific importance such as the A41, A505, A507. These actions may include escorted runs under police rolling road blocks. The use of salt /sand /grit mix may also be considered.

8.1.8 Clearance of Snow and Ice on High Priority Footways

As with carriageways, the footways will be dealt with in strict priority order, and will be treated with the same priority system. Dependant on weather conditions the Duty Officer may approve some pre-treatment of the high priority footways, as per the priorities set out in section 4.

8.1.9 Reports of Ice on the Public Highway

Information from the police or emergency services will be actioned in line with the priorities as described in this plan.

Clarifications should be sought as to whether ice/snow is affecting one specific site or a general area, and to the cause of the slipperiness. For example, it could be either a diesel spill or a result of salt in solution.

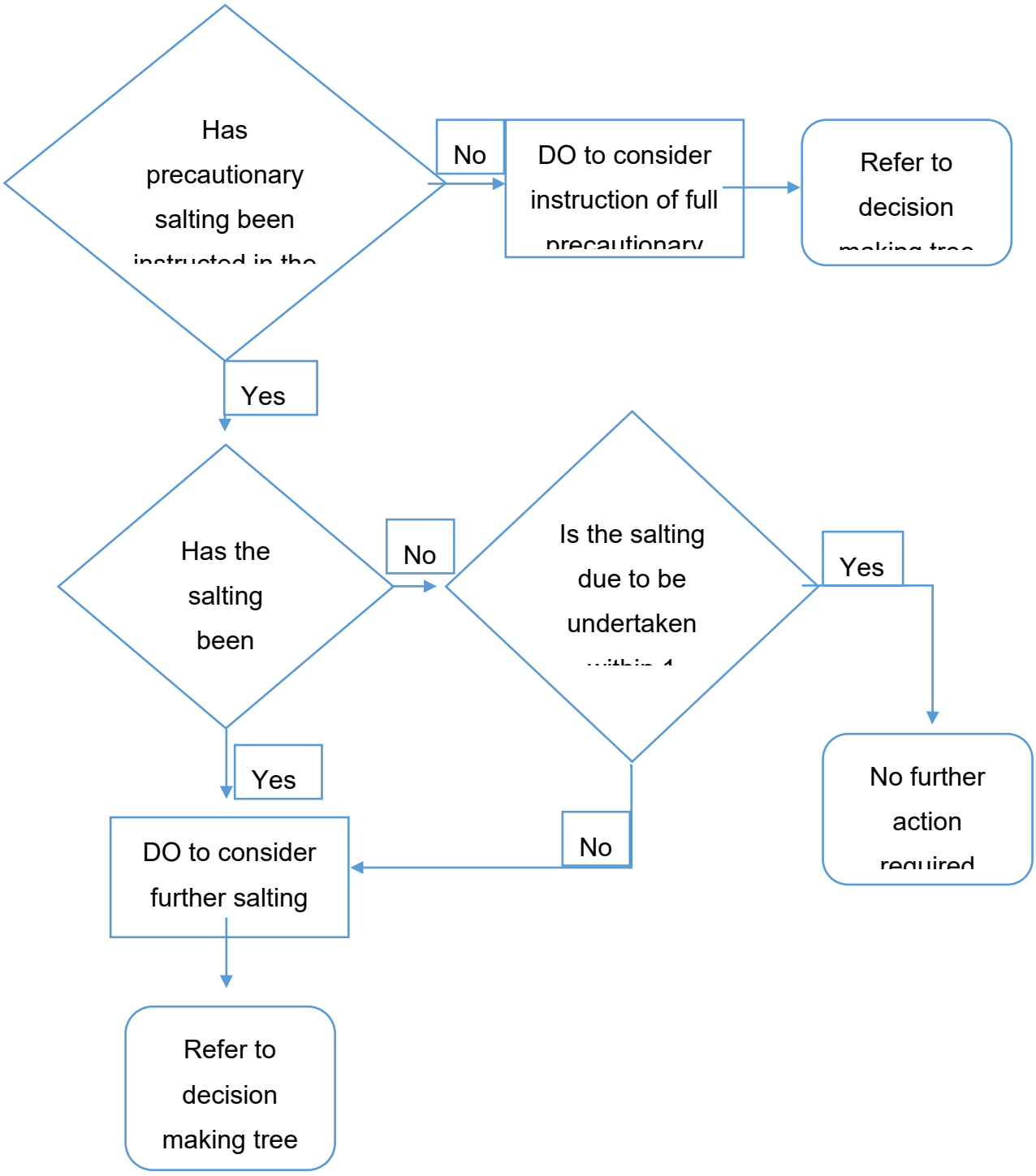
No action will be taken to treat ice on private roads (i.e. where there is no public right of highway rights) unless specific arrangements are in place.

If seepage and run-off from adjacent properties leads to reported ice, where these are on sections of the priority (1, 2, 2a, 2b) treated network, response teams will be dispatched to mitigate these risks. The local engineering team will also be notified for suitable remedial actions to be considered and undertaken.

8.1.10 Report of ice on a precautionary salting route

Reports of ice on precautionary salting routes will be actioned as per flow chart on next page:

Aid to Decision Making Flow chart



8.1.11 Report of ice on a non-precautionary salting route

Only the following reports will normally be actioned (unless post salting is instructed, see below). The target time to respond to these is 2 hours.

1. Request from Police following an incident or accident where ice is a contributory factor.
2. Where an incident has caused a significant increase in traffic onto a non-precautionary salting route.
3. Any other incident causing a significant increase in traffic, e.g. a motorway closure, or major event.
4. After fire-fighting activities where there is (potential for) significant amounts of ice.
5. For any utility leakage onto the highway the water authority responsible must be given the opportunity to remove the ice and each will have their own response plans for this scenario. If the owner of leak is unknown, action should be taken to treat the ice or potential for ice. In extreme circumstances it may be necessary to sign areas or cone off or close sections of Highway if the police feel the potential hazard is great.

During severe weather events consideration of re-treatment of lower priority roads will be made by the HCC decision maker.

8.1.12 Prolonged freezing temperatures

When prolonged sub-zero temperatures are forecast, (temperatures below 0ºC for a period of longer than 48 hours), post salting (Priority 3) will be considered. This allows a risk-based approach to dealing with ice not on precautionary salting routes.

8.1.13 Schools

Treatments to all schools to be included in the precautionary salting network where practical and accessible. All Schools can also apply for salt for use on the highway as part of the winter self-help scheme.

8.1.14 Bus Routes

During each summer review HCC-scheduled bus routes will be checked against the priority coverage. Bus routes that enter cul-de-sacs or private non- maintainable areas where spreading vehicles cannot turn without reversing will not be treated. For these areas, schools should be referred to the section above for winter self-help.

9.0 Treatment Methods

9.1 Precautionary Salting

The target is to pre-salt the precautionary network before ice forms or snow settles on the road. Essentially it is planned as a result of weather forecasts to pre-set spread rates following the Decision and Treatment matrices.

When continuous snow is forecast every effort will be made to ensure enough salt is applied to melt the initial snowfall and to provide a wet surface.

9.2 Snow Clearance

Snow ploughing shall be undertaken as soon as snow depths exceed 30mm, and will be combined with successive salt spreading.

Light snowfalls may call for ploughing where local drifting has occurred, or to remove snow not dispersed by traffic. E.g. where traffic is reluctant to use outer lanes of dual carriageways, or at night when traffic is light.

If snow depths reach 120mm, or when tackling drifts or when working on gradients, ploughing may be undertaken without salting as the weight of the load may aid vehicle traction. As soon as the situation is under control spreading will be resumed.

Where heavy or prolonged snowfalls accumulate on high-risk footways, arrangements will be made to clear a route for pedestrians as soon as practical if resources allow. If freezing conditions persist, footways cleared of snow should be given a light salting to melt the ice, consideration may be made as to high priority footways being pre-treated. This may be carried out by District and Borough staff.

Clearance of snow from less heavily used footways will depend upon the anticipated duration of freezing conditions. Provided the more heavily used footways have been cleared and freezing conditions are expected to persist, then these footways may be cleared.

Local farmers may self-mobilise to clear snow in rural areas.

10.0 Documentation/Recording of Information

All duty officer reports and actions will be forwarded to The HCC Client manager for electronic storage.

Documents will be stored according to dates and timings of actions.

Table 13

Reference	**Description**	**Responsibility for Records** a) Retention of. b) Disposal of.	**Location Held/ Storage Medium** Electronic (E)	**Retention Period** Years (Y) Months (M)
H23-01	Winter Maintenance Operational Report	*a&b Duty Officer*	*E*	
H23-03	Winter Maintenance Record Form	*a&b Duty Officer*	*E*	*6 years*

11.0 Key Performance Indicators (KPIs)

Table 14

Response to Salting Decision	Complete Pre-Treatment or Post-Treatment salting within the required response period notified to the HST Contractor's Duty Manager by the Council's decision maker in accordance with the Service Information.	Any failure to complete salting of any individual Salting Route within the required response period (subject to extenuating operational circumstances being given by the Contractor and reasonably accepted by the Employer)	£200 per decision per route.
Winter Service Salt Stock Levels	Maintain the Winter Service - Minimum Salt Stock Level (as defined in the Service Information) at all times throughout the Winter Service Period.	Any occasion when the total salt stock level held by the Contractor within the Winter Service Depots on the Network falls below the Minimum Salt Stock Level (subject to extenuating operational circumstances being given by the Contractor and reasonably accepted by the Employer)	£200 per day or part of a day.

11.1 Resources & Budget

Budget for Year is £5 Million

11.2 Structure and Resources

Table 15 Winter Operations Team

	Steve Johnson – Head of Highway Contracts and Network Management
Group Manager	
HCC Lead Officer / Winter Manager	
HCC **Decision makers**	
Ringway Lead Officer / Winter Manager	

11.3 Responsibilities / Team Delegations and Accountabilities

Table 16

Name	Team Delegations and Accountabilities
Cllr Phil Bibby	Executive Member
Tony Boucher	Director Highways Operations
Steve Johnson	Agree / Sign Plan
	Develop Strategy implementation of plan / Sign plan / Responsible HCC Officer
	Accountable HCC Manager
	Ringway Operational lead
	Ringway Winter service manager

11.4 Service Priorities

Adherence to the key performance indicators and application of Failure to Deliver events.

(FDEs) assumes normal operating conditions. Deployment during periods of heavy snow or peak hours of traffic will be seen as potential mitigating circumstances and raised as such with the HCC Client Manager.

Where unforeseen circumstances make accessibility impossible, all reasonable efforts will be made to complete the whole route and/or a suitable diversion route as a priority notwithstanding KPI targets.

Failure of HCC to provide a standby instruction by 15:00, or failure to comply with any other communications protocols as outlined in Schedule 5 to The Contract will be viewed as mitigating circumstances and therefore KPIs suspended.

Any issues that are not resolved between the HCC Client Manager and the Ringway Performance and Quality Manager will be escalated to the Contracts and Performance Working Group for final decision. All mitigating circumstances or unforeseen events will be detailed in the Operational Situation Report.

Service Levels / Performance Targets (KPIs)

The Performance Indicators in the Contract Performance Framework that directly apply to the Winter Maintenance Service are detailed in Schedule 7 to The Contract (reference 28 and 29) and monitor percentage of salting routes completed in time within a month, and percentage of salt bins filled to an agreed programme.

These PIs are subject to annual review as part of the performance planning regime as outlined in the Performance Plan.

There are other more general indicators affected by the Winter Maintenance Service and these are fully detailed in the Performance Plan:

- Ensuring correct spread rates by calibrating the gritting vehicles.
- Controlling the Salt usage by measuring the amount of salt used by weighing the gritting vehicle before and after each call out.
- Measuring the fuel consumption on each route at different times of the day as this may impact the overall cost.
- Recording the overall completion speed of a route through our eServe Vehicle Tracking system.
- Ensuring the route has been completed on time via our eServe Vehicle Tracking system and the time recorded on the weighbridge ticket.

11.5 Risks and Challenges

Table 17

No.	Risk	Probability	Impact	Mitigation	Adequate	Further measures
1	Salt stocks (usage)	Medium	High	Close stock management and resilience planning	Yes	
2	Salt stocks (delivery)	Medium	High	Ringway's source delivery mechanism	No	Early indication of issues and resolution
3	Vehicles	Medium	Medium	Spare vehicles loss, attention to servicing and vehicle checks	Yes	
4	Sickness	Medium	Medium	Availability of spare drivers	Yes	
5	Depot closure	Low	Medium	Ability to work from three depots	No	If more than two depots consider salt stocks and resilience, Mutual Aid.
6	Continuous severe weather	Medium	High	Snow desk operation and reduction in network treatment coverage national guidance.	Yes	

No.	Risk	Probability	Impact	Mitigation	Adequate	Further measures
7	Bureau failure	Medium	Medium	Relationship with provider and back up of servers, maintenance regime, Client officers qualified to assist.	Yes	
8	Loss of forecasts	Medium	Medium	Have fall-back position for verbal instruction	Yes	
9	Weather station failure	Medium	Low	Use forecaster instruction	Yes	
10	Loss of duty officers	Medium	Low	Use of secondary officer roster	Yes	
11	Loss of IT	High	Medium	Use verbal communications	Yes	
12	Early withdrawal from current contract	Low (at this time)	Very High	Urgent and immediate re-procurement at higher value.	No	Additional budget, Mutual Aid

11.6 Development Initiatives / Asset Management

The winter operational plan will be reviewed annually and adapted to meet with the ever-developing winter operations market. Plans to investigate alternate methods of spreading including pre- wet or liquids should not be ruled out.

HCC has historically been a leader in developing its winter operations and will continue to invest in time and resource along with Ringway its contractor to provide the most efficient and effective plan as resources allow.

Table 18

No	Development Needs	By When	Revised Date	Approximate Cost
1	Duty officer training and accreditation	2016	2019	£4k
2	Route optimisation	2016/17	2018	Borne by Ringway
3	Alternate treatment methods	2016/17	2018/19	Borne by Ringway

11.7 Review and Development Summary

This plan will be reviewed annually and presented to the Highways and Environment Cabinet Panel and Cabinet in line with the calendar of these meetings.

It can also be updated during the season by the HCC Winter Service Manager or their deputy, in consultation with the Executive Member for Highways and Environment or their deputy, who can vary the WSOP where needed in relation to a national pandemic or emergency, without taking additional reports to Highways and Environment Cabinet Panel and Cabinet, as agreed by the Highways Environment Cabinet Panel and Cabinet in November 2020.

A full review of the treated network will be undertaken as per a 10-year rolling plan, with an annual review of minor route changes.

Developments in operational techniques will be evaluated and incorporated as appropriate to Hertfordshire’s needs.

Appendix A

Depots

Hoe Lane, Ware (2)

Hoe Lane

Ware

Hertfordshire

SG13 9EY

Railway Terrace, Kings Langley (1)

Langley Wharf

Railway Terrace

Kings Langley

Hertfordshire

WD4 8FE

South Mimms, Potters Bar (4)

Charleston Paddock

Old St Albans Road

South Mimms

Potters Bar

EN6 3ND

Corey's Mill, Stevenage (3)

Corey's Mill

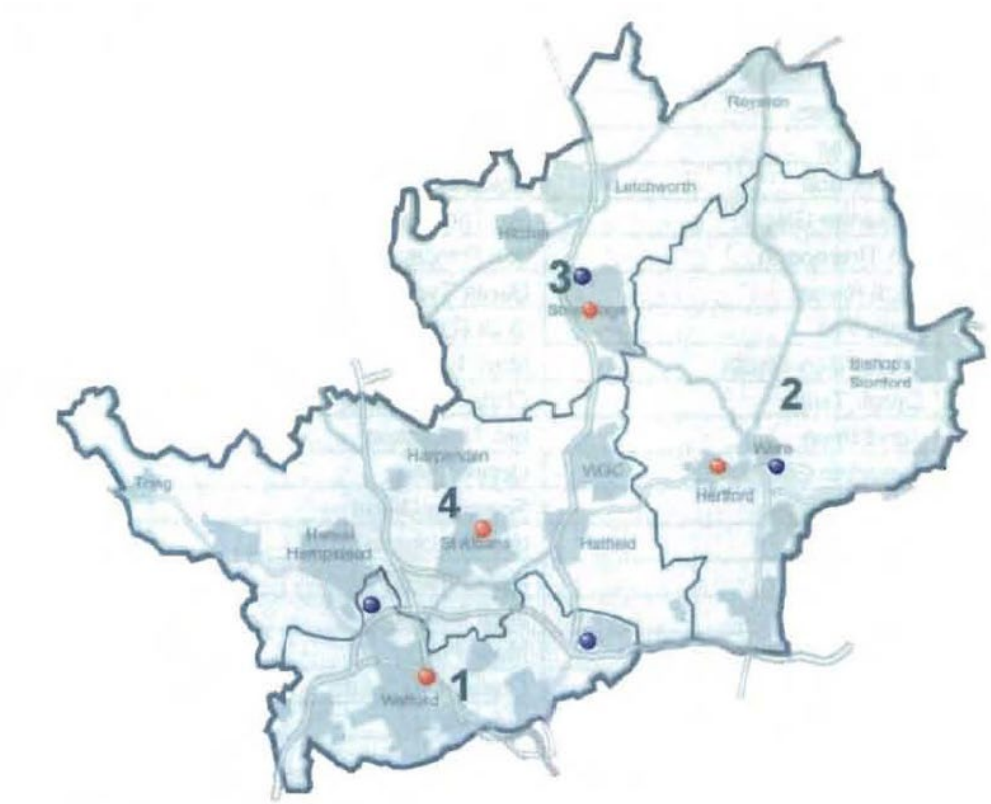
Hitchin Road

Stevenage

Hertfordshire

SG1 4FD

Figure 2



Blue dots denotes depot location

A smaller depot is located at Welwyn Garden City, Broadwater Road, Welwyn Garden City Herts, AL7 3AX (currently no gritters leave from this location).

Appendix B

Trained Winter Service Operations Personnel and HCC Duty Officers (Decision Makers)

Rota of trained duty officers (see section 11.2) to be finalised and published in October 2022.

Ringway Operation Resources

Rotas' will be finalised and published in October 2023

Additional resource (direct and/or subcontractors) will be used to manage and deliver Winter Service operations to a level and duration appropriate to winter events and conditions.

Appendix C

Location of Salt Bins

Location maps of salt bins can be found at:

www.hertfordshire.gov.uk/winterroads

Appendix D

Glossary of Meteorological Terms

Accretion - The build-up of snow on objects such as overhead cables, road signs and tree branches. It occurs when wet snow, with temperatures close to freezing, is accompanied by a strong wind. The wet snow freezes on to objects under pressure of the wind. The build-up of snow can be quite large, and can cause damage to cables and trees.

Air frost - This occurs when air temperatures (measured between 1 and 2 metres above the ground) fall below zero degrees Celsius.

Black ice - Clear ice which forms on roads due to the freezing of standing water. Occasionally it may be formed by the transformation of hoar frost, under pressure from car tyres. The name black ice is used, as the road blacktop can be seen through the clear ice. The term is much beloved by the media, but is used less frequently in road weather forecasts.

Bureau - This refers to an in station that is shared with other authorities (see In station, Master station and CPU).

Climatic domain - An area of a county with broadly similar climatic characteristics e.g. an urban area, or a high-level area, or coastal area. See Forecast Site.

Condensation - This is the change of state of water vapour to liquid water, thus forming a thin film or mist of water on surfaces such as roads. During the process, heat is released (see Latent Heat, Dew point).

Confidence factor - Used by weather forecast organisations to give guidance to highway engineers on the likelihood of forecasts having to be subsequently amended. Confidence HIGH means that amends are unlikely and confidence LOW that amendments are likely. Some use is made of MEDIUM confidence, although usage is discouraged, as it can be confusing.

Damped - This is the thermal map type that occurs on cloudy, windy nights. Temperature differences along a stretch of road are at a minimum (see Thermal Mapping).

Deliquescence - The chemical property whereby a substance will absorb water from the air before the air is saturated. Salt is deliquescent and will absorb water from 80% relative humidity upwards (see Relative Humidity),

Deposition -This term covers the change of state from water vapour to ice without going through the liquid water stage (see Hoar Frost).

Depth temperature -The temperature measured at around 30cm below the road surface (usually below the main asphalt layer). It can give indication of ground heat flux (see ground heat flux).

Dew - Liquid water formed on a surface by condensation from the atmosphere.

Dew point - The temperature to which a sample of air must be cooled for condensation to take place. Dew point can be measured directly by instrumentation e.g. road sensors.

Drifting - The movement of snow (usually powder snow) under the influence of wind. Snow need not be actually falling for drifting to take place.

Dry adiabatic lapse rate - The temperature falls with height within a sample of air before it becomes saturated. The rate of fall is 0.98 degrees Celsius per 100 metres (around 3 degrees Celsius per 1000 feet).

Evaporation - The change of state from water to water vapour. The process takes in heat and causes cooling (see Latent Heat).

Extreme - The thermal map type that occurs on calm, clear nights. Temperature differences along a stretch of road tend to be at their maximum (see Thermal Mapping).

Flash frost - The rapid build-up of hoar frost on roads around sunrise. Roads can change from dry to a significant cover of hoar frost within 15 minutes (see Hoar Frost).

Fog - The suspension of water droplets in air at or close to the ground.

Forecast site - A road sensor site for which a graphical forecast is provided. It is usual to have one forecast site per climatological domain, see climatological domain.

Freezing fog - Fog which forms when air temperatures are below freezing. The fog droplets remain in the liquid state, but will freeze on contact with trees and other objects, and under some circumstances the road surface (see Rime).

Freezing point - The temperature at which pure water will change to ice (although strictly it is the temperature at which ice melts) in practice 0.0 degrees Celsius.

Freezing rain - A very dangerous condition where raindrops (from warmer air aloft) fall on to surfaces below freezing, thus freezing instantly and causing widespread ice. Fortunately, rare in the UK. Most likely to occur at the end of a prolonged spell of cold weather.

Frequent - Used in conjunction with showers. The term frequent shower implies that nearly all areas will catch a shower, and many places will see more than one shower (see isolated and scattered).

Frost - A generic term to cover temperatures below freezing. Where these temperatures occur describes the type of frost (air frost, ground frost, road frost etc.) The rather loose term of 'frost' is rarely used in road weather forecasts without qualifying it.

Ground frost - This term is used to describe occasions when temperatures on the ground (as opposed to in the air) fall below freezing. The official meteorological definition uses the temperature over short mown grass. The term has little relevance to winter maintenance, which is concerned specifically with road temperatures. The term 'ground frost' heard on media forecasts (TV, radio) does not guarantee that there will also be a road frost.

Ground heat flux - This is a term in the heat balance at the road surface. It represents the now of heat up from the ground to the road surface (usually overnight) or the flow of heat from the road surface down to the road (usually during the day). The direction of the ground heat flux can be determined by whether the depth temperature is higher or lower than the road temperature (road temperature lower than the depth temperature implies the heat nux is from ground to road and vice versa).

Hail - Precipitation in the form of frozen raindrops. Usually occurs in showers.

Hoar frost - Deposition of water vapour directly as ice on to ground surfaces. The ice forms as white crystals and is usually highly visible. Hoar frost is more common over grass than on roads.

Ice - A generic term for frozen water. In winter maintenance terms usually refers to clear ice on road surfaces (see Black Ice).

Icy patches - Used in road weather forecasts to indicate ice formation in prone areas only (gutters, dips in the road surface etc.)

Icy stretches - Used in road weather forecasts to indicate more widespread ice.

Isolated - Used in conjunction with showers, isolated showers implies that most places will stay dry, but somewhere within the area of coverage a shower may occur (see frequent and scattered).

In station - Generic term for Master station, CPU or Bureau (see Master station, CPU and Bureau).

Intermediate - The thermal map type that occurs on nights where cloud cover, wind speed (or both) is variable. Road temperature differences tend to lie between the Damped and Extreme values (see Thermal Mapping).

Latent heat flux - This term covers heat released or taken in by a change of state of water. The evaporation of water and the melting of ice take in heat (and so cause cooling), whereas condensation and freezing release heat.

Long wave radiation - This is heat transferred from objects by infrared radiation, at temperatures around the terrestrial norm (say between plus and minus 20 degrees Celsius). This includes the road surface itself and clouds. Radiation from the sun is in the short wave (as the sun is much hotter).

Marginal - This describes nights where the road temperature is expected to be very close to freezing (normally within one degree Celsius).

Master station - The computer system that dials the road sensors (once an hour usually) controls communications with the weather forecast organisation and allows access by secondary master stations or workstations. (See Bureau and in station).

Midwinter solstice - The day of the year when the midday sun is at its lowest elevation in the sky (in practice when incoming solar radiation is at its weakest). The actual day varies between the 20th and 24th December. At this time the difference between the minimum road temperature and minimum air temperature is at its highest (road temperature around 2.2 degrees Celsius less than the air temperature on average, in the absence of other terms).

Outstation - Another name for a road sensor.

Powder snow - The form of snow that occurs when air temperatures are well below freezing (minus 2 degrees Celsius or less). This form of snow is very fine (like sugar crystals), drifts very easily, but does not tend to stick to objects (no accretion). It can be handled by snow blowers. Salt is usually less effective.

Precipitation – A generic term that covers all water (or ice) that falls from the skies. As well as rain, sleet, snow and hail it also includes dew, hoar frost and fog.

Radar - See Weather Radar.

Radiation - A general term which covers transfer of heat from one object to the other by electromagnetic waves (infrared radiation). All objects above absolute zero)-273.15 degrees Celsius) radiate heat, and the hotter an object is, the shorter the wavelength of the radiation.

Rain - Water droplets that fall from clouds. Rain takes many forms, and can be of many different intensities and durations. Within road weather forecasts there will often be differentiation between rain and showers, the former usually referring to longer lived but light intensity precipitation, and the latter to short duration but heavy intensity.

Relative humidity - This is the amount of actual water vapour held in a sample of air at a given temperature, divided by the maximum amount of water that could be held in that sample of air at that temperature, expressed as a percentage. Within fog or heavy rain, humidity's may reach 100%, on a sunny, warm afternoon in summer; humidity's may fall to 30%. On an average night in winter, humidity's rarely fall below 80% (which is the minimum humidity at which salt crystals will start to absorb water).

Rime - Deposition of ice from freezing fog. It is a white form of ice, similar to hoar frost, but has a finer (at times feathery) structure. On roads, tends to be more of a problem at higher levels than lower levels.

Saturated - Air is said to be saturated when, at a given temperature, it holds the maximum amount of water vapour possible. Any cooling below its current temperature will result in condensation. The relative humidity of saturated air is 100%.

Saturated adiabatic lapse rate - The rate at which air temperature falls with height within saturated air e.g. within fog or cloud. It is less than the dry adiabatic lapse rate, 0.49 degrees Celsius per 100 metres or around 1.5 degrees Celsius per 100 feet.

Scattered - Used in conjunction with showers. Scattered showers imply that a wide covering of showers across an area is expected. Most places will see at shower but one or two locations may stay dry (see Frequent and Isolated).

Secondary master station - A PC/Laptop that the highway engineer uses to access the Master Station. May also be referred to as a Workstation.

Seepage - Leakage of ground water from roadside verges. Can cause roads to become wet, when otherwise they would have stayed dry, possibly leading to ice formation later.

Sensible heat flux - The transfer of heat between the air and the road surface. This is largely controlled by the wind.

Sleet - Partially melted snow. If precipitation becomes heavy, sleet may readily turn to snow.

Snow - A form of precipitation where tiny ice crystals bond together into flakes. Snow can be either of the Wet or Powder forms.

Solar radiation – Incoming sunshine during the day. It is short wave radiation.

Solstice - See Midwinter solstice.

Thermal fingerprint - The temperature trace along a road surface (usually recorded by an infra-red thermometer during a thermal mapping run). Regardless of the mean temperature of the trace, it shows the thermal characteristics of the road surface (warm and cold spots).

Thermal map - The representation of relative variations in road surface minimum temperature for each of three weather categories, presented in colour bands (usually of 1 degree Celsius).

Thermal mapping - The technique used to produce the thermal fingerprint of a road.

Thermal map type - Defined as damped, intermediate or extreme (see previous entries). When using thermal maps in the forecast mode, the weather forecast organisations will send the thermal map type with the ice prediction graph.

Wash off - This occurs when rain is sufficiently heavy to remove salt solution from the road surface.

Water vapour - Water in its gaseous state.

Weather radar - A network of radars that uses a beam specifically tuned to detect rain droplets (or snowflakes) and hence infers the location and intensity of rain reaching the surface.

Wet snow - Snow that falls with air temperature close to freezing point. It melts easily and can be very sticky (see Accretion). It is more common in the UK than the other variant of powder snow.

Wintry - This term covers precipitation, which contains ice in one of its many variants (sleet, wet snow and hail). The term is used extensively in media forecasts (e.g. wintry showers are expected; showers will turn wintry over hills). However, the term is ambiguous in road weather terms and hence any precipitation containing ice will be described more fully, with likely effects on the road.

Workstation - Typically a laptop PC that can be used by the Highway Engineer to access the CPU or bureau (see Secondary Master station).

Appendix E

Examples of letters to 3rd parties

Winter Self Help Scheme 2023-2024 - Salt for Districts / Boroughs / Town / Parish Councils, Recognised Resident Groups / Recognised Community Associations / Schools and Covid Test and Vaccination Centres.

Following the success of previous winter joint operations Hertfordshire County Council is pleased to release the details of our planned availability of salt supplies for our partners.

During the last season many of Hertfordshire's Districts/Boroughs/Towns/Parish Councils and recognised resident groups assisted with snow clearance and footway treatments. This was of tremendous help to our salting and snow clearing efforts. All of this hard work has meant that our councils' services to the public have not been disrupted.

Following last season's success, we now plan to restock each of our Districts/Boroughs/Towns/Parish Councils, recognised resident groups and recognised community associations to enable the availability of these support operations.

Please note for Town/Parish Councils and recognised resident groups this is a **ONE-OFF** delivery for highways use only.

District and Borough Councils can receive up to 30 tonnes to assist with highway treatments at no cost with a further 50 tonnes available at cost.

Town/Parish Councils can apply for up to 850 kg in the form of a Hippo-style Grab bag, or up to 34 individual 20 kg Bags.

Recognised resident groups and recognised community associations can apply via their County Councillor for up to 34 x 25kg bags. To apply please go to: -

www.hertfordshire.gov.uk/winterroads

Additionally, a County Councillor can identify suitable recognised groups that can take delivery of this resource.

Further information regarding salt deployment or regarding Hertfordshire County Council's winter operations can be obtained by contacting us at winterselfhelp@hertfordshire.gov.uk marked Winter Self-Help.

Deployment will begin from mid to late October 2023 to allow resource to be in place prior to the high-risk winter period 1 December 2023. Applications after 31 October **will not** be processed.

- We appreciate the continuing efforts in assisting us during severe winter conditions.

Many thanks

Ross Bevan Assistant Network Manager, Hertfordshire County Council Highways

Utility Companies

Again, a new winter season is upon us in which we anticipate a greater interest on the impact of the formation of ice on the highway as a result of previous year's severe weather events and a greater public expectation.

In view of this increased activity and visibility we annually contact key partners and review our policy and procedures for the management of water discharged on to the network from third party apparatus i.e. blocked drains, sewers, leaking and burst pipes, pumping out of chambers, road cleaning /sweeping etc. that is likely to constitute a hazard to the highway user during the winter period.

We appreciate that in the nature of your activity the discharge of water on to the network is inevitable. We also appreciate that you will have your own procedures for dealing with the accumulation of water on the highway or where water is likely to be "dragged" by traffic and there is a risk of the formation of ice. We anticipate that these procedures include the use of warning signs and minimal salting actions, where appropriate and would be grateful if you could confirm in writing the arrangements you have in place including emergency contact numbers.

We wish to continue to support these occasions, with Hertfordshire County Council Highways providing additional support through our Emergency Response crews and the gritting fleet.

Your organisation should contact our Out of Hours Emergency contact telephone number and request additional salting support. A clear location and a contact number and an expected time of arrival of any technician or maintenance crew, on occasions where we are the first to arrive at site, our staff will await the arrival of your staff for instruction.

The Winter Duty Officer (Hertfordshire County Council) will have to take into account that “gritters” are not diverted from the pre- intended routes. These outings shall be recorded and the appropriate recharge will be recovered from you the requesting utility.

Should you require any further clarification or details regarding the County’s Winter Service please feel free to contact me on the above number, alternatively the County’s Winter Service Operational Plan and information regarding salting actions is available through the web site link below.

www.hertfordshire.gov.uk/winterroads

May I also take this opportunity to thank you for your continued support in allowing us to manage the Highway Network for the travelling public in Hertfordshire.

Yours sincerely

Ross Bevan

Assistant Network Manager.

Appendix F

Precautionary Salting Route Plans

Updated Information is available at _www.hertfordshire.gov.uk/winterroads

Appendix G

List of key contacts redacted due to GDPR restrictions around personal details.

Appendix H: Duty Officer Record Sheet

Duty Officer		**Day**		**Date**	

Previous 24hrs (Note any issues below)	**Min Hertfordshire Weather Station RST**	^{0}C

Morning Forecast (24 hours' summary)			Time of forecast	
Min Hertfordshire RST	^{0}C	**Min Air Temp**		^{0}C

Lunchtime Forecast (24-hour summary)			Time of forecast	
Min Hertfordshire RST	**^{0}C**	**Min Air Temp**		**^{0}C**
Below zero temperatures expected between		hrs	**And**	hrs
Hazards expected				

Actions					
Time of decision	**Routes**			**Action**	**Time**
Informed Works Team		**ICELERT**		**Twitter**	
Called DC to action		**Called Farmers to action**			

2- 5 Day Summary

6- 10 Day Summary

Evening Forecast (24-hour summary) ***Only record details if significantly different to lunchtime forecast***			Time of forecast	
Min Hertfordshire RST	^{0}C	**Min Air Temp**		^{0}C
Below zero temperatures expected between		hrs	**And**	hrs
Hazards expected				

Actions Amended following updated forecast			
Time of decision	**Routes**	**Action**	**Time**

Informed Works Team		**ICELERT**		**Twitter**	
Called DC to action		**Called Farmers to action**			
Record of decisions/discussions					
Time	**Who with**	**Detail**			

Useful telephone numbers	
Forecaster (Meteo Group Weather Centre)	
Finlay Irvine 24hr help desk	
ITCC (Mon-Fri 7am to 5pm)	
Ringway Duty Officers / Contacts	See weekly rota sent by Ringway

Appendix I – EqIA – Winter Service

1. Who is completing the EqIA and why is it being done?

Title of service / proposal / project / strategy / procurement you are assessing	Winter Maintenance (Operational Plan)
Names of those involved in completing the EqIA	Richard Stacey/Ross Bevan
Head of Service or Business Manager	Steve Johnson
Team/Department	Winter Service, Highways
Lead officer contact details	
Focus of EqIA – what are you assessing?	The Winter Service Operational Plan is reviewed every year prior to the Winter Season. Every highway authority should have a Winter Service Plan that contains the information laid out in "The Code of Practice Well Managed Highways Infrastructure', as set out in two elements of legislation: 4. Section 41 (1A) of the Highways Act 1980, which was modified on 31st October 2003, by Section 111 of the Railways and Transport Act 2003. The first part of Section 41 now reads:

	a) *The authority who are for the time being the highway authority for a highway maintainable at the public expense are under a duty, subject to subsections (2) and (3) below, to maintain the highway.* *b) (1) In particular, a highway authority are under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice."* This is not an absolute duty, given the qualification of "reasonable practicability" but it does effectively overturn previous legal precedence, albeit not with retrospective affect. 5. Section 150 of the Highways Act 1980 still imposes a duty upon authorities to remove any obstruction of the highway resulting from *"accumulation of snow or from the falling down of banks on the side of the highway, or from any other cause"*. In addition, the Traffic Management Act 2004 placed a network management duty on all local traffic authorities in England. It requires authorities to do all that is reasonably practicable to manage the network effectively to keep traffic moving. In meeting the duty, authorities should establish contingency plans for dealing promptly and effectively with unplanned events, such as unforeseen weather conditions, as far as is reasonably practicable. The plan must also comply with the general duty imposed by Section 41 of the Highways Act 1980- to maintain those highways maintainable at public expense in a safe condition.

	Hertfordshire County Council therefore undertake to provide a winter maintenance service which, as far as reasonably practical, will permit safe movement of traffic and minimise delays and accidents directly attributable to adverse weather conditions. Its resource levels and operations are based upon an average winter season based upon historical data from previous winters. HCC's Winter Operation takes a reasonably practicable approach to removal of snow and ice from Highways. The purpose of this EqIA is to lead a strategic approach to the development of the County's economy, allow the safe and expeditious movement of traffic and goods, manage allow and sustain and Improve journey reliability.
Stakeholders Who will be affected? Which protected characteristics is it most relevant to? Consider the public, service users, partners, staff, Members, etc	All highway users and those who rely on deliveries etc. including: Citizens of Hertfordshire – Service users Road users of Hertfordshire traveling in and throughout the county Emergency services Elected members. HCC staff WCS Staff Ringway Staff Most if not all residents will benefit from the Winter Service.

2. List of data sources used for this EqIA *(include relevant national/local data, research, monitoring information, service user feedback, complaints, audits, consultations, EqIAs from other projects or other local authorities, etc.)*

A range of useful local data on our communities can be found on Herts Insight and on the Equalities Hub

Title and brief description (of data, research or engagement – include hyperlinks if available)	**Date**	**Gaps in data** Consider any gaps you need to address and add any relevant actions to the action plan in Section 4.
Service user feedback, complaints and general correspondence.	All year round	-
Diversity profiles from Herts Insight – able to inform us of the proportion of different groups living in the county and using the Highway.	Census information from 2011	Census data is 10 years out of date.
GIS data including location of key facilities, types of road, sensitive traffic network, bus routes, category of settlements – helps to make decisions about priorities and assess risk.	Latest P1 review was in 2018	-

Accident data, insurance claims data show how many accidents were associated with ice/snow on the highway, and where they took place. This can help to inform decisions.	Accident data is tracked all year round	Data not disaggregated by protected characteristics. DfT data does not record non-collision non-motor vehicle accidents e.g pedestrian slips and trips. Not all accidents will lead to an insurance claim.
Event Analysis undertaken for 2014 showed that of the 525 schools in Hertfordshire, 191 are situated away (more than 50m by road, or 10m by footway) from a precautionary or post salting route.	2014	-
Audits, KPIs, annual reviews with key stakeholders. Hertfordshire currently salts around 43% of the highway network as a precautionary (Priority 1, 2(a) & 2(b)), A further 644Km (around 13%) of highway is on HCC's post treatment routes (priority 3).	Annual	-

3. Analysis and assessment: review of information, impact analysis and mitigating actions

Protected characteristic group	**What do you know?** **What do people tell you?** Summary of data and feedback about service users and the wider community/ public • **Who uses the service?** • **Who doesn't and why?** • **Feedback/complaints?** • **Any differences in outcomes? Why?**	**What does this mean – what are the potential impacts of the proposal(s)?** - Consider positive and negative impacts - On service users / the public - *AND, where relevant,* ***staff**** ***** if your proposals relate mainly to a staff restructure or reorganisation, you should use the template here***	**What can you do?** What reasonable mitigations to reduce or avoid the impact can you propose? How will you communicate/engage or provide services differently to create a 'level playing field' – e.g. consultation materials in easy read or hold targeted engagement events ***If there is no current way of mitigating any negative impacts, clearly state that here and consider other actions you could take in the action plan in section 4.***
Age	Herts Insight - Of the estimated total population of Hertfordshire at mid-2019; 245,413 (20.6%) were aged under 16. 62.2%	55+ Possible negative (associated with footway risks) Potential negative: younger people (17-25) & children, especially through school age.	Encourage Parish/Town councils, resident groups and district/boroughs to apply for free salt through the Winter Self Help scheme.

	were aged 16 to 64, and 204,227 (17.2%) are aged over 64.		Engage with schools to promote self-help offer of free salt for use on public highway.
Disability	Census 2011 tells us that 14.3% of residents are limited to some extent in their day to day activities they can undertake. Of which 6.2% had a long-term illness or disability that limited their day-to-day activities a lot. Whilst 8.1% of had a long-term illness or disability that limited their day-to-day activities a little.	Some slight negative impact risk associated with mobility and footway treatment, and/or with communication methods.	Provision of free salt through the Winter Self Help scheme to community groups, including those with users with disabilities. Provision of plans and communications in suitable formats for all. Discuss mediums with HCC Comms team, promote self-help, share locations of self-help facilities, during severe conditions prioritise response teams in line with demands. Communication in differing formats and languages. Cooperation with HCC facilities management Reference Easy Read – produce any documentation in Easy Read for service users with a learning disability.
Gender reassignment	Herts Insight - Data on Gender reassignment is not available at	No potential differential impacts found	None required.

	any areas lower than regional level.		
Pregnancy and maternity	Herts Insight - Data not available.	Possible impact associated with footway risk or necessary/frequent use of key facilities.	Promote forecast and prevailing weather and road conditions, support blue light services in event of emergency, liaise with Emergency Planning Teams during severe conditions, establish a snow desk where needed and review deployment of 4x4 for midwives and ambulance staff dependant of resource availability.
Race	Herts Insight (Census 2011) states that Hertfordshire's ethnicity is 87.6% white, 6.5% Asian / Asian British and 2.8% Black / African / Caribbean / Black British and 0.6% other	No potential differential impacts found	None required.
Religion or belief	Herts Insight (Census 2011) states that 58.3% of Hertfordshire is Christian, 26.5% have no religious beliefs, 7.2 did not state a religion, 2.8% were Muslim whilst Jews and Hindus recorded 1.9% each.	No likely differential impacts generally, however, there may need to pay special attention in certain situations – funerals and weddings	During severe conditions a snow desk is established to support those life events such as funerals and weddings. HCC decision makers will allocate resource as appropriate.

Sex/Gender	Herts Insight - 48.97% of Hertfordshire residents were Male and 51.03% Female at mid-2018.	No likely differential impacts	None required
Sexual orientation	Herts Insight - Data on sexual orientation is not available.	No likely differential impacts	None required
Marriage and civil partnership	Herts Insight - 52% of the population in Hertfordshire are married.	No likely differential impacts to people however, their plans may be affected due to severe weather conditions	During disruption by severe conditions; snow desk to assign resource if available
Carers	Herts Insight - 6.8% of Hertfordshire residents in 2011 census provided 1 to 19 hours of unpaid care a week. 1.1% of Hertfordshire residents provided 20 to 49 hours of unpaid care a week. 1.1% of Hertfordshire residents provided 20 to 49 hours of unpaid care a week. 1.9% of Hertfordshire residents provided 50 or more hours of unpaid care a week.	Possible impact due to being associated with specific protected characteristics. Disability, older people who require care for example	Ensuring Links to Local Voluntary services are in place via HCC Emergency planning team.
Other relevant groups	No other relevant groups.	No likely differential impacts	None required.

Consider if there is a potential impact (positive or negative) on areas such as health and wellbeing, crime and disorder, Armed Forces community.			

Opportunity to advance equality of opportunity and/or foster good relations	
Community engagement such as school visits, presentations, information days and press release, use of social media.	
Conclusion of your analysis and assessment - select one of the outcomes below and summarise why you have selected i, ii, iii or iv; what you think the **most important** impacts are; and the key actions you will take.	
OUTCOME AND NEXT STEPS	**SUMMARY**
i. No equality impacts identified - No major change required to proposal	
ii. Minimal equality impacts identified - Adverse impacts have been identified, but have been objectively justified (provided you do not unlawfully discriminate) - Ensure decision makers consider the cumulative effect of how a number of decisions impact on equality - No major change required to proposal	*Minimal equality impacts have been identified due to differing levels of vulnerability to ice/snow-related risk on the footway.* *However, these footway risks are covered by other areas of the winter service operational plan, such as the provision of salt bins (with particular attention paid to proximity to sheltered housing, healthcare facilities, schools, and other services) and the supply of free salt for community self-help (for resident groups, parish/town councils and districts/boroughs).*
iii. Potential equality impacts identified - Take 'mitigating action' to change the original policy/proposal, remove barriers or better advance equality	

- Set out clear actions in the action plan in section 4.	
iv. Major equality impacts identified - The adverse effects are not justified, cannot be mitigated or show unlawful discrimination - You must stop and remove the policy **[you should consult with Legal Services]** - Ensure decision makers understand the equality impact	

4. Prioritised Action Plan

Impact identified and group(s) affected	**Action planned** Include actions relating to: **• mitigation measures** **• getting further research** **• getting further data/consultation**	**Expected outcome**	**Measure of success**	**Lead officer and timeframe**
NB: These actions must now be transferred to service or business plans and monitored/reviewed to ensure they achieve the outcomes identified.				
No footway treatment: Impact on some age groups, some disabilities, possible impact on maternity/ pregnancy.	Monitoring of insurance/accident data to identify any consistent footway risks. Collection of relevant data. Review of salt bins on regular basis. Tracking of any fault logs / requests. Continued support for the Winter Self Help scheme.	Self-Help measures to make footways safer in residential areas or areas of particular risk or importance to the local town/parish.	Viewing insurance data to ensure there is no increase in claims or repeated claims for accidents in the same location.	Ross Bevan Ongoing throughout Winter Season.

Communications materials: potential impact on some users with learning difficulties	Provision of plans and communications in suitable formats for all (accessible).	All service users able to access, use and benefit from communications.	Tracking any requests, complaints or feedback.	Ross Bevan and also Highways Communications Team Ongoing throughout Winter Season.
Communication materials: users who do not speak English.	Staff aware of how to access translation services when required.	All service users able to access, use and benefit from communications.	Tracking any requests, complaints or feedback.	Ross Bevan and also Highways Communications Team Ongoing throughout Winter Season.

This EqIA has been signed off by:

Lead Equality Impact Assessment officer: **Date:**

Head of Service or Business Manager: **Date:**

Review date:

Appendix J: Sustainable Hertfordshire Impact Assessment Form

Name of person completing this form	Richard Stacey – Reviewed Ross Bevan
Date completed	23rd June 2021 Reviewed May 2023

1. About the project, service or policy

Name of project, service, policy or procurement	Winter Service
Name of project sponsor	Jon Prince
Name of project lead or business manager	Ross Bevan
Project Timeline	Ongoing

Why is this project needed?

The winter service operational plan is required as the law states that it is the Local Authorities responsibility to demonstrate that their policy is reasonable and meets their statutory duties in respect of the risks to road users posed by snow and ice.

There are environmental consequences from winter services through the use of diesel powered gritters and the spreading of salt, but there is no alternative to treating the roads to comply with our legal duty. The proposal for the Winter Service Operational Plan is for little change from previous years and so in terms of change the impact is neutral, but the impact assessment identifies the greatest sustainability impacts from the winter service operation.

Legal requirement

Section 41 (1A) of the Highways Act on the 31st October 2003, by Section 111 of the Railways and Safety Transport Act 2003.

Traffic Management Act 2004

Section 150 of the Highways Act 1980

2. Sustainability Impact

Consideration –Greenhouse Gas Emissions	**Assessment of Impact:** ***Negative*** ***Neutral*** ***Positive***	**Brief description of impact**	**If negative, how can it be mitigated or adapted?** **If positive, how can it be enhanced?**
Biodiversity	Negative	The winter service operation plan proposes little change to current operations, but salt can affect vegetation which grows at the side of the road, affecting species habitats.	Salt is spread on roads to reduce ic risk. There may be opportunities with the procurement of the highways services contract in 2024 to consider changes to the winter service.
Energy	Negative	The winter service operation plan proposes little change to current operations, and so the impact has been recorded as neutral although the gritters are diesel powered.	There are currently no viable alternatives to diesel powered gritters, but there may be opportunities with the procurement of the highways services contract ir 2024 to build in sufficient flexibility for contractors to migrate to other forms of powered vehicle if technological advances make that a viable proposition.
Green Economy & Employment	Neutral	The winter service operation plan proposes little change to current	

		operations, and so the impact on green economy and employment is neutral.	
Pollution	Negative	Each gritting run covers over 40% of the local road network in Hertfordshire, and the gritters are diesel powered and spread salt on the highway.	There are currently no viable alternatives to diesel powered gritters, but there may be opportunities with the procurement of the highways services contract in 2024 to build in sufficient flexibility for contractors to migrate to other forms of powered vehicle (e.g., hydrogen or electric) if technologica advances make that a viable proposition.
Products, Materials & Contracts	Negative	The winter service operation plan proposes little change to current operations	Difficult to improve as there are only 2 salt mines in England, in Cheshire and in Cleveland, and salt needs to be delivered to local depots for the winter service. There are no viable alternative products to using salt bu there are a range of different salt products on the market, and technical decisions about the spread-rates needed to reduce ice formation, and the weight of salt to be used on each gritting run.
Transport	Negative	Negative because of the number of miles driven to grit roads and transport salt to depots (despite this there is little change to current operations, and so the impact on Transport is similar to previous years).	There are currently no viable alternatives to diesel powered gritters, but there may be opportunities with the procurement of the highways services contract in 2024 to build in sufficient flexibility for contractors to migrate to other forms of powered vehicle (e.g.,

			hydrogen or electric) if technologica advances make that a viable proposition.
Water	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Water has been recorded as neutral. Some water required to wash down vehicles after salt spreading.	
Waste	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Waste is neutral	
Consideration – Social Impact	Assessment of Impact: *Negative* *Neutral* *Positive*	Brief description of impact	If negative, how can it be mitigated or adapted? If positive, how can it be enhanced?
Awareness & Behavioural Change	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Awareness and Behaviour Change is neutral	

Health	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Health is neutral. The Winter operation is designed to improve safety by reducing the formation of ice on roads, and so has a positive overall effect on Health in that it avoids road traffic accidents.	
Consideration - Resilience to Climate Change	Assessment of Impact: *Negative* *Neutral* *Positive*	Brief description of impact	If negative, how can it be mitigated or adapted? If positive, how can it be enhanced?
Drought	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Drought is neutral	
Flooding	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Flooding is neutral	

Heatwaves	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Heatwaves is neutral	
Storms	Neutral	The winter service operation plan proposes little change to current operations, and so the impact on Storms is neutral	

3. Action plan

Impact identified	Action to Reduce Negative Impact or Enhance Positive Impact	Timeframe/Date	Lead Officer
Consider reducing the number of outings, the spread rate, and the use of more environmentally friendly fuel sources and vehicles when the new highways contracts are procured.	Positive	2024 Contract	Steve Johnson

4. Sign off

	Name	Date
Head of Service/Business Manager	Steve Johnson	21/06/2021
Director	Anthony Boucher	25/06/2021