Scottish Trunk Road Network Management Contract

South East Unit

Winter Service Plan
Plan: SE-WSPlan

31 July 2024

BEAR Scotland Limited
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13	NE Operating Company Severe Weather Manager	

14	NW Operating Company Severe Weather Manager	
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Electronic copy distributed as above.
The most up-to-date version of this Winter Service Plan is available electronically to appropriate staff on the BEAR Scotland intranet system.

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Introduction

This is the Winter Service Plan (WSP) provided under the Scottish Trunk Road Network Management Contract for the South East Unit, which will operate from 16 August 2020 for the initial Contract Term until to 15 August 2028.

Within this WSP, the term “Network Maintenance Contract” refers to the above Contract.

This WSP has been developed in full compliance with the requirements set out in Schedule 2 Appendix 6 of the NMC and with reference to the “Manual for the Management of the Risk of Unplanned Network Disruption” and details how BEAR Scotland will provide the Winter Service on the South East Unit.

This WSP covers the following trunk roads in Scotland:

- **M8/A8 Edinburgh - Greenock Trunk Road** from its junction of the A720 at and including Hermiston Roundabout Edinburgh leading generally westwards for a distance of 41 kilometres or thereby to the junction of the A8 with the M8 at Newhouse, including that part of the said Trunk Road branching generally north-eastwards west of Edinburgh for a distance of 2 kilometres or thereby to its junction with the M9 south of Newbridge Roundabout Edinburgh.

- **M90/A90 Edinburgh – Fraserburgh Trunk Road** from the M9 Junction 1A at Humbie leading generally north for a distance of 18 kilometres or thereby to the M90 Junction 3 at Halbeath including the Queensferry Crossing and incorporating the A90 section from M90 Junction 1 to M90 Junction 1A.

- **M90/A90 Edinburgh – Fraserburgh Trunk Road** from A90 Dalmeny leading generally westwards for a distance of 1 kilometre or thereby to A90 Scotstoun Junction/M90 Junction 1.

- **A9000 Queensferry – North Queensferry** from A90 Echline Junction generally northwards for a distance of 4.2 kilometres or thereby to M90 Ferrytoll Junction 1B, including the Forth Road Bridge.

- **A823(M) Pitreavie Spur Trunk Road** from its junction with the M90 Junction 2 at Masterton leading generally westwards for a distance of 1.5 kilometres or thereby to its junction with the A823 but excluding Pitreavie Roundabout Dunfermline.

- **M9/A9 Edinburgh - Stirling - Thurso Trunk Road** from its junction with the M8 south of Newbridge Roundabout Edinburgh leading generally north-westwards for a distance of 52 kilometres or thereby to its junction with the A9 at but excluding Keir Roundabout Stirling and including Bannockburn Roundabout Stirling (M9 Junction 9).

- **M80 Glasgow – Stirling Trunk Road** from the M80 Junction 4 Haggs leading generally north-eastwards for a distance of 31 kilometres to its junction with the M9 at Bannockburn Interchange Stirling (M9 Junction 9).

- **M876/A876 Dennyloanhead – Kilbagie Roundabout Trunk Road** (1) from its junction with the M80 at Bankhead Interchange Dennyloanhead Falkirk leading generally north-eastwards for a distance of 9 kilometres or thereby to its junction with the M9 at Hill of Kinnaird Interchange Stenhousemuir (M9 Junction 8); and (2) from its junction with the M9 at Kinnaird House Interchange Stenhousemuir (M9 Junction 7) leading generally

north-eastwards for a distance of 8 kilometres or thereby to the termination of the A876 at the Kilbagie Roundabout.

- **A1 Edinburgh - Berwick Upon Tweed Trunk Road** from a point lying to the west of its junction with the A720 at Old Craighall Edinburgh leading generally eastwards for a distance of 77 kilometres or thereby to the Scotland – England border. The main carriageway and slip roads of the A1 as follows have special road status. The main carriageways and designated slip roads from a point 70 metres east of the point where the B6415 crosses under the A1 at Old Craighall to the western edge of Thistly Cross Junction.

- **A720 Edinburgh City Bypass** from its junction with the A1 at and including Old Craighall Roundabout Edinburgh leading generally westwards for a distance of 22 kilometres or thereby to a point lying to the north of its junction with the M8 at Hermiston Interchange Edinburgh. The length of main carriageways and slip roads of the A720 as follows have special road status. The main carriageways and designated slip roads from the junction with the M8 at Hermiston Gait as shown, at its junction with Calder Road and to its junction with the A1 at Old Craighall and including the Sheriffhall roundabout.

- **A6091/A7 Melrose - Galashiels - Carlisle Trunk Road** from its junction with the A68 at but excluding Ravenswood Roundabout Newtown St. Boswells leading generally south-westwards for a distance of 86 kilometres or thereby to the Scotland – England border.

- **A68 Edinburgh - Newcastle Upon Tyne Trunk Road** from its junction with the A720 at the Millerhill Junction leading generally south-eastwards for a distance of 83 kilometres or thereby to the Scotland – England border.

- **A702 Edinburgh - Abington Trunk Road** from its junction with the A720 at and including the northernmost roundabout at Lothianburn Junction Edinburgh leading generally south-westwards for a distance of 59 kilometres or thereby to its junction with the A74(M) at and including the west most roundabout leading on to the A74(M) at Abington Interchange (A74(M) Junction 13).

- **A985 Kincardine - Rosyth Trunk Road from Higgins' Neuk Roundabout** generally eastwards for a distance of 22 kilometres or thereby to its junction with the M90 at and including Admiralty Roundabout (M90 Junction 1).

- **A977 Gartarry Roundabout – Kincardine Trunk Road** from and including the Gartarry Roundabout, Clackmannanshire, to and including the Toll Road junction where it meets the A876, and then on to the junction with the A985 at the Longannet Roundabout, Kincardine, a distance of 5 kilometres or thereby.

The purpose of this WSP is to show how BEAR Scotland will:

- Plan its winter service operations for dealing with forecast and actual winter conditions on or near to the South East Unit.

- Carry out its winter service operations.
- Minimise, where possible, the duration of any winter weather incidents and their impact.
- Identify and deliver mitigating measures to prevent the occurrence of winter weather incidents as per Schedule 2 Section 6.1.8. Whilst individual reviews can be undertaken the Disruption Risk Workshops as detailed in 3. Schedule DRMP1 – Incidents Data and Risk Registers within the Disruption Risk Management Plan provides a framework for problems/solutions to be discussed/recorded/actioned.

This WSP is a controlled document within BEAR Scotland's Quality Management System.

The WSP will be kept under review prior to and during the Winter Service Period, any proposed amendments shall be submitted to and approved by the Director prior to being incorporated in the WSP.

This WSP will be distributed on first issue and on each re-issued as detailed on Page 3.

The WSP is part of the overall Disruption Risk Management Plan (DMRP). The relationship between the DRMP, WSP and other supporting plans and records is shown schematically in Figure

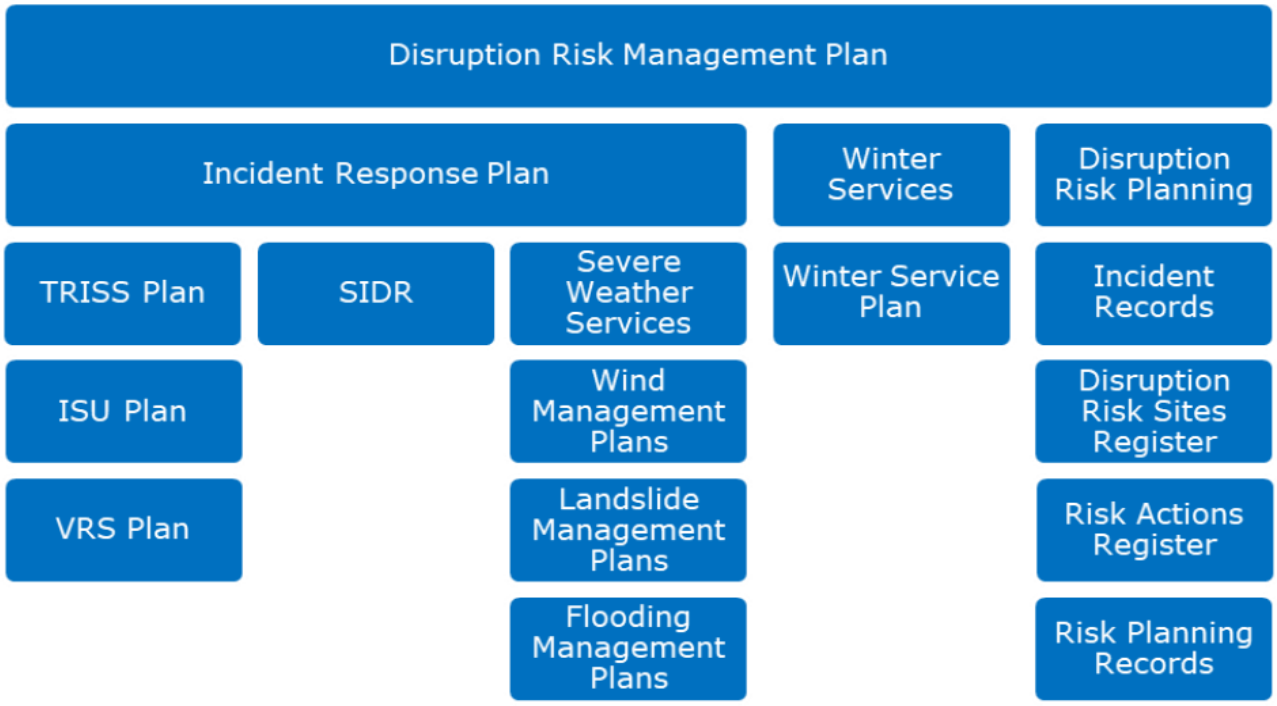


Figure 1

Item 1 – Management Arrangements

1.1 Severe Weather Manager

1.1.1 Name

The Severe Weather Manager (SWM) will be xx xx (xx@bearscotland.co.uk).

1.1.2 Qualifications

xx has:

- BEng Transportation Engineering
- CSCS Professionally Qualified Person
- Chartered Member of the Institution of Highways and Transportation
- Certificate of Professional Competence in Fleet Management
- Conversant with the Appendix H Winter Service Practical Guidance

1.1.3 Experience

xx has been involved in winter service operations throughout his time on the 2G, 3G and 4G Contracts and was the Winter Service Manager for the SE Unit during the 2012/2013 and 2013/2014 winter seasons.

xx was the North East Winter Service Manager from January 2018 until the end of the 2019/2020 winter season and has been the SWM for the SE Contract since it started in 2020. He is responsible for the preparation of the Winter Service Plan, preparation of the winter fleet, training of winter operational staff and training/mentoring of Winter Service Duty Officers.

His experience and training allows him to advise and mentor the Winter Service Duty Officers through the decision making process ensuring that daily winter action plans are in compliance with the Contract requirements and effective in keeping the road network free from ice and snow.

1.1.4 Responsibilities

The SWM is responsible for producing the Winter Service Plan for consent by Transport Scotland. The SWM is responsible for the operation, review and development of that Plan throughout the winter season, thus ensuring the Operating Company fully discharges its responsibilities under the Contract.

The SWM/WSDOs are responsible, on behalf of the Operating Company, for winter maintenance activities including:

- collection and management of weather data
- maintaining salt stock levels and their storage facilities
- achieving response times for precautionary treatment, patrols and snow clearance
- plant and communications
- the Road Weather Information System (RWIS), weather forecasting service and weather radar system

- training of staff and operatives
- preparation and updating of rotas for duty staff
- maintaining electronic records and manual records
- providing an annual winter service report
- liaising with third parties
- communication with Transport Scotland during severe weather events
- participation in conference calls with Transport Scotland as required
- implementing additional resources when required
- reporting weekly salt stock levels to the Scottish Salt User Group through the DfT portal
- ensuring completion of Daily Action Plans and uploading to Vaisala Manager

1.2 Winter Service Duty Officers (WSDOs)/Duty Severe Weather Managers/Incident Liaison Officers (ILOs)

1.2.1 Names

WSDO's are:

- xx xx
- xx xx
- xx xx
- xx xx
- xx xx
- xx xx
- xx xx

After completing the IHE course in June 2024 the member of staff listed below will be mentored throughout this winter season to assist development as a future WSDO.

- Xx xx

1.2.2 Qualifications

All WSDOs have undertaken suitable training in relation to winter service decision making and weather forecast interpretation, including subjects such as road meteorology and winter service computer systems.

Xx xx – Has worked as a WSDO for 10 year's moving to the SE Unit during season 2021/22, he previously worked in the NE Unit. Mike has completed IHE, Vaisala and Meteo Group Winter training. As well as being a WSDO Mike will also undertake the role of Assistant Severe Weather Manager, deputising for the Severe Weather Manager as and when required.

Xx xx –14 years road maintenance experience, 8 years WSDO experience in SE and completed IHE Winter Decision Makers' Course in February 2017.

Xx xx – 17 years WSDO experience, Met Office Open Road Training September 2014, Vaisala Road DSS Navigator Training September 2018

Xx xx – 9 years experience in trunk road maintenance with 5 years experience as an approved WSDO having worked in the NW Unit prior to moving to the NMC. He has completed both Vaisala training and the IHE Winter Decision Makers Course.

Xx xx – 3 years experience working as a WSDO having completed the IHE Winter Course in Autumn 2021

Xx xx - Completed the IHE Winter Course in Autumn 2022 and assisted more experienced WSDO's during the 2022/23 and 2023/24 winter seasons.

Xx xx – Completed the IHE Winter Course in 2023 and assisted more experienced WSDO's during the 2023/24 winter season, first season as a WSDO and will be mentored by the SWM or Assistant SWM

Xx xx – Completed the IHE Winter Course in June 2024 and will assist more experienced WSSO's and be mentored by SWM and Assistant SWM for his first season.

1.2.3 Experience

WSDOs will either have a minimum of 4 years' relevant experience or have passed the IHE Winter Decision Makers Course ensuring competent and consistent winter decision making.

1.2.4 Responsibilities

The SWM will be supported by 8 no. WSDO's working on a rotational basis. These posts are an integral part of the service as they provide immediate support and guidance to the Network Hub staff, allowing them to process the information being received whilst the WSDO interpret the forecast, make decisions on treatment and prepare the Daily Action Plan. The WSDO is solely authorised to take decisions and issue instructions to direct the Winter Service.

The on duty WSDO shall be located and on duty in the Central Office Network Hub during the Winter service period when the road surface temperatures are forecast to be below 3^{o}C. During periods of severe weather additional staff will assist in the Network Hub.

All WSDO shall have previous experience of monitoring the road sensor system and making decisions on treatment resulting from the receipt of the forecast information from the supplier.

All the WSDO named will be fully trained in basic road meteorology including the use, and interpretation, of ice prediction systems.

As part of their duties the WSDO will also monitor conditions on the M80 DBFO and liaise with M80 DBFO winter drivers. In the event of changes to initial forecast conditions or should any treatment related issues arise the SE WSDO will contact the M80 DBFO WSDO/WM, any decision making is the responsibility of the M80 DBFO WSDO/WM.

1.2.5 Duty Severe Weather Manager

Over and above the contractual requirements there will be a Duty Severe Weather Managers' rota to assist the Severe Weather Manager/ Assistant Severe Weather Manager in supporting the WSDOs as required. The 2 named below have significant experience in Winter Service.

The Duty Severe Weather Managers are:

- Xx xx
- Xx xx

1.2.6 Journey Time Reliability Co-ordinator/Incident Liaison Officer – Network Hub (JTRC/ILO)

The JTRCs/ILOs will be based in the Network Hub. The Network Hub is staffed by a team of approved JTRCS/ILOs(Network Hub) working to 4 days on, 4 days off shift pattern that ensures it is operated on a 24 hours a day, seven days a week basis.

The JTRCs/ ILOs are:

Xx xx, xx xx, xx xx…….

The JTRCs/ILOs will assist the WSDO in providing the winter service in an administrative capacity.

JTRCs/ILOs will assist the WSDOs in maintaining and updating of operational records including the following:

- treatment records and patrol records
- material usage
- road closure locations and times
- logs of communications to and from vehicles on route & any other sources
- software faults
- electronic data from data loggers
- reserve and additional plant paper records
- social media updates
- upload of Daily Action Plans to CMS

1.3 Monitoring Arrangements

1.3.1 Monitoring arrangements during normal working hours

Monitoring will be carried out by staff in the Network Hub from 1 October to 15 May 24/7, including

- Contact with expert weather forecast provider including “change triggers”
- Feedback from inspectors during normal working hours
- Monitoring of weather sensors
- Compilation of daily action plan
- Monitoring Road Surface Temperatures (RSTs) trend against forecast
- Use of weather and Traffic Scotland cameras
- Weather radar
- Communications from external parties.
- Mobile road condition monitoring data and camera images will be relayed to the Network Hub and the Traffic Scotland National Control Centre via a web-based application
- Feedback from patrols and other drivers

- Monitoring snow and ice formation (accretion) on the structures of the Queensferry Crossing and Forth Road Bridge – See Appendix WSP11

1.3.2 Monitoring arrangements outwith normal working hours

The South East Unit Network Hub will be based at BEAR Scotland's South Queensferry Office and will be staffed on a rotational basis 24/7.

The contact number for the Network Hub is:

0131 374 2424

The Network Hub will have access to all relevant contact phone numbers and winter maintenance systems such as Vaisala Bureau, specialist forecasts from MetDesk, Locatu, communications log database and weather radar.

When the road surface temperature is forecast to be below 3^{o}C the WSDO will be on duty in the Network Hub as required by Schedule 2 Section 6.2.10 of the NMC.

There will also be a dedicated telephone line for Police Scotland within the Network Hub. This allows direct contact at all times between Police Scotland and staff in our Network Hub. This number will only be issued to Police Scotland.

1.4 Personnel Resources

The resources detailed below will be the minimum numbers involved in delivering the winter service:

- 1 No. Severe Weather Manager, supported by the Assistant SWM/ Duty Severe Weather Managers
- 7 No. Winter Service Duty Officers and 1No. WSDO being mentored
- 9 No. Winter Service Duty JTRCs/Incident Liaison Officers
- 88 No. Winter drivers (See Appendix WSP24 – Winter and Patrol drivers)
- 26 No. Patrol drivers (see WSP24)

1.5 Call-Out Arrangements

1.5.1 Call-out arrangements during normal working hours

A winter rota will be prepared at the beginning of the winter season for staff and operational staff involved in the winter service. Rotas are available in BEARnet using hyperlink below.

https://bearscotland.sharepoint.com/:f:/r/SE%20Records%20Referencing%20System/05/02?csf=1&web=1&e=WbhsPe

Any changes to the rota will be communicated to the relevant parties involved in providing the winter service.

At all times it will be the responsibility of the duty WSDO to ensure that a clear line of communication is kept to all key personnel involved in providing the winter service for that week.

It is anticipated that the requirement for call-out will be minimal from the beginning of November until the end of March, when a dayshift/nightshift system will be in place, with drivers immediately available on the Unit 5 days per week during the normal working week. Outside this period there will be 24-standby covered by two shifts.

From 1 October to 31 October and 1 April to 15 May a 24hr driver standby rota will be in place.

In the event of a winter conditions being forecast between 16 May and 30 September standby arrangements will be put in place as per Schedule 2 Section 6.1.4 of the NMC.

1.5.2 Call-out arrangements outwith normal working hours

It is the role of the WSDO to ensure the appropriate drivers are contacted and advised of the required winter action treatment. The personnel on the rota shall be available to mobilise and commence treatment on the carriageway within 1 hour of being contacted.

1.5.3 Contact arrangements during normal working hours

Each individual involved in providing the winter service shall be issued with a mobile phone to allow easy contact. When drivers are on winter duty for any given week, cognisance of this will be taken into account when planning normal daily duties. This will ensure that drivers still have the ability to respond quickly to any call to carry out a winter service action at short notice within the contractual response times.

1.5.4 Contact arrangements outwith normal working hours

As 1.5.3 above on-call drivers will be supplied with mobile phones.

1.5.5 Mobilisation Times

Depots have been positioned in locations where both the Trunk Road precautionary treatment routes and drivers are easily accessible; this ensures that drivers are consistently able to access the start of each precautionary treatment within one hour of a call from their home. To assist in the speed of access to the gritting routes, spreaders may be pre-loaded on any night when action is a possibility.

1.6 Communications Equipment

Good communication systems are essential for effective winter maintenance management and the following systems will be adopted to meet the requirements of the Winter Service:

- Push To Talk radio (PTT) to Schedule 5 Clause 2805AR is fitted to all winter maintenance vehicles to aid communication, particularly in severe weather

- telecommunications – mobile
- satellite tracking of BEAR Scotland vehicles
- e-mail
- internet – refer Communications Plan
- social media e.g.X, Instagram, WhatsApp etc - refer to Communications Plan
- MS Teams/Zoom conference calls

All depots will be contactable by mobile telephone, email and Microsoft Teams. In addition, all managers, supervisors, and winter maintenance operational staff will have mobile telephones so that they can be contacted at all times. In the case of winter maintenance vehicles, Bluetooth hands-free systems will work with the PTT radio and mobile phones.

BEAR Scotland vehicles are fitted with an integrated satellite tracking system (Locatu) to deliver communications needs, management system and produce an auditable trail of actions undertaken. This information will also be available via an approved app to Schedule 5 Clause 2804AR.

1.7 Training for Managers and Other Staff

1.7.1 Details of previous training

All current WSDOs have been trained in basic road meteorology and winter service computer systems. Depending on experience some WSDOs will attend the IHE Winter Decision Makers' Course. All winter drivers will be trained to SVQ/City & Guilds level or equivalent in winter maintenance.

1.7.2 Details of proposed training

Prior to the commencement of the winter season, refresher training will be carried out for all personnel involved in providing the winter service. All training will be recorded. The SWM is responsible for organising all winter training. This will include the following:

- Internal refresher training for WSDOs on decisions, communication, contract requirements etc;
- Pre-season briefing for Operations Managers and Supervisors
- Pre-season briefing for winter drivers detailing treatment routes, Contract requirements, response times, treatment times, communication, health and safety and vulnerable areas;
- Practical training on route familiarisation and plough fitting;
- New recruits to the winter service will be fully trained prior to any involvement in providing the winter service and mentored.
- Dry runs of all precautionary treatment routes will be undertaken prior to the start of each winter period.

BEAR Scotland staff will also participate in the annual "snow desk" winter scenario training when requested to do so by the Director.

Item 2 – Weather Forecasting

2.1 Purpose

The meteorologists working for the expert weather forecasting service provider supply an accurate indication of weather conditions so that the personnel involved in the provision of winter service are able to prepare a winter action plan which shall prevent or anticipate prevailing weather conditions and allow sufficient time to pre-treat the carriageway prior to the onset of snow or ice.

2.2 Methodology

Weather models are used to produce both the short-range and long-range weather forecasts.

The road model forecasts can be updated as frequently as necessary using actual data from road sensors and data from comprehensive meteorological databases. These are monitored and updated by forecasters around the clock.

2.3 Weather Forecasting Service

The expert weather forecasting service will be provided by MetDesk.

MetDesk,
3 Station Approach,
Wendover,
Aylesbury,
Buckinghamshire,
HP22 6BN

www.metdesk.com

The service shall consist of the following:

- 36 hour forecast text (midday)
- 36 hour forecast graphs for each forecast station within South East Unit
- Evening updates to both 36 hour text & forecast graphs
- 2-10 day text forecast (provides early warning of severe weather)
- Forecast consultancy service for advice 24/7.

Weekly weather forecast accuracy reports will be provided by 1200 hours on the first working day of the following week as per Schedule 2 Section 6.1.18 (d).

The above will allow the WSDO to prepare a daily winter action plan each day which must be uploaded to the Traffic Scotland Service Website via CMS by 1400 hours, advising of all carriageway pre-treatments to be carried out for that day. The DAP will be shared with relevant Stakeholders electronically.

2.3.1 Climatic Domains

Route based climatic domains are related to the 20g treatment routes. Route specific temperature forecasts are provided for each day of the Winter Service season. See APPENDIX WSP10 FORECAST DOMAINS

Domain Number	Route	Location
1	A7	Terrona
2	A68	Soutra
3	A1	Grantshouse
4	A720	Swanston
5	A702	Abington
6	M8	Whitburn
7	M80	Haggs
8	M90	Halbeath
9	M90/A9000	Forth Road Bridge NW

Figure 2

2.3.2 Weather Radar

The WSDOs will have access to a web-based radar facility provided by MetDesk, 24 hours a day, seven days a week, throughout the winter season to supplement forecast information. The radar improves the accuracy of assessing the timing, nature and intensity of precipitation, particularly snowfall.

2.3.3 Weather Stations, Forecasts Sites and Camera Sites

Sensors are strategically placed throughout the network. The sensors/ cameras are polled every 10 minutes between 1 October and 15 May. Weather forecast sensors have added functionality to allow modelling of the temperature characteristics of the road pavement. They assist in producing road-specific weather forecasts. The system also provides audible warnings/ alarms which require to be acknowledged by the WSDO.

Sensors are calibrated twice per year (prior to start of season and during the winter season) and their performance monitored electronically with any issues being checked out on site, as required.

All road sensors and weather prediction equipment use an open protocol based on the Department of Transport TR2020C Protocol and Traffic Scotland Datex II or other open access protocol as required by Schedule 2 Clause 6.2.6. This allows all the sensor data and camera images to be delivered to the Traffic Scotland Service website throughout the Contract period

2.3.4 Thermal mapping

Currently it is not proposed to use thermal mapping for decision making.

2.3.5 Location plan

See Appendix WSP4

2.4 Computer Systems

There are a number of computer systems used to interrogate forecast and sensor data to enable the SWM and WSDOs to make the most appropriate decisions. These systems include:

- Bureau service – for collection of weather sensor data. The bureau service is provided by Vaisala. The central database collects data from weather sensors at 10-minute intervals.

- Vaisala RoadDSS Manager - this allows the winter staff to interrogate the bureau to give the most up to date conditions at the weather sensor locations on the trunk road network. This allows them to make informed decisions in relation to winter service actions and direct resources appropriately for road surfaces across the Unit and the structures of the major bridges. Forecasts can also be accessed from the bureau allowing daily action plans to be created, distributed and stored. These action plans are monitored against the forecasts. Daily winter action plans are input directly into RoadDSS Manager and are emailed to interested parties. Actual Actions are also recorded in the system. Reports of actual actions completed can be generated as required by running treatment and action reports for the required routes. The system also holds archive data.

- All patrol spreaders and frontline spreaders have a sensor to provide air temperature, road surface temperature and road surface state in real time and available in an archive. The information is also available to the driver of the vehicle on a display screen.

- A web-based system supplied by MetDesk will also be utilised to access forecast data along with weather radar images. Weather radar images are particularly useful for predicting and monitoring precipitation conditions.

- Locatu is a web-based system with live GPS vehicle tracking and storage of vehicle telemetry data including spreading data.

- BEARnet is BEAR Scotland's company intranet which holds all the Management System information and electronic records not held in Vaisala Manager or Locatu.

Item 3 – Arrangements and Mitigation Measures for Dealing with Vulnerable Locations

BEAR Scotland will, throughout the Contract duration review these areas and add or remove locations as per Schedule 2 Section 6.2.32. Permission will be sought from the Director to make any amendments at least once during each Annual Period. The review for season 2024/25 can be found in Appendix WSP30.
In the event of a Critical Incident resulting from a closure of a carriageway due to snow or ice the Director's consent may be requested to add to the list of Vulnerable Locations as Schedule 2 Section 6.2.32.
All staff involved in Winter Service will be instructed to pay particular attention to the areas below. Any problems identified will be reported back and added to the communications log.

Vulnerable locations are known locations on the Network where there are:

3.1 – Significant Gradient Areas

Road Number	Location
A7	Auchenrivock Improvement
A68	Soutra
M8	Livingston
A720	Calder to Baberton
A68	Carter Bar
A68	St Boswell to Ancrum

Figure 3

3.2 - Frost Susceptible Areas

Road Number	Location
M8	Junction 3 to Junction 5
A68	Huntsfords Bends to Carter Bar
A68	Pathead to Soutra Hill
A68	South of Soutra to Carfaemill Roundabout
A7	Newmills to Castle Hermitage Junction
A702	South of A703 Junction to North of West Linton
A702	Candymill to North of Coulter
A9000	Forth Road Bridge

Figure 4

3.3 – Water Runoff Areas

Road Number	Location
A1	Dunbar to Houndwood
A68	North of Fala
A7	North of Teviothead at Priesthaugh Junction to Skippers Bridge near Langholm includes area at sewage works
A702	Immediately North of Silverburn
A702	North of Abington

Figure 5

For both frost susceptible and known surface water run off locations, the ability to monitor and receive up-to-date road surface temperatures and states is critical. All patrol and frontline vehicles are fitted with road condition sensors providing live information to WSDOs/ILOs allowing all areas to be monitored closely. Each patrol driver is provided with a list of vulnerable locations on their route.

Arrangements and mitigation measures for dealing with individual vulnerable locations are detailed in Appendix WSP12.

Item 4 – Decision Making

4.1 Role of the Severe Weather Manager (SWM)

The role of the Severe Weather Manager is to ensure that all procedures detailed in the Winter Service Plan are adhered to and that the most effective action plans are adopted each day to keep the carriageways and footways free from snow and ice.

It is the duty of the SWM to hold regular reviews throughout the winter season to address any problems which may have occurred. This will take the form of briefings to all key staff on nights where difficult road conditions have been experienced. The philosophy will be to have a 'preventative' approach rather than 'reactive' approach in all decision making.

The SWM or Duty Severe Weather Manager will support the WSDO.

4.2 Role of the Winter Service Duty Officer (WSDO)

The WSDO is responsible for decision making, monitoring the ice detection system, monitoring Vaisala for any warnings or audible alarms and taking appropriate action, including updated forecasts and any dialogue with weather forecasters, to assess whether any changes are required to the daily action plan. Where any changes to the daily action plan are considered necessary then the WSDO will relay this information to the Depot Supervisors, confirming the decision.

Precautionary treatments will be undertaken where the road surface temperature is forecast to be less than or equal to 1ºC.

When snow is forecast the WSDO shall consider the forecast elevations of snow using Appendix WSP13 when making the planned treatment decisions.

4.2.1 Winter Service Patrol Mobilisation

From 1 November to 30 April the requirement to carry out a Winter Service Patrol will be established as part of the preparation of the daily action plan and instruction will be given as appropriate in accordance with Schedule 2 Section 6 where the road surface temperature is forecast to be less than or equal to 3ºC. During season's 2021/22, 2022/23 and 2023/24 a trial was undertaken where the patrol activation temperature was reduced to +2ºC. This resulted in significant carbon savings. TS has issues an contract change to reflect this trial and patrol activation is now less than or equal to +2 ºC.

As per Schedule 2 Section 6.2.21 the winter service patrols shall:

(i) patrol all carriageways of trunk roads of the Unit except slip roads;
(ii) report on road conditions encountered to, and take instructions on treatments from WSDOs;
(iii) provide an immediate response when instructed to carry out treatments or other de-icing operations by the WSDO;
(iv) deal with any situation on the winter service patrol route requiring immediate attention;
(v) pay particular attention to the areas identified in Schedule 2 Appendix 6 Winter Service Attachment 6.7 Location of Known Vulnerable Locations;
(vi) undertake short stops for minor maintenance activities such as clearing grips and removing debris; and

(vii) provide daily reports in the format indicated in Schedule 2 Appendix 6 Winter Service Attachment 6.1 Appendices for Winter Service Plan, Table 6.1.1 Winter Service Patrol Report Record.

Routes have been designed to comply as follows:

Cat A patrols shall operate from 02:00 – 10:00 at two hourly intervals as per Schedule 2 Section 6.2.25. Between patrols, vehicles will park up at designated locations on their routes.

The route for the Cat A Patrols are designed so that the patrol vehicle, when working, is able to attend any location on its route within 30 minutes of a call from the WSDO/ILO. The "A" patrols alternate between a one-hour patrol and a one-hour standby on each route.

Cat B patrols shall operate from 00:00 to 09:00 at three hourly intervals i.e. 00:00 – 03:00, 03:00 – 06:00 & 06:00 – 09:00 as per Schedule 2 Section 6.2.26.

The winter service patrol routes shall be covered in the same direction in each period as per Schedule 2 Section 6.2.25.

The patrol vehicle will be fully loaded at the commencement of the winter service patrol as per Schedule 2 Section 6.2.23.

Patrols times may be amended from the above times should the weather forecast predict any snow accumulations on the route.

The winter service patrols will operate out with the specified times when forecasts indicate a high risk of severe conditions due to snow or ice. The vehicles will be used for snow clearance duties on any part of the trunk road network out with the normal patrol times. During the normal patrol times their snow clearance duties will be restricted to their patrol routes. The operational shift pattern used allows these patrols to be operated continuously 24 hours per day.

Patrol routes are detailed in Appendix WSP3

For season 2024/25 BEAR have proposed some changes to TS with regards to Category A and B patrol routes to lessen their carbon footprint, details in Appendix WSP 27

4.2.2 Proposals for precautionary and additional de-icing treatments when low confidence forecasts shall be issued for variable road and weather conditions

Precautionary treatments will be provisionally identified on an action plan prepared each day by 1300hrs following receipt of an expert weather forecast relayed through the ice prediction system. Treatments will be in accordance with the treatment matrices detailed in Attachment 6.1 Table 6.11.2 Treatment Matrix Spread Rates for Precautionary Treatments when road surface temperatures are forecast to fall to less than or equal to 1^{o}C and/or when snow conditions are forecast as per Schedule 2 Section 6.3.5. Thereafter, and in particular, where forecasts are of low confidence, conditions will continue to be monitored by the WSDO; and where conditions require further precautionary treatments, these will be ordered whether part of the action plan or not. Where reserve vehicles are to be deployed to vulnerable locations this will be included as a plough and treat as necessary within the daily action plan and locations identified in the text of the daily action plan email.

For season 2024/25 BEAR have proposed that the 10% salt reduction trial undertaken in the latter part of season 2023/24 be continued for the full 2024/25 winter season, further details in Appendix WSP 27.

4.2.3 Proposals for monitoring the effectiveness of de-icing materials

Winter Duty staff will use a variety of methods to assist with assessing the effectiveness of the de-icing materials which have been spread on the carriageway. These methods include:

- Weather stations detail residual salt and give alarms to indicate low residual salt under certain conditions, however, it should be remembered that particularly in drying out conditions such readings may be unreliable
- Warnings and alarms from weather stations
- Experience of local areas and previous actions
- Feedback from drivers & road condition sensors
- Footage from forward facing dash-cams on winter patrol vehicles, available to Duty staff and Traffic Scotland staff on a web-based application
- Advice from weather forecasters, particularly on likely precipitation (use of weather radar) which may cause salt to be washed from carriageway
- Feedback from external parties such as Police Scotland

The above will be used by the duty staff to make an informed decision as to the status of residual salt on the carriageway, and whether further treatment is required.

4.2.4 Road closure snow gate operational procedures

See 9.1.2

4.2.5 Proposals for dealing with Vulnerable Locations

See Item 3 Arrangements and Mitigation Measures for Dealing with Vulnerable Locations and Appendix WSP12 Arrangements and Mitigation Measures for Vulnerable Locations.

4.2.6 Proposals for Using Alternative De-icers in Extreme Temperatures

As per published guidance UK Roads Board Treatment for Extreme Cold and TRL Guidance on use in Scotland of Five Alternative De-Icers to Salt Suitable for use in Lower Temperatures

When Road Surface Temperatures are forecast to be less than MS 7 ºC consultation with the Director shall be held with a view to potentially utilising alternative de-icers which are more effective at such temperatures.

Alternative de-icers can be used (neat) as a de-icer and added to brine to make the brine/salt mixture more effective at low temperature. The alternative de-icer causes an exothermic reaction bringing the temperature of ice up to MS 5°C where salt starts to be reactive.

Method 1 - Precautionary Treatment with alternative de-icer
Consideration should be given when road surface temperatures are forecast to be below MS 7 ^{o}C to consider substituting the brine with a blend of brine and alternative de-icer in certain climatic conditions.

- Safecote should be used as a straight replacement for brine.
- Magnesium Chloride should be blended with the brine in a 15% magnesium chloride to 85% brine mixture. This equates to approximately 300 litres of magnesium chloride per treatment
- Potassium acetate (PA) is used specifically on bridge decks and is sprayed on the dedicated PA routes by a tanker/sprayer, combi-spreader patrol vehicles can also spray PA as well as spreading salt/brine mix. Refer to specific route treatment cards.

Method 2 – Used neat on hard packed ice from a spray tanker or combi-spreader
Alternative de-icers such as Safecoat and Magnesium Chloride, etc can be used as spot treatments in the event of hard packed ice. Both will operate in extremely low temperatures where traditional Rock Salt is ineffective.

Once the Safecoat and/or Magnesium Chloride is applied to the surface of the ice a further application of salt may be required. A period of time may be required between each application as this helps to break down the hard-packed ice. If the ice is particularly thick and conventional ploughing is not successful then the Raiko Icebreaker or a hard-edged plough could be used. Two of the tractors used by BEAR Scotland will be capable of operating an icebreaker.

Item 5 – Liaison and Communication

5.1.1 BEAR Scotland shall consult with operational partners in the preparation of the Winter Service Plan and discuss winter service provision at the regular liaison meetings held with the adjacent local authorities and Operating Companies to ensure that there are no issues at boundary interfaces. We will also undertake liaison meetings with Police Scotland prior to the start of the winter season to apprise them of the details of the Winter Service Plan.

We will use a variety of social media forums to proactively inform the travelling public of the winter service we will provide. For example, Xmessages will advise the public of the daily forecast, the action to be taken and when it will be carried out.

Our plans for liaison and communication are as follows:

(i) The Director

At the completion of each winter season, BEAR Scotland will prepare an Annual Report in accordance with Schedule 2 Section 6.1.19. This report will be submitted to the Director prior to 31 May; and within 15 working days, an annual review meeting will be held to discuss the contents of the report and performance of BEAR for the winter season just ended. Comments will be taken on board by BEAR in the preparation of the Winter Service Plan (WSP) for the forthcoming season and amendments to the previous WSP made prior to submission by 31 July. Completed current certificates of consultation (Certificate #25SE) with key Stakeholders will be uploaded to the BEARnet and are included in Appendix WSP30. However, Transport Scotland has confirmed that minutes of meetings will suffice and certificates are not required.

Daily, the BEAR Scotland daily winter action plan will be uploaded to Vaisala Manager which Transport Scotland and PAG have access to view.

During periods of prolonged severe weather, BEAR Scotland will update the Director at one hour intervals of conditions on the Trunk Road network or at intervals instructed by the Director. This will generally be done via a conference call or the Multi Agency Response Team (MART). If a road is closed due to severe weather conditions, the Director will be immediately informed by a phone call or text message and confirmed in writing via email within 12 hours of the closure.

Situation reports will be issued hourly to provide updates and/or information on anticipated reopening times to Transport Scotland and Traffic Scotland.

(ii) Police Scotland

For compiling the annual Winter Service Plan, proposed amendments will be discussed with Police Scotland prior to submitting the WSP to the Director for his approval. The discussion shall take the form of reviewing the draft WSP for the forthcoming season. Police Scotland will comment on any problem areas which they think may be improved upon.

During the winter season, it is essential that good communication lines are kept between BEAR and Police Scotland. This is particularly the case during periods of severe weather. A dedicated phone line will be set up for the emergency services and should only be known to them, thus enabling Winter Service Duty Officers to clearly identify emergency calls from any emergency service including Police Scotland.

BEAR Scotland will also liaise closely with Police Scotland during severe weather to ensure that a consistent message is given to media and road users as to road conditions at any moment.

(iii) The Traffic Scotland Operator and Infrastructure Services Contractor

During periods of severe weather BEAR Scotland will liaise closely with Police Scotland and Traffic Scotland so that consistent and accurate messages can be displayed on the variable message signs and on the Traffic Scotland web site.

BEAR Scotland's Daily Action Plan shall be submitted to the Traffic Scotland Operator on a daily basis by no later than 15:00 hours.

Situation reports are completed for any incidents on the network resulting in a lane or carriageway is closed. When periods of severe weather are forecast by the Met Office network condition reports will be provided by Multi Agency Response Team staff or Network Hub staff at the frequency requested by Transport Scotland as per Schedule 2 Section 6.2.15. Push to Talk radio communication is used by BEAR Scotland MART staff to get site information from drivers.

(iv) Adjacent Road and Highway Authorities

Adjacent road authorities, highway authorities, adjacent Trunk Road Operating Companies and DBFOs will be issued with an electronic copy of the WSP.

BEAR Scotland will issue daily to all adjacent road authorities its daily winter action plan and receive the same in return.

Winter issues shall also be an item on the agenda at liaison meetings with all adjacent roads and highway authorities.

(v) Network Rail

There are no railway crossings on the South East Unit, however on a daily basis, the BEAR Scotland daily winter action plan will be submitted to Network Rail.

(vi) Other Operational Partners

BEAR Scotland will interact with other Operational Partners as required.

Item 6 – Mutual Aid Arrangements

6.1 Mutual Aid

6.1.1 BEAR Scotland will liaise closely with already well-established winter maintenance contacts within all local authorities to co-ordinate resources including labour, plant and salt to assist any party requiring mutual aid.

Management of mutual aid shall be agreed and co-ordinated at a senior management level and shall be recorded in full detail. Mutual aid could take the form of supplying materials, plant or labour.

Any agreement to free resources for mutual aid shall be agreed with Transport Scotland in advance, taking into consideration:

- current weather hazards on the Trunk Road network
- weather forecast
- prioritisation of need

DBFO/Local Authority Contacts:

- M8 DBFO (Amey) – xx xx
- NE Unit (Amey) – xx xx
- NW Unit (BEAR Scotland) - xx xx
- SW Unit (Amey) – xx xx
- M80 DBFO (BEAR Scotland) – xx xx
- M6 DBFO (Autolink) – xx xx
- Edinburgh City Council – xx xx
- Midlothian Council – xx xx
- East Lothian Council – xx xx
- West Lothian Council – xx xx
- Falkirk Council – xx xx
- North Lanarkshire Council – xx xx
- South Lanarkshire Council – xx xx

- Stirling Council – xx xx
- Dumfries and Galloway Council – xx xx
- Clackmannanshire Council – xx xx
- Fife Council – xx xx
- Police Scotland Trunk Road Policing – xx xx
- Northumberland CC – xx xx

If requested Mutual Aid will be provided to Harthill Services, Edinburgh Airport, the Refinery at Grangemouth, Northumberland Council, M80 DBFO, M6 DBFO and any other agencies at request.

Welfare kits as per Schedule 2 Section 6.2.9 – winter service vehicles will carry welfare kits for distribution in the event of a Critical Incident that involves stranded vehicles comprising of the following:

- 24 emergency blankets
- 24 bottles of water
- 24 energy bars

BEAR Scotland will support the Director in the operation of the Scottish Salt Group as per Schedule 2 Section 6.1.17.

Item 7 – Winter Service Patrols

7.1 Winter Service Plant and Reporting

From 1 November to 30 April inclusive Winter Service Patrols shall be carried out on all routes in the South East network as shown in Appendix WSP3 (Table 6.1.2 Patrol Routes). Appendix WSP3 also contains a map of the Winter Patrol Routes for the South East Unit.

7.1.1 The plant designated to carry out these patrols is detailed in Appendix WSP15 (Table 6.1.6).

7.1.2 Each patrol route driver shall update their patrol record sheet as detailed in Appendix WSP16 Patrol Record during their patrol and submit the final record on completion of their shift which will include any treatments they have carried out. In the event of deteriorating conditions they will advise the WSDO.

Item 8 – Treatment Routes

8.1.1 Precautionary Treatment Routes

(i) Route cards for carriageway precautionary treatment routes are detailed in Appendix WSP1 Precautionary Treatment Routes to Table 6.1.2 20 g/m^2 Routes and to Table 6.1.2 40 g/m2 Routes. The plant designated to carry out these treatment routes is detailed in Appendix WSP15 (Table 6.1.7). Automated spreading will be used on precautionary treatment routes, The system is provided by our telematics provider Locatu.

All routes have been designed to ensure that treatment time will be completed within 2 hours of commencement. Furthermore, each route has been assessed to ensure that the 1 hour contractual response time in Schedule 2 Section 6.3.18 will be met.

During precautionary treatments, all Winter Service Plant shall be driven in a manner appropriate to the prevailing weather conditions. The maximum speed limit for salting is 40 mph as per Clause 6.3.6.

Dry runs will be carried out prior to the 1 October each year.

Records of preparation training will be retained.

A basic map of each proposed route has been provided in WSP1 (Table 6.1.2 20 g/m^2 Routes and 40 g/m^2 Routes). More detailed electronic maps of each route are provided in the SE Records Referencing System in BEARnet and can be accessed in the links provided in Appendix WSP28.

The total width of carriageway areas shall receive precautionary treatments as per Schedule 2 Section 6.3.4 including;

- Slip Roads;
- Hardshoulders;
- Hardstrips;
- Turning lanes;
- Central reservation crossover;
- Contiguous laybys;
- Bus bays;
- Car parks;
- Cycle lanes;
- Hatched areas.

Treatment of 2+1 sections and junctions and areas deemed to be contiguous will be undertaken in accordance with Schedule 2 Section 6.3 Treatments with the spread pattern adjusted to suit the carriageway layout. Areas of more than three lanes will be treated in two passes as per the Route Cards.

Non-contiguous laybys shall not receive precautionary treatment. However, where ice is present and following snowfall the non-contiguous laybys shall be cleared once the carriageway is cleared of snow.

Route	Location
A9000	Forth Road Bridge
M90	Queensferry Crossing
A985	Kincardine Bridge
A876	Clackmannanshire Bridge

Figure 6: Potassium Acetate Treatment Locations

Potassium acetate treatment shall be applied at the locations specified in Figure 6 above including those parts of the Trunk Road 400 metres beyond the limits of each of the Forth Road Bridge and the Queensferry Crossing and 200 metres beyond the limits of each other bridge.

Footways/cycleways on the above bridges will also be treated with potassium acetate.

Precautionary treatment using potassium acetate will be spread at a rate as determined in Appendix WSP18 Decision Matrix for Winter Service.

For season 2024/25 BEAR have proposed that on ALL dry/damp roads the potassium acetate treatment for major bridges should be 15.6ml/m2 not 31.2 ml/m2 as specified in Appendix WSP18, further details in Appendix WSP 27

(ii) Should for whatever reason the normal access to a route be blocked, this route will be accessed from an alternative depot as per Route Cards.

(iii) Precautionary treatment routes will initially be operated from Rosyth, Burghmuir, Lochgelly, Bonnyrigg, Chryston, Eyemouth and Charlesfield depots. Table 6.1.5 in Appendix 21 provides operational de-icing material stock levels.

(iv) There are presently no designated cycling facilities within urban areas contained within the network area. Any cycleways that are designated as Category A are detailed in Appendix WSP2.

(v) Particular care to be taken when precautionary treatments are being undertaken to ensure that all running lanes within TTM are treated in line with the Daily Action Plan and similarly that any closed sections within TTM are treated prior to being re-opened to traffic.

Category A footways shall receive precautionary brine treatment when the temperature is forecast to be below 1°C after 0600 hours each morning. Where conditions are dry and the forecast indicates that the minimum RST will remain above +0.5°C or if the RST recovers above +0.5°C prior to 0600hrs the WSDO will discuss whether or not a treatment is required with the SWM. All other footways are Category B and treatments will be undertaken as instructed by the Director. The brine tank on the footway spraying equipment will be supplemented by additional brine storage carried on the towing vehicle.

Treatment to all Category A footways, footpaths and cycle facilities will be undertaken in accordance Schedule 2 Section 6.3.13 and Table 6.10.3 of Schedule 2 Appendix 6 Section 6.10 as detailed in Appendix WSP2 Footway Treatment Routes and Maps and completed by 0600 hours each morning as per Schedule 2 Appendix 6 Table 6.10.1.

Category A precautionary treatments for footways, footpaths and cycle facilities shall be treated with brine at 20 ml/m^2.

For season 2024/25 BEAR have proposed that the Footway Treatment trial undertaken in the latter part of season 2023/24 be continued for the full 2024/25 winter season, further details in Appendix WSP 27.

If there are problems with the brine production systems at the depots or brine distribution systems on any vehicle which cannot be rectified in reasonable time dry salt will be used to ensure routes

are treated in line with the NMC requirements. Should this need arise permission to use dry salt will be sought from TS as required by Sch 2 Cl 6.3.14.

COVID-19 Treatment Routes have been developed in case of a significant driver shortage. A table of routes in available in Appendix WSP29.

8.1.2 As 8.1 (iv) above

Item 9 - Snow and Ice Clearance

9.1 Snow Clearing

Using the 2-5 Day Forecast the WSDO and SWM will consider the need for additional labour and plant to be mobilised to deal with snow.

In advance of an accumulating snow forecast precautionary treatments will be at 40 g/m^2. During snow clearance using ploughs salt will be spread at 40 g/m^2. When the forecaster predicts snow accumulations in a vulnerable location that includes a gradient of 0.2 cm/hr or greater the Operating Company shall mobilise frontline and reserve winter service plant on to routes in advance of snow fall as per Schedule 2 Section 6.2.31 no later than one hour before forecast snowfall. This change is in line with the requirements of the North Area NMC's and our proposal is to mirror these contracts. If this is acceptable we will submit a formal change of contract proposal.

To comply with Schedule 2 Section 6.3.25 snow plough blades have ceramic inserts. This allows the plough blades to be in full contact with the carriageway surface ensuring full removal of snow. To prevent damage to the carriageway or the plough blades, the ploughs will be operated on a hydraulic float mechanism.

During previous season's a trial was undertaken where the ploughs could be removed from the vehicles when there were no snow accumulations in the 2-5 day forecast. Cumulatively for all vehicles over a period of time this resulted in significant carbon savings. A contract change was issued for this during last winter season.

9.1.1 Arrangements for Managing Snowfall

Ploughing routes are based on the 40 g/m^2 treatment routes Appendix WSP1 (Table 6.1.3) focussing on keeping at least one lane open. When applicable the clearance procedure for dual carriageways and motorways will be echelon ploughing. There are ploughing techniques detailed for general road surfaces, the Queensferry Crossing and the Forth Road Bridge. See WSP22 Snow and Ice Clearance Procedures.

Additional Winter Service Plant is available to be deployed for moderate or heavy snow and snow showers as defined by the UK Met office. It can be utilised to supplement reserve Winter Plant at Vulnerable Locations or for any other winter weather conditions that cannot be managed by Front Line or reserve Winter Plant.

When there is a Unit-wide forecast of 5 cm or more of snowfall all available frontline, patrol, reserve and additional winter service plant will be deployed. Where the forecast only affects part of the network appropriate resources will be deployed. See WSP20

Our Daily Forecast also details routes with the potential for Drifting Snow, during the forecasting period. Our forecaster provides detailed updates as required. We may also seek the advice of our weather forecaster out with these update periods as to the severity and nature of the drifting snow.

Treatment and pre-deployment of resources for snow clearing will be based around the advice from our expert weather forecaster.

When instructed by the Director the Operating Company/DBFO Snow Plan will be implemented including:

- M6 DBFO heavy recovery vehicle;
- M80 DBFO 1 spreader to treat and plough, Fastrac patrol;
- M8 – Fastracs, extension of existing routes and patrols, heavy recovery vehicle

The Snow Plan can be found using this link - *https://www.transport.gov.scot/our-approach/keep-scotland-moving/winter-service/#42965*

Details of snow blowers, loading shovels, de-icing vehicles fitted with plough blades and other winter service plant provided directly by BEAR Scotland and through supply chain arrangements can be found in Appendix WSP15.

Where hard packed snow and ice not exceeding 20mm thick has formed, and the air temperature is above minus 5°C, removal will be achieved by successive spreading of de-icing material. Below minus 5°C or where the snow or ice is more than 20mm thick great care will be taken as the use of de-icing material alone can result in an uneven and slippery surface. A single sized abrasive aggregate of particle size of 6mm, or 5mm sharp sand and having low fines content will be added to the de-icing material on a 1:1 ratio. Reversion to the use of de-icing material only will be made as soon as possible. Abrasive aggregates will be considered as a supplement in urban areas where de-icing material alone would provide an unacceptably slippery surface.

During prolonged periods of snowfall at locations where the use of salt for de-icing is prohibited such as bridge decks, ploughing will be continuous followed by applications of Potassium Acetate as required. If snow becomes hard packed consideration will be given to applying 5mm sharp sand to aid traction while snow clearing operations are being carried out.
In extreme conditions, such as when temperatures drop below levels at which sodium chloride is ineffective, the Operating Company will use alternative de-icing materials (e.g. Magnesium Chloride). See 4.2.5 above.

Should hard packed snow or ice be present consideration will be given to deploying additional measures such as using a Raiko ice breaker and/or using the alternative de-icing agent Magnesium Chloride.

During snow clearing operations all Winter Service Plant shall be driven in a manner appropriate to the prevailing weather conditions.

Appendix WSP18 Decision Matrix for Winter Service provides Contractual target timescales for snow clearance.

9.1.2 Road Closure Procedure Including the Use of Snow Gates

Any decision to close a road will normally be taken by Police Scotland. Only one section of road within the South East Unit has snow gates which is A68 at Soutra.

The WSDO, the Director and Traffic Scotland will be informed immediately by telephone, and in writing within 12 hours, of any decision to close a road, or of other major problems encountered within the Unit due to winter weather conditions. Updates on progress and likely duration of any road closures will be provided at 1 hour intervals to to the TSOIC via Situation Report's/ MART

Police Scotland will normally notify the other Emergency Services of road closures and the WSDO/ILO will notify the local Roads Authorities of any relevant trunk road closures.

The WSDO/ILO will liaise with and co-operate with Police Scotland to control the snow gates, if applicable, until a search of the road between the gates has been undertaken to ensure that no vehicles or pedestrians are trapped.

Once it has been ascertained that no-one has been trapped between the snow gates, the gates will be secured and all BEAR Scotland personnel withdrawn except those involved in the clearance of snow.

When it is considered safe, Police Scotland will request BEAR Scotland assistance to open the gates. The WSDO/ILO shall immediately inform Traffic Scotland and the Director of the reopening of the road. A written report will be submitted to the Director within 12 hours (or if outside of normal working hours then the morning of the next working day) of Police Scotland instructing the road closure.

Padlocks for each gate will be operated by number code with details held at the Network Hub and provided to Police Scotland.

In certain situations (e.g. Amber/Red Met Office snowfall warnings) and following discussions with Police Scotland it may be necessary to have plans in place to restrict access to parts of the network. In order to achieve this pre-deployment of signs and cones to specific locations would be necessary based on the level of warning and forecast.

In exceptionally severe conditions, such as blizzards, resulting in reduced visibility and deep drifting snow the SWM may decide that it is unsafe for operational staff to continue to clear snow or ice and operations may have to be suspended until conditions improve. Such occurrences are likely to be extremely rare and the SWM would consult with the Police, the Director, the expert forecaster and Traffic Scotland prior to making such a decision.

9.1.3 Prolonged Snowfall Strategy

During prolonged periods of snowfall, ploughing will be continuous to prevent a build-up of snow and compaction by traffic until the road is clear and snow fall has stopped. Reserve and additional winter service plant will be used to supplement frontline winter service plant in snow conditions, when required.

When planning and carrying out snow clearance, BEAR Scotland will pay attention to the layout of the carriageway in terms of the overall number of lanes and the location of entrance and exit slip lanes. Snow clearance of slip roads will be co-ordinated with main carriageway clearance, and a clear path kept open between those entry and exit points where frequent lane changes are necessary.

Clearance of snow from contiguous and remote laybys will be carried out once the main carriageway, junction areas and crossovers have been cleared of snow.

At roadworks, traffic management equipment must not be disrupted. An accumulation of ploughed snow creating a ramp adjacent to safety fences and concrete barriers will be avoided.

Where snow ploughing is not possible, for example:

- in exceptional circumstances when the snow on the road is deep and cannot be removed by conventional ploughing
- when de-icing treatment over packed snow is likely to provide an unacceptable surface,
- when the traffic is insufficient to disperse the snow

BEAR Scotland will lift, remove and dispose of snow and ice and/or utilise snow blowers, with the snow being directed onto adjacent land (where BEAR Scotland has obtained the prior agreement of the landowner and the Scottish Environmental Protection Agency). Such operations will be followed by de-icing treatment. Snowblowers will comply with the requirements of Schedule 2 Section 6.5.14 and Section 6.5.15.

When snowploughing or snow blowing operations are undertaken care will be taken that snow does not build up across:

- railway tracks or against gates
- bridges
- parapets
- fences and safety fences
- walls and other boundaries

Speeds of ploughing vehicles will be regulated, particularly at features such as underbridges where snow could be thrown over the bridge parapet, and adjacent to the central reserve where snow could be pushed into the opposing carriageway. When ploughing snow, other vehicles will not be overtaken unless stationary.

9.1.4 De-icing and spread rates for snow and ice clearance of carriageways are detailed in Appendix WSP18 Decision Matrix for Winter Service

9.1.5 When ploughing wide single carriageway roads to remove snow accumulations from the two-lane section of three lane sections of road, the priority will be to keep lane 2 open to traffic, and the procedure will be to plough snow from lane 2 into lane 1 initially. Once lane 2 is free of snow, all resources will concentrate on lane 1, ploughing snow towards the carriageway channel. This particularly applies to WS 2+1 roads and roads with crawler lanes.

9.1.6 Resources shall be deployed to ensure that footways, footbridges & cycle facilities are cleared of snow and ice in accordance with Schedule 2 Appendix 6 Table 6.10.2. Snow Clearance Operations on Category A Footways as detailed in Schedule 2 Appendix 6 Table 6.10.3 will be undertaken between 0600 hours and 1900 hours. Footways should be cleared of snow within 2 hours of snowfall ceasing. Footway tractors will have data loggers to record material spread rates and locations. Any areas spread from a backpack will be detailed in a daily work record. All Forth Road Bridge service roads, footways, footpaths and cycle facilities which require precautionary treatments and snow clearance are detailed in Route Cards.

9.2 Maps showing details of the footways, footbridges and cycle facilities are detailed in Appendix WSP2 Footway Routes

During snowfall additional resources will supplement precautionary treatment routes resources to meet Contractual requirements in accordance with Schedule 2 Appendix 6.10.3. Where necessary supply chain partners will be deployed. These resources will utilise small tractors with ploughs, small footway snow blowers, walk behind pedestrian ploughs and mini excavators.

Where necessary when mechanical means cannot be used snow clearance and salting will be undertaken by hand
We will encourage community self-help during winter conditions through engagement with local community councils for Category B footways. Where there is a willingness to get involved, we will propose providing them with self-help kits of backpack brine sprayers, intermediate bulk containers of brine, hand-push salt spreaders, salt stocks, snow shovels and personal protective clothing. Training and induction in safe working methods will be provided to all volunteers.

Item 10 – Freezing Rain/Rain Falling on Extremely Cold Surfaces

10.1 Advance Planning

The prediction of freezing rain is difficult and the action necessary to deal with it is problematic. The very nature of freezing rain means that treatments will have virtually no effect initially and ice will form on the carriageway. Considering the limits in the effectiveness of treatments in dealing with freezing rain it is essential that practical measures are implemented to provide warning to road users of the hazardous conditions. Measures for dealing with Freezing Rain fall into three main areas: Advance Planning, Operational Arrangements and Hazard Mitigation.

These measures are considered in further detail as follows:

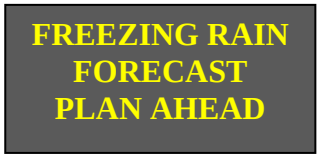
10.1.1 Advance Planning for Freezing Rain / Rain Falling on Extremely Cold Surfaces

(i) Advance planning includes consideration of the potential impact of freezing rain and development of contingency arrangements to mitigate the effects. These contingency arrangements are documented below.

- If freezing rain occurs during a forecasted period of severe weather that necessitates a Yellow or Amber Met Office Severe Weather Warning the MART may be activated.

- Any Police Scotland response to freezing rain would be part of a multi-agency operation and would be subject to other ongoing operational commitments.

- Advance signing of the forecast of freezing rain may be signed on the Traffic Scotland national network of VMS, with an appropriate legend such as:



- The use of social media platforms, at a strategic level, can also be used to provide

advanced warning of the forecast conditions and what the general public should expect should such weather conditions prevail.

Specific measures which BEAR will take are as follows:

- Outline operational arrangements for carrying out Precautionary Treatments are documented within this WSP under Appendix WSP1. 40g/m^2 Precautionary Treatment Routes will be utilized.

- Although the adverse effects of freezing rain can impact across any part of the network, particular consideration will be given to those parts identified as Vulnerable Locations in Appendix WSP12

- On receipt of a forecast of freezing rain or rain falling on extremely cold surfaces, a conference call will be initiated with the Director (Transport Scotland), Traffic Scotland, Police Scotland and appropriate Local Authorities and service providers in the affected area.

Topics for discussion should include:

- Forecast and expected timings
- Extent of routes affected
- BEAR Scotland Plant & Police Scotland Resources
- Police travel / no travel advice
- Advance VMS warnings
- Social Media / Media Release

(ii) Risk Assessments

Freezing rain will require to be treated in a similar manner to snow. Refer to risk assessment and method statements for snow clearance available in BEARnet.

10.2.1 Operational Arrangements

(i) As above freezing rain will have to be treated in a similar manner to snow i.e. treatment in advance of, during the event and then treatment following as required.

Freezing rain usually occurs along the line of an incoming warm front. To ensure maximum effectiveness of the salt, the advance treatment should be made in the same direction and immediately in advance of the weather front. The weather radar, provided by MetDesk, will be used by the WSDO to determine the timing of the treatment and where practicable, the direction of treatment.

Consideration will be given to stationing vehicles at the point on the route where the weather front will first hit in order that timely treatments can be undertaken.

(ii) Salt will inevitably be lost during and following treatment, therefore constant monitoring will be required. Successive treatments will be required during rainfall and continued until such time that the rain has ceased, or the temperature of the road has risen above freezing.

It is likely the first confirmed instances of freezing rain will either be from the winter drivers patrolling during the event, from members of the public or Police Scotland.

10.3.1 Hazard Mitigation

(i) The very nature of freezing rain means that treatments will have virtually no effect initially and ice will form on the carriageway. Mitigation of the hazard is therefore a significant aspect of the actions taken in response to freezing rain or rain falling on extremely cold surfaces.

The main action is to inform road users of the hazard, however more pro-active measures may be required.

The national network of VMS operated by Traffic Scotland should be used to warn road users of the hazard.

TRISS units may be deployed to provide localised warnings utilising the vehicle mounted VMS.

(ii) Consideration should be given to closing the road as the rain arrives and holding traffic (rather than diverting) until such times as it is deemed safe to proceed.

Consideration could be given to the use of rolling blocks and convoy arrangements to either hold or slow traffic down both just prior to and during the event. Again, this will require resources from Police Scotland as only they have the legal authority to control traffic in this manner and would be subject to ongoing operational commitments.

In addition to the arrangements made in respect of advance planning, operational procedures and hazard mitigation, it will be necessary to consider the arrangements to be implemented should incidents occur as a result of the freezing rain.

These should follow existing procedures set out in the Disruption Risk Management Plan for the management of Major and Critical Incidents.

Item 11 - De-icing Materials

11.1 Details

De-icing materials will primarily comprise rock salt and potassium acetate. In extreme conditions, such as when temperatures drop below levels at which rock salt is effective, BEAR Scotland will consider the use of alternative de-icing materials such as magnesium chloride. See 4.2.6 above.

11.1.1 (i) Specification

Potassium acetate used for de-icing operations will comply with the AMS 1435D: Liquid Runway De-icing/Anti-icing Product .

Salt for de-icing will be 6.3mm grading particle size complying with BS3247 and treated with an anti-caking agent. Marine salt for brine production will also comply BS3247. No arisings are

anticipated from this marine salt but should arisings exist they will be treated as waste and not added to the stock pile.

For pre-wetting salt, the percentage of salt brine added to salt for spreading Operations will be 30% of the total weight of spread material, and the saturated salt in the brine solution before combination will be 23%.

Brine will be produced and stored in purpose-built salt saturators sited at Rosyth, Burghmuir, Lochgelly, Bonnyrigg, Chryston, Eyemouth and Charlesfield depots. These saturators will automatically produce and store brine of the correct concentration and transfer it to saddle tanks located on the spreaders by means of an integrated pump. Digital read outs are fitted to brine production facilities, with remote access to those read outs and an alarm for notification of loss of production or out of specification production. A text message is sent to nominated persons in the event of any brine production problems arising. The system shuts down production until corrective action is undertaken to ensure brine is only produced at the correct percentage. Remote access will be arranged for the Director and PAG, where requested. In addition, daily checking of brine concentration in the saturators will be carried out by Depot Supervisors by means of a refractometer, and records held at the depot. The saturators will be serviced on an annual basis through a service contract with the manufacturer. The water pipes to the saturators will be frost protected to ensure they can operate in extreme temperatures.

Brine production units have the capability of fully replenishing themselves within 2 hours of being depleted in accordance with Schedule 2 Clause 6.4.15.

Rainwater harvesting systems have been fitted at Burghmuir and Bonnyrigg Depots due to previous problems with the mains water pressure. The system will also be mains connected and of sufficient size to ensure that all demand is met.

Where air temperatures are forecast to fall below MINUS 15^{o} Celsius the brine will be diluted by an additional 5 to 10% of water to prevent recrystallisation. Ensuring that that the solution is well mixed.

Typical analysis from our salt suppliers are shown in Figures 7 and 8.

Chemical Analysis	BS3247	SSC typical
	Percent	percent
Total Chlorides expressed as NaCl	90.0 minimum	91.0
Insolubles	7.0 maximum	6.5
$CaSO_4$	2.5 maximum	2.5
H_2O	4.0 maximum	

Particle size distribution	BS3247	SSC typical
Mesh size (mm)	% retained	% retained
+6.30	0	0
+5.60		0
+2.36	20 – 70	30
+1.18		0

+0.30	80 minimum	87
Reagent Addition	Typical (ppm)	
Anti-caking agent	80ppm	

Figure 7: Typical Specification for Dry Salt Supplied by ICL (Cleveland Potash)

Chemical Analysis	BS3247	PS typical
	Percent	percent
Total Chlorides expressed as NaCl	90.0 minimum	98.5
Insolubles	7.0 maximum	0.5
$CaSO_4$	2.5 maximum	1.0
H_2O	4.0 maximum	1.0

Particle size distribution	BS3247	PS typical
Mesh size (mm)	% retained	% retained
+6.30	0	0
+5.60		1
+2.36	20 – 70	35
+1.18		63
+0.30	80 minimum	90
Reagent Addition	Typical (ppm)	
Anti-caking agent	30ppm	

Figure 8: Typical Specification for Brining Salt Supplied by Peacock Salt

(ii) Storage

BEAR Scotland will undertake environmental risk assessments of all depots to identify measures necessary to ensure that SEPA guidelines and requirements are adhered to. Materials will be stored within a covered structure or within bulk containers and in accordance with current planning, environmental regulations and as per Schedule 2 Appendix 6 Section 6.13.1 'Specification for Salt Storage Facility'.

As de-icing salt is removed from storage areas, a positive slope will be maintained to avoid danger to operatives and winter service plant from the collapse of stockpile cliff walls. BEAR Scotland will ensure that de-icing material stockpiles are managed and safeguarded effectively and those stockpiles do not become contaminated with foreign matter likely to cause damage to winter service plant and affect other trunk road users, by storing all salt on either a concrete or bituminous base.

(iii) Testing Methods

Salt shall be tested in accordance with BEAR Scotland Procedure 093 – Winter service salt testing (Appendix WSP31), to ensure that the salt complies with BS3247.

To ensure that BEAR Scotland does not receive salt which does not comply with BS3247, all our salt suppliers will be ISO9001 accredited. Should a supplier deliver de-icing salt which is non-compliant, the following procedure will be implemented:

- The supplier will be notified as soon as possible
- The severity and type of failure will be analysed
- If the failure can be rectified (i.e. moisture content) then a solution will be sought with the supplier
- If the failure cannot be corrected, arrangements will be made with the supplier to deliver further supplies of de-icing salt and remove the supplies which failed.

Salt stored in depots found, through monthly testing, to be non-compliant with BS3247, will be quarantined in a separate stockpile and will not be used for treating the Unit.

(iv) Suppliers

BEAR Scotland has developed arrangements with national de-icing material suppliers:

- Cleveland Potash Ltd. Boulby Mine, Loftus, Saltburn-by-the-Sea Cleveland, TS13 4UZ
- Peacock Salt, Jura Terminal, North Harbour, Ayr, KA8 8AE
- Safecote Ltd, Winnington Hall, Northwich, Cheshire, CW8 4DU
- LNT Solutions, Helios 47, Leeds LS25 2DY
- TR Bonneyman, Willowyard I.E. Beith KA15 1LN

(v) Importers

All suppliers are currently within the United Kingdom.

(vi) Stock Levels

A table of salt stock levels is included in Appendix WSP21 De-icing Materials - stock levels for all de-icing material by depot.

During the winter period, salt stock monitoring reports will be made to the Director using the salt reporting system portal at https://cms.traffic-scotland.co.uk/ as per Schedule 2 Section 6.1.18 (a) and (b). An explanation of how the number of resilience days at each depot will be calculated and reported is included in Appendix WSP26 Salt Resilience Days per Depot.

When requested by the Director, daily salt monitoring reports will be provided within 4 hours of receipt of the request.

(vii) Restocking and Monitoring

BEAR Scotland shall provide the minimum operational salt stock levels at the start of the Winter Service Period as per Schedule 2 Appendix 6 and as detailed in Appendix WSP21 De-icing Material Stock. If salt stocks have reduced to 90 percent on 21 December in any Winter Service Period, the Operating Company shall restock to 100 percent of the full pre-season stocks.

Salt stocks will be continuously monitored and managed. During the winter period, a detailed daily return of salt used will be entered into Vaisala RoadDSS Managers Salt Management system by the WSDOs/ILOs and salt deliveries will be entered into the system by the SWM. During snow conditions a daily report of salt usage will be submitted. This continuous monitoring will ensure salt stocks are replenished timeously. Salt stocks will be surveyed 7 days before the start of each winter service period and 5 working days before the 7 December by an independent specialist surveyor. A copy of the survey report including calculations will be provided to the Director no later than one day after receipt.

The procurement of salt will be on a call-off basis and triggered by minimum stock levels at each depot. The SWM is responsible for the ordering of salt.

Alternative de-icing materials (Magnesium Chloride) will be restocked to 50,000 litres when the stock level has fallen to 30,000 litres. Restocking to be within 7 days as per Schedule 6 Clause 6.4.20.

11.1.2 The cumulative minimum salt stock level at the beginning of the season is 25,000 tonnes. Appendix WSP21 De-icing Materials - stock levels for all de-icing material by depot.

Item 12 – Strategic Salt Stocks

As ordered by the Director, BEAR Scotland will procure, transfer and store strategic salt as required.

Item 13 – Winter Service Plant

13.1.1 In accordance with Schedule 2 Appendix 6 Winter Service Attachment 6.1 Appendices for Winter Service Plan:

13.1.2 Winter Service Plant

All winter plant is detailed in Appendix WSP15 as per Schedule 2 Appendix 6 Section 6.5.19

(i) (Table 6.1.6) Patrol Vehicles
(Table 6.1.7) Frontline Vehicles
(Table 6.1.8) Frontline Footway Plant
(Table 6.1.9) Reserve Vehicles - 1 Reserve Vehicle is provided for every 3 Frontline Vehicles as detailed in (Tables 6.1.7 and 6.1.8)

(ii) (Table 6.1.10) Additional Winter Plant

(iii) Loading Winter Service Plant - 5 loading shovels will be permanently available within the Unit, 1 at each of the following depots: Rosyth, Burghmuir, Lochgelly, Bonnyrigg, Chryston, Eyemouth and Charlesfield

An electronic register will be maintained within BEARnet containing details of the operational status of the winter fleet and loading plant. This register will be used to provide daily operational updates as per Schedule 2 Section 6.1.18 (e).

In the event of a breakdown of frontline winter service plant the cause, time and location will be recorded in the Vaisala Manager diary facility within 1 hour of the breakdown occurring. Where practical the vehicle will be returned to the nearest depot and a replacement vehicle mobilised.
During training and maintenance the spinner disc on winter service spreaders should be covered.

The vehicle on-board electronic data loggers are compliant with SCH 5 Cl 2803AR. In the event of a malfunction of the data logger the Operating Company shall prepare a written record within 12 hours of the malfunction occurring.

The contract requires 1 reserve vehicle for every 3 frontline/ patrol vehicles and as such reserves are based at depots in the ratio of 1 for every 3 frontline/ patrol vehicles at that depot, this means that reserves are predominantly based on the motorway/ dual network, away from the majority of the Vulnerable Locations with significant gradients.
We still believe that the use of tractors is a good alternative to reserve vehicles particularly on single c/w routes where the majority of the Vulnerable Locations are as they are smaller and more manoeuvrable than HGV's and can therefore turn at either end of the Vulnerable Location more easily.
Therefore we will utilise tractors as and when required on single c/w routes in lieu of reserve vehicles.

13.2 Calibration of Winter Service Plant

13.2.1 In September and January of each Annual Period, the Operating Company shall calibrate all equipment for spreading de-icing material:

- in accordance with the requirements of BS1622, or
- where BS1622 does not provide for the calibration of any de-icing spreading equipment, in a manner proposed in writing by the Operating Company and consented to in writing by the Director. As a minimum the Operating Company shall provide details of the Winter Service Plant supplier's calibration method to the Director, and
- in accordance with the requirements of the specific material being used
- September testing shall comply with the requirements of tests 'A' and 'B' and January testing shall comply with the requirements of test 'B' of BS1622.
- Re-calibration and testing shall be carried out after repairs to the spreading equipment and at other times when necessary to ensure the accuracy of de-icing material spreading.

13.2.2

- All calibration and re-calibration shall be independently carried out and certified. Calibration certificates shall be held in the Operating Company's Management System.
- Calibration of spreaders will be carried out in accordance with the National Winter Service Research Group document 'Best Practice Guidance for Spreading Salt'.
- All calibrations will be carried out in BEAR Scotland depots. The certification for these independent calibrations will be held in the Central Office, in accordance with our documented Quality Management System. Copies of the calibration certificates will be held in the relevant depot for the vehicle. Calibration Certificates will be available for inspection by the Director and the Performance Audit Group at any time on BEARnet.

Item 14 – Compounds, Depots and Facilities

14.1 A schedule of compounds, depots and facilities covering the network within the South East Unit is included in Appendix WSP17.

Item 15 – Maps, Drawings and Graphical Information

15.1 Maps

(i) Precautionary treatment routes including summary table of routes, route card and route map (20 g/m^2 and 40 g/m^2) – see Appendix WSP1
(ii) Precautionary treatment routes for footways, footbridges and cycleways including summary table of routes, list of all Category A footways, detailed treatment location map – see Appendix WSP2
(iii) Reactive treatment routes for footways, footbridges and cycleways – See (ii) above
(iv) Winter Service Patrols Routes Category A and B – summary table of routes, map of Unit showing all routes - see Appendix WSP3
(v) Ploughing Routes – as per 40g/m^2 routes in (i) above.
(vi) Weather Stations – see Appendix WSP4
(vii) Snow Gates – see Appendix WSP5
(viii) Snow Fences – see Appendix WSP6
(ix) Shelter Belts – not applicable
(x) Snow Poles – not applicable
(xi) Snow and Ice Folding Message Signs – see Appendix WSP7
(xii) Salt Bins – see Appendix WSP8
(xiii) Vertical Concrete Barriers – see Appendix WSP9
(xiv) Other Facilities – not applicable
(xv) Where Route Based Forecasting is not used, Climatic Domains and the Sensors Used to Generate Domain Forecasts – see Appendix WSP10

Item 16 – Compiling and Maintaining Records

Records of decisions, amendments to decisions, actions taken and patrol communications will all be maintained on electronic logs in the Network Hub. It is the responsibility of the WSDO to ensure all winter records (electronic and 'hard' copies) are collated and maintained as per procedure proc-207SE – Control of Winter Service Records (available in BEARnet)

On completion of a precautionary treatment the weight of de-icing material used is input to Vaisala Manager and checked against the route target tonnage spreadsheet (See Appendix WSP23). Should it be below the minimum target tonnage of 90 % of the target route tonnage the WSDO decides what action to take. Any decisions taken will be recorded within Vaisala Manager.
For season 2023/24 we will be trialling a Power App for the vehicle driver to record their Treatment Record, In time we hope to do away with the paper Drivers Record, this should improve efficiency in terms of time and storage of records.

The vehicle data logs will be interrogated for effectiveness and efficiency of the operations. A daily report on the preceding days winter maintenance operations will be submitted to the SWM for

perusal and action where required. In addition, records as detailed in Schedule 2 Appendix 6 will be held in appropriate electronic logs.

The following table identifies typical records required and where they will be held electronically:

Annex 7.2H – Records required	Currently held in
Summary Forecast and Actual Weather data	Vaisala Manager
Decisions taken, when and by whom	Vaisala Manager
Planned and actual treatment Records	Vaisala Manager
Planned and actual response times achieved	Vaisala Manager
Planned and actual commencement times	Vaisala Manager
Planned and actual Route times	Vaisala Manager
Planned and actual spread rates	Vaisala Manager
Observations and actions taken by the Winter Service Patrols	Vaisala Manager / BEAR Call log
Loading point de-icing stocks and replenishment orders	Vaisala Manager
Weight and volumes as appropriate for the amount of de-icing material spread on each Route for each treatment.	Vaisala Manager
Actual salt stocks held including strategic salt stocks	Vaisala Manager
Number of treatment days (capability) of de-icing material available for each depot based on six treatments per route per day at 20 g/m^2	Vaisala Manager
Ice prediction system Records	Vaisala Manager
Output from Winter Service Plant on-board data loggers to Schedule 5 Clause 2803AR, data stored in accordance with Clause 2804AR	Locatu
Plough usage	Locatu
Winter Service Plant down time and software faults	Locatu / BEAR Fleet Defect Reporting
Winter Service Plant Deployment Records (including vehicle location Records) and driver and operator logs	Locatu
Log (both manual and electronic) for telephone, email and two-way communication calls	BEAR CMS log
Complaints by members of the public and Trunk Road users	TRCC & BEAR CMS log
Accidents during winter conditions	BEAR CMS log
Road closures due to weather conditions	BEAR CMS log
Pre- and mid-season road sensor calibration systems	BEARnet
Winter Service Plant Calibration Certificates	BEARnet
Weather Forecast Accuracy	BEARnet
Salt Testing Records	BEARnet
Any other relevant information	BEARnet

Figure 9

A shared area shall be set up on the BEAR Scotland central computer server where appropriate files not stored on Vaisala Manager and Locatu to which Transport Scotland and Performance Audit Group require access will be stored. All winter service records are to be uploaded to BEARnet by 3pm the following day after the treatment is completed. Where an issue is identified that requires further clarification this timescale will be extended by one additional working day. For clarity the treatment times run from midday to midday . The remote access for all files stored on the shared area shall be read only access to ensure the integrity of files.

Transport Scotland, Traffic Scotland and PAG shall have read access to the Vaisala Manager system which includes all ice sensor data such as road surface temperature, road surface state and camera images etc. The system can be used to generate various reports in relation to treatments, salt usage etc.

All telephone calls to and from the Network Hub shall be recorded and stored on the BEAR Scotland computer system which can be accessed if required.

The daily winter action plan shall be uploaded to the Traffic Scotland website daily by 15:00 hours.

Item 17 – Snow Pole Location Map

There are no snow poles in the South East Unit. If after any significant snow events it is recommended that snow poles should be provided then after consultation with TS they will be installed Sch 2 Cl 6.2.43

Item 18 - Snow Gates

18.1 Maintenance, Liaison and Operation

Prior to the commencement of the winter service period the snow gates shall be inspected to ensure they are functional and of effective appearance throughout the winter service period.

Item 19 - Variable Message Snow and Ice Folding Message Signs

19.1 BEAR Scotland will open snow and ice folding message signs as shown in Appendix WSP7 prior to 1 October each year to check their functionality. Any maintenance work required will be carried out. Thereafter signs will be used as required to provide information to the road user regarding weather and road conditions.

Item 20 – Salt Bins

Salt bins will be strategically positioned to assist in the carrying out of footway treatments by 30 September each year. Locations are detailed in Appendix WSP8 Locations of Winter Service Infrastructure.

Any missing or damaged salt bin will be replaced within 48 hours of the defect being known.

At the end of each winter seasons the salt bins will be returned to depots, cleaned and any maintenance required undertaken.

Despite the increased level of Category A precautionary treatments in the NMC it is proposed that all existing salt bin locations are retained as these are most likely to be used during significant snow events.

20.1 Stock Level Monitoring and Replenishment Procedures

Salt bin level monitoring will be undertaken by the safety inspectors and the operational staff carrying out precautionary footway treatments. Replenishment will be undertaken as required.

Item 21 – Salt Measurement Apparatus

21.1 Equipment and locations and recording methods

At our depots in Rosyth, Burghmuir, Lochgelly, Bonnyrigg, Chryston, Eyemouth and Charlesfield weighbridges are installed in order to accurately record the quantities of salt being used.

Spreaders will be weighed at the start and end of each treatment. These weights will be phoned through to the Network Hub and recorded. For the 2024/25 season it is intended to introduce a system where weighbridge weights are automatically downloaded to the Network Hub. It is hoped to develop this system over time to eliminate the need for weighbridge tickets .
Should usage be 10% below the targeted weight for the precautionary treatment of the route then then a retreatment of the entire route will be undertaken unless the forecast or actual hazard for ice or snow has passed.

The facilities proposed will also be calibrated in accordance with manufacturer's instructions in September and January each year and records maintained in the BEAR Scotland Management System.

Each depot will have brine manufacture and storage facilities capable of holding sufficient brine that would allow treatment of all routes simultaneously from that depot at maximum spread rates plus an additional 20 per cent above the minimum to be held in reserve. See Appendix WSP21 De-icing Material Stock - Brine Production and Storage.

The brine tanks produce and maintain a concentration level of 23% which can be checked on a digital read-out. Daily checks will be carried out using a refractometer (saturation meter) and records held in the BEAR Scotland Management System.

Appendix WSP1 – Precautionary Treatment Routes 20 g/m^2 and 40 g/m^2

Summary of 20 g/m^2 Treatment Routes

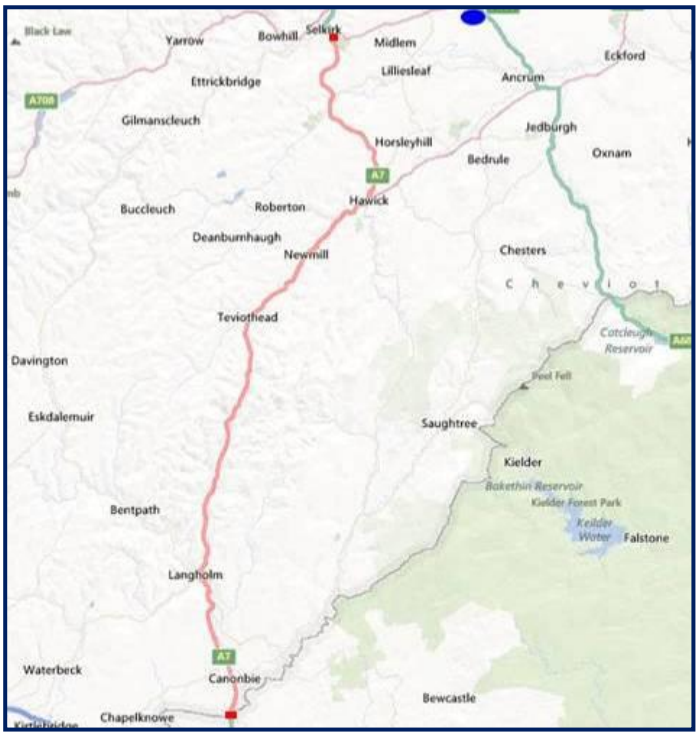
Route No.	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km)	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @20g/m^2 (tonne)	Route Tonnage @40g/m^2 (tonne)	Treatment type
SE20R01	Charlesfield	A7 as per route card	12.8	12.8	67.2	67.2	48	84.0	90.1	40%	7.3	As per route card	9.80		Pre-wet salt
SE20R02	Charlesfield	A7, A6091 and A68 as per route card	12.8	12.8	86.3	53.3	56	92.5	6.5	50%	7.4	As per route card	7.89		Pre-wet salt
SE20R03	Eyemouth	A1 as per route card	7.5	7.5	102.6	60.1	56	104.1	9.5	50%	8.8	As per route card	10.63		Pre-wet salt
SE20R04	Charlesfield	A68 as per route card	5.1	5.1	61.1	50.6	56	58	49	44%	8.3	As per route card	8.45		Pre-wet salt
SE20R05	Bonnyrigg	A702 as per route card	13.5	13.5	58.6	58.6	48	73.2	66.9	42%	7.3	As per route card	8.58		Pre-wet salt
SE20R06	Rosyth	A720 and M8 as per route card	15.5	13.7	88.22	33.01	68	71	15.5	27.68%	8.9	As per route card	6.93		Pre-wet salt
SE20R07	Bonnyrigg	A1 as per route card	8.7	8.7	130.8	79.27	68	115	8.7	52%	8.9	As per route card	13.62		Pre-wet salt
SE20R08	Burghmuir	M8 and M9 as per route card	12.8	12.8	86.4	68	68	76	10.5	39.92%	10.2	As per route card	8.65		Pre-wet salt

Route No.	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km)	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @20g/m^2 (tonne)	Route Tonnage @40g/m^2 (tonne)	Treatment type
SE20R09	Burghmuir	M8 and M9 as per route card	10.7	10.7	81.1	45.2	68	71	12.6	43.29%	10.1	As per route card	9.31		Pre-wet salt
SE20R10	Burghmuir	M9 as per route card	1.1	1.1	100.5	54.3	68	88.7	13.5	47%	10.3	As per route card	11.26		Pre-wet salt
SE20R11	Burghmuir	M9 as per route card	7.8	7.8	86.2	60.2	68	76.5	6.0	56%	10.4	As per route card	12.37		Pre-wet salt
SE20R12	Chryston	M80 and M876 as per route card	15.0	15.0	118.3	59.2	68	104.3	23.7	38%	10.4	As per route card	12.26		Pre-wet salt
SE20R13	Lochgelly	A90, M9 and M90 as per route card	13.7	11.7	84.4	37.3	64	72.4	13.7	33%	10.6	As per route card	7.90		Pre-wet salt
SE20R14	Lochgelly	A977, A985, and M823 as per route card	8.9	13.0	87.3	48.5	56	93.5	41	34.9%	8.4	As per route card	7.78		Pre-wet salt
SE20R15 A	Rosyth	Queensferry Crossing, Forth Road Bridge, , as per route card	3.6	3.6	52.65	17.15	56	49	2.3	29.29%	7.3	As per route card	1950 litres	(15.6ml/ m2)	Potassium Acetate
SE20R15 B	Rosyth	Kincardine Bridge and Clackmannanshire Bridge, as per route card	20.7	19.5	15.2	7.4	56	15	20.7	13.07	7.3	As per route card	841 litres	(15.6ml/ m2)	Potassium Acetate

Route No.	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km)	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @20g/m^2 (tonne)	Route Tonnage @40g/m^2 (tonne)	Treatment type
SE20R16	Bonnyrigg	A720 and A1 as per route card	6.3	5.5	94.21	67.55	56	83	6.3	63.24%	8.6	As per route card	10.97		Pre-wet salt

COVID-19 Treatment Routes have been developed in case of a significant driver shortage. A table of routes in available in Appendix WSP29.

Depot:	Charlesfield	**Route:**	**SE20R01**
Spread Rate:	Up to 20g/m²	**Route Length:**	67.2 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	67.2 km
Depot to Route:	12.8 km	**Route Time:**	84.0 mins
Depot to Route:	12.8 mins	**Route Coverage:**	9.80 tonnes
Route to Depot:	90.1 km	**Route Average Width:**	7.3 m
Route to Depot:	90.1 mins	**Route Average Speed:**	48 km/h



A = 12.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 67.2 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 67.2 km – Total Distance treated from 2. start of route to 3. end of route (km)

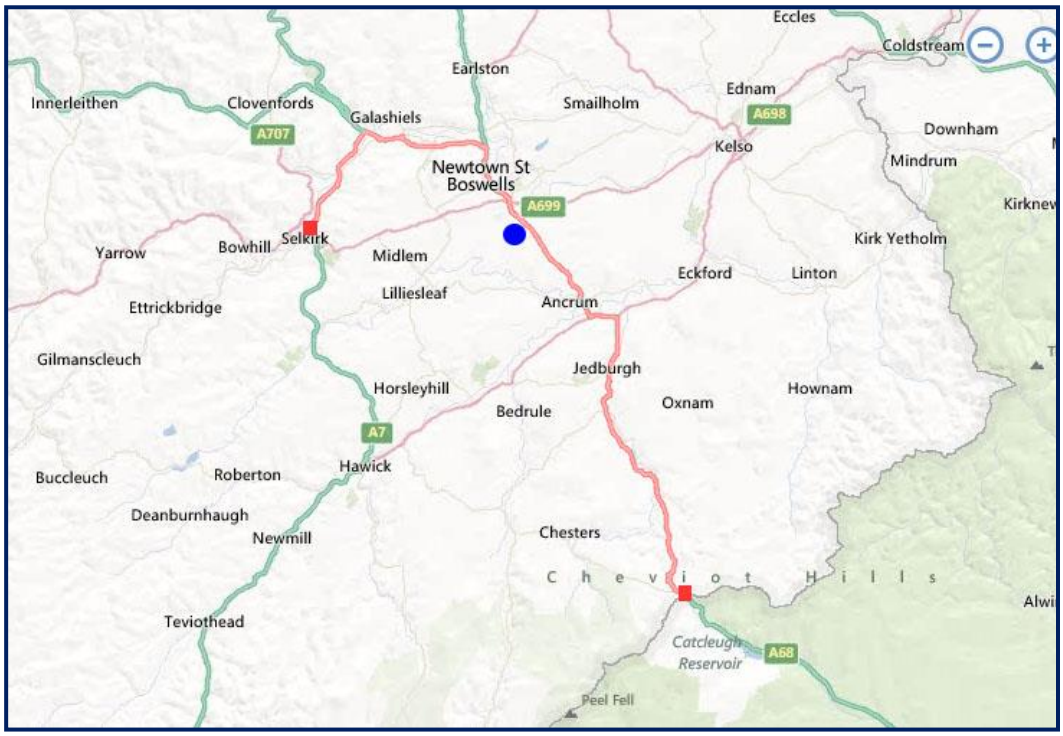
D = 90.1 km – Distance from 3. end of route to 1. Depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 170.1) x 67.2 = 40%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A7	South	End of 30mph zone, Selkirk to Galalaw Roundabout	14.5	2.12
SALT	A7	South	Galalaw Roundabout	0.1	0.02
SALT	A7	South	Galalaw Roundabout to Dovemont Place Roundabout	1.7	0.25
SALT	A7	South	Dovemont Place Roundabout	0.1	0.02
SALT	A7	South	Dovemont Place Roundabout to Sandbed Roundabout	0.9	0.13
SALT	A7	South	Sandbed Roundabout	0.1	0.01
SALT	A7	South	Sandbed Roundabout to end of 30mph zone, Hawick	1.1	0.15
SALT	A7	South	End of 30mph zone, Hawick to Newmill junction	5.8	0.85
SALT	A7	South	Newmill to start of 30mph zone at Langholm	29.7	4.34
SALT	A7	South	Start of 30mph zone to end of 30mph zone at Langholm	2	0.28
SALT	A7	South	End of 30mph zone at Langholm to national boundary	11.2	1.63
			Totals	**67.2**	**9.80**

Depot:	Charlesfield	**Route:**	**SE20R02**
Spread Rate:	Up to 20g/m²	**Route Length:**	86.3 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	53.3 km
Depot to Route:	12.8 km	**Route Time:**	92.5 mins
Depot to Route:	12.8 mins	**Route Coverage:**	7.89 tonnes
Route to Depot:	6.5 km	**Route Average Width:**	7.4 m
Route to Depot:	6.5 mins	**Route Average Speed:**	56 km/h



A = 12.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 86.3 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 53.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 6.5 km – Distance from 3. end of route to 1. Depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 105.6) x 53.3 = 50%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A7	South	Start of 30mph zone, Selkirk to end of 30mph zone, Selkirk	2.6	0.38
SALT	A7	South	Kingsknowe Roundabout to start of 30mph zone, Selkirk	6.5	0.95
SALT	A7		Kingsknowe Roundabout	0.2	0.03
SALT	A6091	West	Tweedbank Roundabout to Kingsknowe Roundabout	1	0.2
SALT	A6091		Tweedbank Roundabout	0.3	0.05
SALT	A6091	West	Melrose Roundabout to Tweedbank Roundabout	1.3	0.26
SALT	A6091		Melrose Roundabout	0.3	0.05
SALT	A6091	West	Ravenswood Roundabout to Melrose Roundabout	5.3	0.77
SALT	A68	South	Ravenswood Roundabout	0.2	0.03
SALT	A68	South	Ravenswood Roundabout to Jedburgh	16.6	2.42
SALT	A68	South	Start of 30mph zone to end of 30mph zone, Jedburgh	2.2	0.32
SALT	A68	South	End of 30mph zone, Jedburgh to national boundary	15.9	2.32
Turn Around			National boundary	0.2	
Travel	A68	North	National boundary to A698 junction	21.9	
SALT	A68	North	A698 junction	0.3	0.03
Travel	A68	North	A698 junction to Newtown St Boswell south junction	9.9	
SALT	A68	North	Newtown St Boswell south junction	0.3	0.04
Travel	A68	North	Newtown St Boswell south junction to Newtown St Boswell north junction	1	
SALT	A68	North	Newtown St Boswell north junction	0.3	0.04
			Totals	**86.3**	**7.89**

Depot:	Eyemouth	**Route:**	**SE20R03**
Spread Rate:	Up to 20g/m²	**Route Length:**	102.6 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	60.1 km
Depot to Route:	7.5 km	**Route Time:**	104.1 mins
Depot to Route:	7.5 mins	**Route Coverage:**	10.63 tonnes
Route to Depot:	9.5 km	**Route Average Width:**	8.8 m
Route to Depot:	9.5 mins	**Route Average Speed:**	56 km/h

A = 7.5 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 102.6 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 60.1 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 9.5 km – Distance from 3. end of route to 1. Depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 119.6) x 60.1 = 50.25%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage
SALT	A1	South	Start of dual carriageway at Lamberton to national boundary	1.2	0.25
Travel	A1	South	National boundary to Berwick Upon Tweed	2.9	
Turn	A1		Berwick Upon Tweed Roundabout		
Travel	A1	North	Berwick Upon Tweed to national boudary	2.9	
SALT	A1	North	National boundary to end of dual carriageway at Lamberton	1.2	0.25
Salt	A1	North	End of dual carriageway at Lamberton to start of dual carriageway at Lemington	11.9	2.09
SALT	A1	North	Start of dual carriageway at Lemington to end of dual carriageway at Houndwood	3.9	0.68
Salt	A1	North	End of dual carriageway at Houndwood to start of dual carriageway at Penmanshiel	5.8	1.02
SALT	A1	North	Start of dual carriageway at Penmanshiels to end of dual carriageway at Penmanshiels	3.0	0.52
Salt	A1	North	End of dual carriageway at Penmanshiels to Cockburnspath Roundabout	2.5	0.44
SALT	A1		Cockburnspath Roundabout	0.2	0.02
Salt	A1	North	Cockburnspath Roundabout to start of dual carriageway at Torness	3.9	0.68
SALT	A1	North	Start of dual carriageway to end of dual carriageway at Torness	0.5	0.08
Salt	A1	North	End of dual carriageway at Torness to start of dual carriageway at Thurstoon Manor	2	0.35
SALT	A1	North	Start of dual carriageway at Thurston Manor to Spott Roundabout	4.8	0.89
SALT	A1		Spott Roundabout	0.2	0.03
SALT	A1	North	Spott Roundabout to Thistly Cross Roundabout	3	0.52
SALT	A1		Thistly Cross Roundabout	0.2	0.03
SALT	A1	South	Thistly Cross Roundabout to Spott Roundabout	3	0.52
SALT	A1	South	Spott Roundabout to end of dual carriageway at Thurston Manor	4.8	0.89
Travel	A1	South	End of dual carriageway at Thurston Manor to start of dual carriageway at Torness	2.0	

Operation	Route	Direction	Route Description	Distance (km)	Tonnage
SALT	A1	South	Start of dual carriageway to end of dual carriageway at Torness	0.5	0.09
Travel	A1	South	End of dual carriageway at Torness to Cockburnspath Roundabout	3.9	
Travel	A1	North	Cockburnspath Roundabout to Torness access	4.1	
SALT	A1	North	Torness crossover point	0.2	0.03
Travel	A1	North	Torness access to Spott Roundabout	7.1	
Turn	A1		Spott Roundabout		
Travel	A1	South	Spott Roundabout to Torness access	7.1	
SALT	A1	South	Torness access deceleration lane	0.2	0.03
SALT	A1	South	Torness access acceleration lane	0.2	0.03
Travel	A1	South	Torness access to Cockburnspath Roundabout	4.2	
Travel	A1	South	Cockburnspath Roundabout to start of dual carriageway at Penmanshiel	2.5	
SALT	A1	South	Start of dual carriageway at Penmanshiel to end of dual carriageway at Penmanshiel	3.0	0.52
Travel	A1	South	End of dual carriageway at Penmanshiel to start of dual carriageway at Houndwood	5.8	
SALT	A1	South	Start of dual carriageway at Houndwood to end of dual carriageway at Lemington	3.9	0.68
			Totals	**102.6**	**10.63**

Depot:	Charlesfield	**Route:**	**SE20R04**
Spread Rate:	Up to 20g/m²	**Route Length:**	61.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	50.6 km
Depot to Route:	5.1 km	**Route Time:**	65.5 mins
Depot to Route:	5.1 mins	**Route Coverage:**	8.45 tonnes
Route to Depot:	49 km	**Route Average Width:**	8.3 m
Route to Depot:	46 mins	**Route Average Speed:**	56 km/h

A = 5.1 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 61.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 50.6 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 49 km – Distance from 3. end of route to 1. Depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 115.2) x 50.6 = 44%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A68		Ravenswood Roundabout	0.2	0.03
SALT	A68	North	Ravenswood Roundabout to start 30mph zone Earlston	3.5	0.68
SALT	A68	North	Start of 30mph zone to end of 30mph zone, Earlston	1.3	0.19
SALT	A68	North	End of 30mph zone, Earlston to Birkenside junction	4.3	0.62
SALT	A68	North	Birkenside junction to Lauder	5.9	0.87
SALT	A68	North	Start of 30mph zone to end of 30mph zone, Lauder	1.5	0.21
SALT	A68	North	Lauder to Carfraemill Roundabout	5.8	0.84
SALT	A68	North	Carfraemill Roundabout	0.2	0.02
SALT	A68	North	Carfraemill Roundabout To Start of three lane section at Soutra	3	0.43
SALT	A68	North	Start of three lane section to end of three lane section at Soutra	6.3	1.38
SALT	A68	North	End of three lane section at Soutra to Pathhead	8	1.17
SALT	A68	North	Start of 30mph zone, Pathhead to End of 30mph zone	0.9	0.13
SALT	A68	North	Pathhead to Start of Dalkeith Bypass	2.1	0.43
SALT	A68	North	Start of Dalkeith Bypass to end of Dalkeith Bypass	3.6	0.79
SALT	A68	North	End of Dalkeith Bypass to South roundabout at Millerhill Interchange.	1.5	0.29
SALT	A68		South roundabout at Millerhill Interchange	0.1	0.02
SALT	A68	North	south roundabout at Millerhill Interchange to North roundabout.	0.1	0.01
SALT	A68		North roundabout at Millerhill Interchange	0.1	0.02
SALT	A720	East	Millerhill on slip	0.3	0.05
Travel	A720	East	Millerhill on slip to Old Craighall Rbt	1.1	
Travel	A720	West	Old Craighall Rbt to Millerhill off slip	1.1	
SALT	A720	West	Millerhill off slip and on slip west bound	0.9	0.15
Travel	A720	West	Millerhill on slip to Sheriffhall rbt	1.9	
Travel	A720	West	Sheriffhall rbt to Millerhill on slip	1.9	
SALT	A720	East	Millerhill off slip	0.4	0.06
Travel	A68		Millerhill Interchange to Salter Road Junction	1.5	
SALT	A68	South	Salters Road Junction	0.3	0.03
Travel	A68		Salters Road junction to Fordel Mains Junction	3	
SALT	A68	South	Fordel Mains Junction	0.3	0.03

				61.1	**8.45**

Depot:	Bonnyrigg	**Route:**	**SE20R05**
Spread Rate:	Up to 20g/m²	**Route Length:**	58.6 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	58.6 km
Depot to Route:	13.5 km	**Route Time:**	73.2 mins
Depot to Route:	13.5 mins	**Route Coverage:**	8.58 tonnes
Route to Depot:	66.9 km	**Route Average Width:**	7.3 m
Route to Depot:	66.9 mins	**Route Average Speed:**	48 km/h

A = 13.5 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 58.6 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 58.6 km – Total Distance treated from 2. start of route to 3. end of route (km)

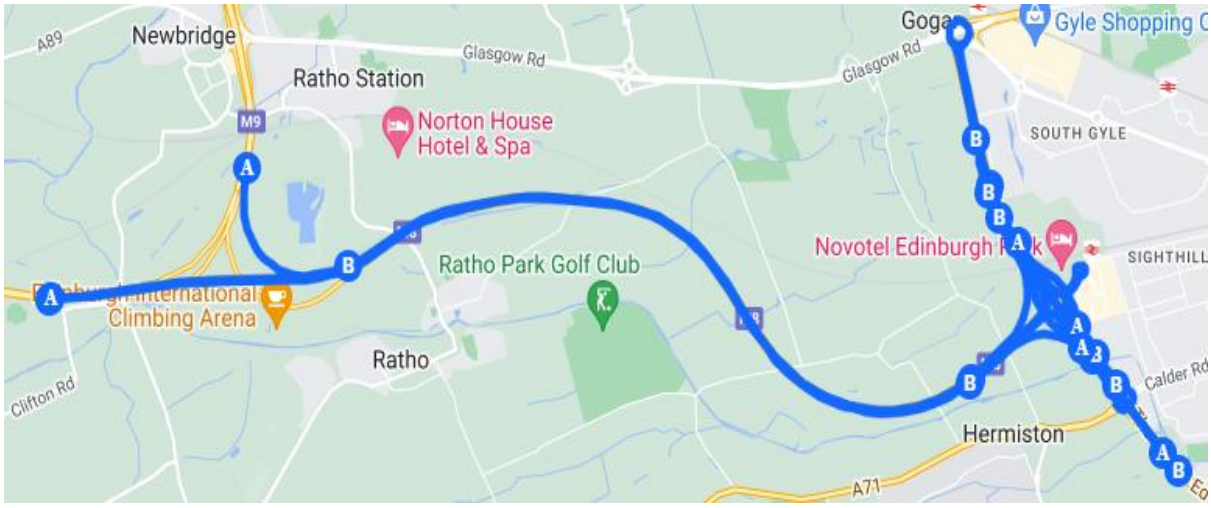
D = 66.9 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 139) x 58.6 = 42%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Chryston or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A702		South roundabout at Lothianburn Interchange	0.1	0.01
SALT	A702	North	South roundabout to north roundabout at Lothianburn Interchange	0.2	0.03
SALT	A702		North roundabout at Lothianburn Interchange	0.1	0.01
SALT	A702	South	North roundabout to south roundabout at Lothianburn Interchange	0.2	0.03
SALT	A702	South	Hillend	0.4	0.06
SALT	A702	South	Hillend to Carlops	15	2.18
SALT	A702	South	Carlops	0.9	0.13
SALT	A702	South	Carlops to West Linton	3.2	0.47
SALT	A702	South	Robins Land Roundabout	0.1	0.01
SALT	A702	South	West Linton	0.7	0.1
SALT	A702	South	West Linton to Melbourne junction	10	1.46
SALT	A703	South	Melbourne junction to Biggar	7.1	1.04
SALT	A702	South	Biggar	2.8	0.41
SALT	A702	South	Biggar to Coulter	3	0.44
SALT	A702	South	Coulter to Maidencots Roundabout	12.2	1.78
SALT	A702		Maidencots Roundabout	0.1	0.02
SALT	A702	South	Maidencots Roundabout to start of dual carriageway	1.4	0.21
SALT	A702	South	Start of dual carriageway to southbound roundabout at Abington interchange	0.2	0.03
SALT	A702		Southbound roundabout at Abington Interchange	0.2	0.03
SALT	A702	South	Southbound roundabout to northbound roundabout at Abington Interchange	0.2	0.04
SALT	A702		Northbound roundabout at Abington Interchange	0.1	0.02
SALT	A702	North	Northbound roundabout to sourthbound roundabout at Abington Interchange	0.2	0.04
SALT	A702	North	Southbound roundabout at Abington Interchange to end of dual carriageway	0.2	0.03
			Totals	**58.6**	**8.58**

Depot:	Rosyth	**Route:**	**SE20R06**
Spread Rate:	Up to 20g/m²	**Route Length:**	88.22km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	33.01km
Depot to Route:	15.5km	**Route Time:**	71 min
Depot to Route:	13.7 min	**Route Coverage:**	6.93t
Route to Depot:	15.5km	**Route Average Width:**	1.05m
Route to Depot:	13.7 min	**Route Average Speed:**	68 km/h



A = 15.5 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 88.22 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 33.01 km – Total Distance treated from 2. start of route to 3. end of route (km)

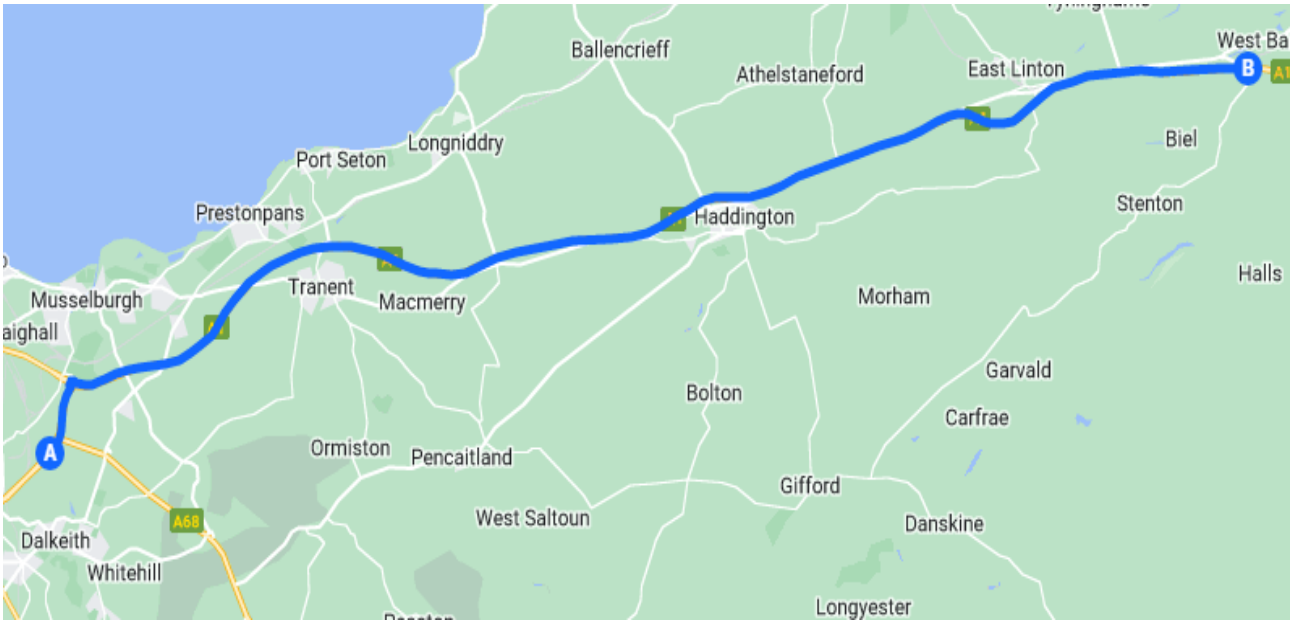
D = 15.5 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 /119.22) x 33.01 = 27.68%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Eyemouth depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
Salt	M8	East	M9 Jct 2 to Gogar Rbt	8.3	1.32
Salt	A720	East	Gogar rbt to End of On slip from Calder	3	0.48
Travel	A720	East	End of On slip from Calder to Off slip at Dreghorn	5	
Travel	A720		Off slip at Dreghorn to On slip Dreghorn	0.072	
Travel	A720	West	On slip Dreghorn to Start of off slip to Calder	5.1	
Salt	A720	West	Start of off slip to Calder to End of on slip from M8	2.3	0.36
Travel	A720	West	End of on slip from M8 to Start of off slip to Hermiston	1.9	
Salt	A720	East	Start of off slip to Hermiston to End of Calder off slip	1.6	0.25
Salt	A720		Calder Rbt	0.35	0.05
Salt	A720	West	Start of Calder on slip to End of on slip from M8	1.5	0.24
Travel	A720		End of on slip from M8 to Start on slip to Hermiston gate RBT	2.8	
Salt	A720	East	Start of on slip to Hermiston gate RBT to Merge at off slip to Calder	0.9	0.14
Travel	A720	East	Merge at off slip to Calder to Dreghorn off slip to Off slip to Hermiston rbt	5.9	
Travel	A720		Dreghorn off slip	5.9	
Salt	A720	West	Off slip to Hermiston rbt to End of on slip towards Gogar	1	0.16
Travel	A720		End of on slip towards Gogar (turn at Gogar) to Merge to Calder	3.5	
Salt	A720	East	Merge to Calder	0.21	0.3
Travel			Merge to Calder to M8 link	1	
Salt	M8	West	M8 link to End of on slip to M9	7.9	1.26
Travel	M9	West	End of on slip to M9 to Jct 3 off slip	6.2	
Salt	M9	West	Jct 3 off slip to Livingston East Rbt	0.24	0.03
Travel	M9	East	To Livingston East Rbt to Jct 2 M8	8.3	
Salt	M8	East	Jct 2 M8 to End of Jct 2 slip from M8	1.6	0.25
Travel	M8	East	End of Jct 2 slip from M8 to Start of off slip to Gogar	4.9	
Salt	M8		Start of off slip to Gogar to Hermiston gait Inc Rbt	1.1	0.17
Salt			Slip into Hermiston Gait to Rbt	0.35	0.56
Salt			Rbt at retail park to End of on slip from A720 to M8	1	0.16
Travel	M8	West	End of on slip from A720 to M8 to Jct 2 slip M8 to M9	4.4	
Salt	M8	West	Jct 2 slip M8 to M9 to End of slip onto M9	1.9	0.3
				88.22	6.93

Depot:	Bonnyrigg	**Route:**	**SE20R07**
Spread Rate:	Up to 20g/m²	**Route Length:**	130.79 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	79.27 km
Depot to Route:	8.7 km	**Route Time:**	115 mins
Depot to Route:	8.7 mins	**Route Coverage:**	13.62 tonnes
Route to Depot:	8.7 km	**Route Average Width:**	8.6 m
Route to Depot:	8.7 mins	**Route Average Speed:**	68 km/h



A = 8.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 137.91 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 80.87 km – Total Distance treated from 2. start of route to 3. end of route (km)

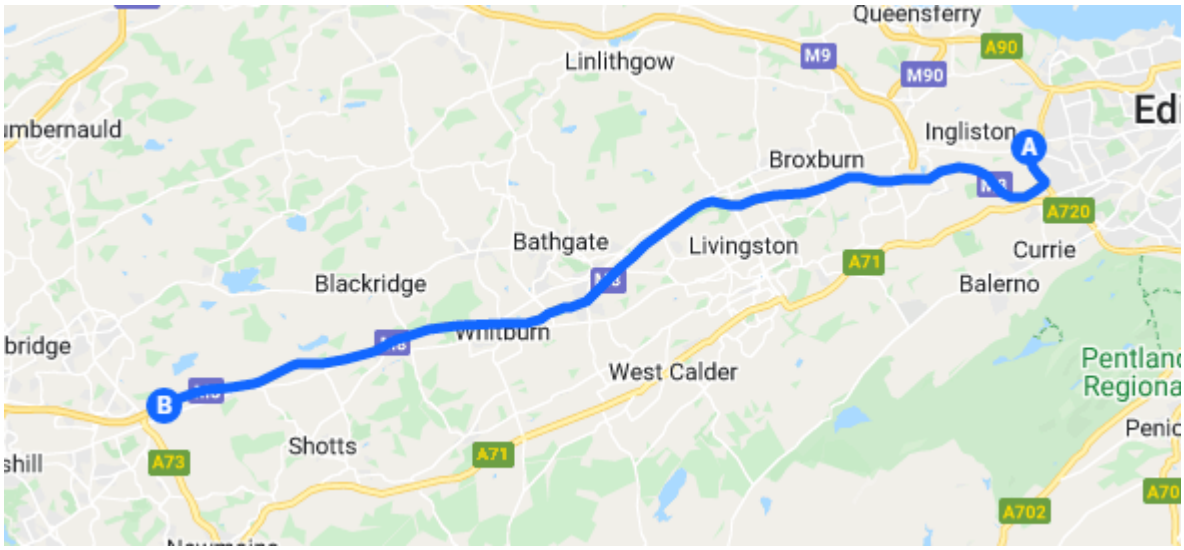
D = 8.7 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 155.31) x 80.87 = 52.2%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Burghmuir depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
Salt	A1	South	Tranent off slip to Thistly Cross rbt	28.1	4.83
Salt	A1	South	Thistly cross rbt	0.17	0.03
Salt	A1	North	Thistly cross rbt to Abbotsview Off slip	13.2	2.27
Salt	A1	North	Abbotsview off slip	0.5	0.09
Travel	A199		Abbotsview off slip to Abbotsview on slip S/B	0.29	0.00
Salt	A1	South	Abbotsview on slip	0.5	0.09
Travel	A1	South	Abbotsview on slip to Thistly Cross rbt	13.4	0.00
Travel	A1	North	Thistly cross rbt to Abbotsview Off slip	13.3	0.00
Salt	A1	North	Abbotsview off slip to Tranent on slip	28.2	4.85
Travel	A1	North	Tranent on slip to Wallyford off slip	1.8	
Salt	A1	North	Wallyford off slip	0.6	0.10
Travel	A1		Wallyford off slip to Wallyford on slip south bound	0.13	
Salt	A1	South	Wallford on slip Southbound	0.35	0.06
Travel	A1	South	Wallford on slip to Tranent off slip	2.1	0.00
Salt	A1	South	Tranent on slip	0.6	0.10
Travel	A1	South	Tranent north on slip to Bankton off slip	1.5	0.00
Salt	A1	South	Bankton south off slip to Bankton south on slip	0.65	0.11
Travel	A1	South	Bankton south off slip to Gladsmuir off slip	3.7	0.00
Salt	A1	South	Gladsmuir off slip to Gladsmuir on slip	1.1	0.19
Travel	A1	South	Gladsmuir on slip to Oaktree North off slip	2.7	0.00
Salt	A1	South	Oaktree north off slip to Oaktree north on slip	0.8	0.14
Travel	A1	South	Oaktree north on slip to Abbotsview South off slip	2.3	0.00
Salt	A1	South	Abbotsview South off slip	0.65	0.11
Travel	A199		Abbotsview off slip to Abbotsview on slip	0.3	0.00
Salt	A1	North	Abbotsview on slip	0.7	0.12
Travel	A1	North	Abboutview on slip to Oaktree north off slip	1.8	0.00
Salt	A1	North	Oaktree off slip to Oaktree on slip	0.7	0.12
Travel	A1	North	Oaktree on slip to Gladsmuir off slip	3.3	0.00
Salt	A1	North	Gladsmuir off slip	0.9	0.15
Travel	A1	North	Gladsmuir on slip to Bankton off slip	3.8	0.00
Salt	A1	North	Bankton off slip to Bankton on slip	0.9	0.15
Travel	A1	North	Bankton on slip to Tranent North off slip	1.1	0.00
Salt	A1	North	Tranent north off slip	0.65	0.11
			Totals	130.79	13.62

Depot:	Burghmuir	**Route:**	**SE20R08**
Spread Rate:	Up to 20g/m²	**Route Length:**	86.4 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	43.8 km
Depot to Route:	12.8 km	**Route Time:**	76 mins
Depot to Route:	12.8 mins	**Route Coverage:**	8.65 tonnes
Route to Depot:	10.5 km	**Route Average Width:**	10.2 m
Route to Depot:	10.5 mins	**Route Average Speed:**	68 km/h



A = 12.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 86.4km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 43.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

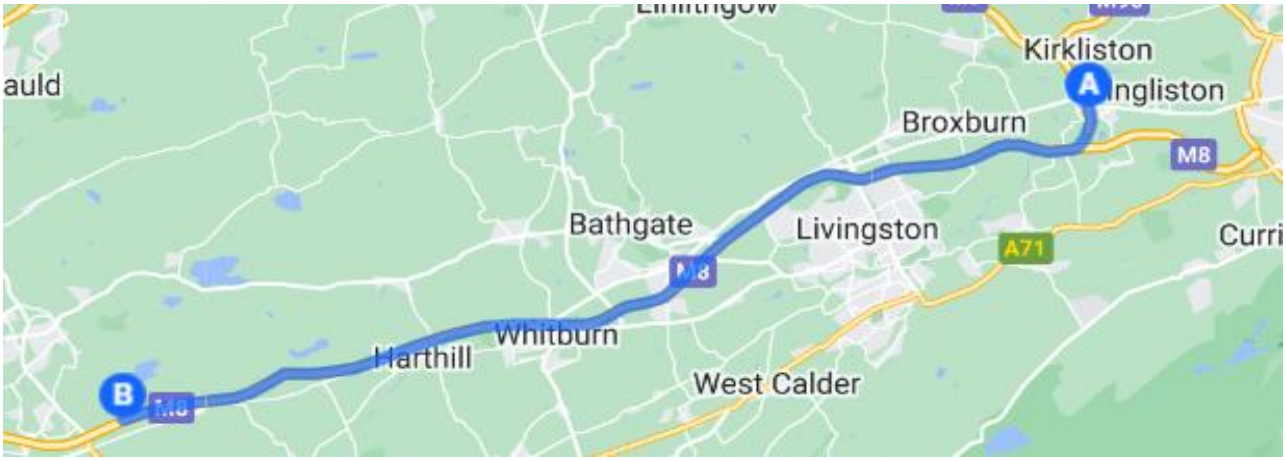
D = 10.5 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 109.7) x 43.8 = 39.92%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Chryston or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	South	J1 dedicated slip to A8 Newbridge	0.2	0.03
Travel	A8	East	Newbridge Roundabout to Edinburgh airport access	2.3	
Turn	A8		Edinburgh airport access	0.9	
Travel	A8	West	Edinburgh airport access to Newbridge Roundabout	2.3	
SALT	M9	West	J1 dedicated on slip	0.1	0.02
Travel	M8	West	J1 End of dedicated on slip to J3	6.4	
Travel	M8	West	J3 off slip	0.2	
SALT	M8	West	J3 dedicated off slip to A899	0.5	0.08
Travel	A899	South	M8 J3 to Huston Interchange	0.6	-
Turn	A889		Huston Interchange	1.3	-
Travel	A899	North	Huston Interchange to M8 J3	1.5	-
SALT	M8	West	J3 on slip	0.5	0.11
Travel	M8	West	J3 to J3a	5.3	
SALT	M8	West	J3a off slip	0.7	0.11
SALT	M8	West	J3a on slip	0.7	0.11
Travel	M8	West	J3 to J4	2.9	
SALT	M8	West	J4 off slip	0.5	0.08
SALT	M8	West	J4 on slip	0.5	0.08
Travel	M8	West	J4 to J4a	2.5	
SALT	M8	West	J4a off slip	0.3	0.05
SALT	M8	West	J4a on slip	0.4	0.06
Travel	M8	West	J4a to Motorway Services	2.9	
SALT	M8	West	Start Harthill Services off slip to end of on slip	0.8	0.06
Travel	M8	West	Motorway Services to J5	2.4	
SALT	M8	West	J5 off slip	0.4	0.06
Turn	B7066		J5	0.5	
SALT	M8	West	J5 on slip	0.5	0.08
Travel	M8	West	J5 to J6	6.4	
Turn			J6	3.2	
SALT	M8	East	J6 to M9 J1A Overbridge	37.7	7.54
			Totals	86.4	8.65

Depot:	Burghmuir	**Route:**	**SE20R09**
Spread Rate:	Up to 20g/m²	**Route Length:**	81.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	45.2 km
Depot to Route:	10.7 km	**Route Time:**	71 mins
Depot to Route:	10.7 mins	**Route Coverage:**	9.13 tonnes
Route to Depot:	12.6 km	**Route Average Width:**	10.1 m
Route to Depot:	12.6 mins	**Route Average Speed:**	68 km/h



A = 10.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 81.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 45.2 km – Total Distance treated from 2. start of route to 3. end of route (km)

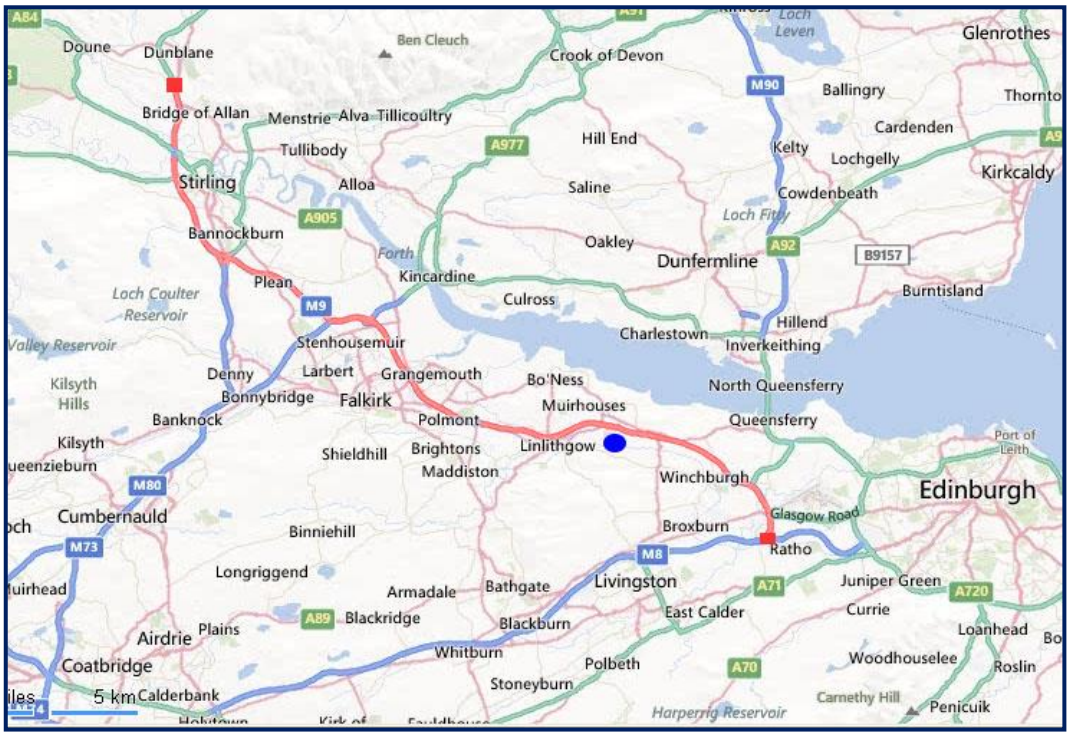
D = 12.6 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 104.4) x 45.2 = 43.29%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Chryston or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	South	J1a overbridge to M8 J2	3	0.64
SALT	M8	West	J2 on slip	1.5	0.32
SALT	M8	West	J2 to J6	32.9	6.64
Turn	M8		J6	3.2	
Travel	M8	East	J6 to J5	6.4	
SALT	M8	East	J5 off slip	0.5	0.11
Turn	B7066		Hirst Road	1	
SALT	M8	East	J5 on slip	0.5	0.11
Travel	M8	East	J5 to Harthill Services	2.6	
SALT	M8	East	Start Harthill Services off slip to end of on slip	0.8	0.06
Travel	M8	East	Harthill services to J4a	2.9	
SALT	M8	East	J4a off slip	0.3	0.05
SALT	M8	East	J4a on slip	0.3	0.05
Travel	M8	East	J4a to J4	2.6	
SALT	M8	East	J4 off slip	0.4	0.06
SALT	M8	East	J4 on slip	0.5	0.08
Travel	M8	East	J4 to J3a	3.8	
SALT	M8	East	J3a off slip	0.3	0.06
SALT	M8	East	J3a on slip	0.4	0.06
Travel	M8	East	J3a to J3	4.3	
SALT	M8	East	J3 off slip	1.5	0.32
SALT	M8	East	J3 on slip	1.1	0.18
Travel	M8	East	J3 to J2	7.2	
SALT	M8	East	J2 off slip	1	0.21
Travel	M9	North	M8 J2 to J1	0.6	
Travel	M9	North	J1 off slip	0.3	
SALT	M9	North	J1 dedicated off slip	0.1	0.02
Turn	U/C		Old Liston Road	1	
SALT	M9	North	Dedicated on slip	0.1	0.02
			Totals	82.4	8.08

Depot:	Burghmuir	**Route:**	**SE20R10**
Spread Rate:	Up to 20g/m²	**Route Length:**	100.5 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	54.3 km
Depot to Route:	1.1 km	**Route Time:**	88.7 mins
Depot to Route:	1.1 mins	**Route Coverage:**	11.26 tonnes
Route to Depot:	13.5 km	**Route Average Width:**	10.3 m
Route to Depot:	13.5 mins	**Route Average Speed:**	68 km/h



A = 1.1 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 100.5 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 54.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 13.5 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 115.1) x 54.3 = 47%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Rosyth or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	South	J3 on slip	0.5	0.08
Travel	M9	South	J3 to J2	2.2	
SALT	M9	South	J2 off slip	0.4	0.06
Turn	B8046		J2	0.1	
SALT	M9	North	J2 on slip	0.4	0.06
Travel	M9	North	J2 to J3	2.3	
SALT	M9	North	J3 off slip	0.5	0.08
Turn	A803		J3	0.16	
Travel	M9	South	J3 to J1	10.5	
Turn	M9		J1	1.9	
Travel	M9	North	J1 to J1a overbridge	1.6	
SALT	M9	North	J1a overbridge to J11 Keir Roundabout	48.2	10.22
Turn	A9		Keir Roundabout	0.4	
Travel	M9	South	J11 Keir Roundabout to J10	4	
SALT	M9	South	J10 off slip	0.6	0.1
SALT	M9	South	J10 on slip	0.5	0.08
Travel	M9	South	J10 to J9	6.4	
SALT	M9	South	J9 off slip	0.5	0.08
SALT	M9	South	J9 on slip	0.8	0.13
Travel	M9	South	J9 to J5	14.3	
SALT	M9	South	J5 off slip	0.3	0.05
Travel	A905	South	J5 off slip to J5 on slip	1.1	
SALT	M9	South	J5 on slip	0.6	0.13
Travel	M9	South	J5 to J4	1.2	
SALT	M9	South	J4 off slip	0.6	0.13
SALT	M9	South	J4 on slip	0.4	0.06
			Totals	**100.5**	**11.26**

Depot:	Burghmuir	**Route:**	**SE20R11**
Spread Rate:	Up to 20g/m²	**Route Length:**	86.2 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	60.2 km
Depot to Route:	7.8 km	**Route Time:**	76.5 mins
Depot to Route:	7.8 mins	**Route Coverage:**	12.37 tonnes
Route to Depot:	13.8 km	**Route Average Width:**	10.4 m
Route to Depot:	13.8 mins	**Route Average Speed:**	68 km/h

A = 7.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 86.2 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 60.2 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 13.8 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 107.8) x 60.2 = 56%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	North	J4 off slip	0.5	0.08
SALT	M9	North	J4 on slip	0.6	0.13
Travel	M9	North	J4 to J5	1.3	
SALT	M9	North	J5 off slip	0.6	0.13
SALT	M9	North	J5 on slip	0.4	0.06
Travel	M9	North	J5 to J7	6.1	
SALT	M9	North	J7 off slip	1.4	0.3
SALT	M876	East	M9 J7 to Higgins Neuk Roundabout	3	0.64
Travel	M876	West	Higgins Neuk Roundabout to J7 on slip	3.1	
SALT	M9	South	J7 on slip	0.9	0.2
Travel	M9	South	J7 to J6	2.8	
SALT	M9	South	J6 off slip	0.5	0.11
Turn	A905		J6 off slip to J6 on slip	1	
SALT	M9	North	J6 on slip	0.5	0.11
SALT	M9	North	J9 off slip	0.5	0.08
SALT	M9		J9 Pirnhall Roundabout	0.8	0.13
SALT	M9	North	J9 on slip	0.8	0.13
Travel	M9	North	J9 to J10	7.4	
SALT	M9	North	J10 off slip	0.7	0.11
SALT	M9	North	J10 on slip	0.6	0.1
Travel	M9	North	J10 to J11 Keir Roundabout	3.9	
Turn	A9		Keir Roundabout	0.4	
SALT	M9	South	J11 Keir Roundabout to J1a overbridge	48.4	10.06
			Totals	**86.2**	**12.37**

Depot:	Chryston	**Route:**	**SE20R12**
Spread Rate:	Up to 20g/m²	**Route Length:**	118.3 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	59.2 km
Depot to Route:	15.0 km	**Route Time:**	104.3 mins
Depot to Route:	15.0 mins	**Route Coverage:**	12.26 tonnes
Route to Depot:	23.7 km	**Route Average Width:**	10.4 m
Route to Depot:	23.7 mins	**Route Average Speed:**	68 km/h

A = 15.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 118.3 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 59.2 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 23.7 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 157) x 59.2 = 38%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M80	East	J7 Haggs Interchange to M876	1.2	0.25
SALT	M876	East	M80 to M9 J8	8.9	1.89
SALT	M9	East	J8 to J7	1.4	0.3
SALT	M9	East	J7 off slip	0.9	0.19
Travel	M876	East		0.7	
SALT	M876	East	J3 Bowtrees off slip	0.7	0.11
SALT	M876	East	J3 Bowtrees on slip	0.5	0.08
Travel	M876	East	J3 to Higgins Neuk Roundabout	1.6	
SALT	M876	West	Higgins Neuk Roundabout to M9 J7	3.2	0.68
SALT	M9	West	J7 on slip to M9 J8	2.7	0.57
SALT	M876	West	M9 J8 to M80	8.4	1.78
SALT	M80	West	M876 to J7 Haggs Interchange	1.4	0.3
Turn	M80		J7 Haggs Interchange	1.2	
Travel	M876	East	M80 J7 Haggs Interchange to J1	4.7	
SALT	M876	East	J1 off slip Checkbar	0.3	0.05
Turn	A883		Checkbar Roundabout	1.1	
SALT	M876	East	J1 on slip	0.2	0.03
Travel	M876	East	J1 to J2	1.8	
SALT	M876	East	J2 off slip	1.1	0.23
Travel	A9		Stirling Road	0.6	
SALT	M876	East	J2 on slip	0.5	0.08
Travel	M876	West	J2 to Higgins Neuk Roundabout	7.9	
Travel	M876	West	Higgins Neuk Roundabout to J3	1.2	
SALT	M876	West	J3 Bowtrees off slip	0.7	0.11
SALT	M876	West	J3 Bowtrees on slip	0.4	0.06
Travel	M876	West	J3 Bowtrees to J2 Glenbervie	5.9	
SALT	M876	West	J2 off slip - turn left	0.4	0.06
Travel	A9		Stirling Road	0.5	
SALT	M876	West	J2 on slip	1.1	0.18
Travel	M876	West	J2 to J1	1.2	
SALT	M876	West	J1 off slip Checkbar	0.3	0.05
Travel	B905 / A8004		Denny Road / Checkbar Roundabout	1.1	
SALT	M876	West	J1 on slip Checkbar	0.3	0.05
Travel	M876	West	M80 J7 Haggs Interchange	4	
Turn	M80		J7 Haggs Interchange	1.2	
SALT	M80	North	J7 Haggs Interchange to M9	11.6	2.46
Travel	M9	North	M80 to J10 Craigforth	5.4	
Turn	M9		J10 Craigforth	1.9	
Travel	M9	South	J10 to M80	5.8	
SALT	M80	South	M9 to J7 Haggs Interchange	11.1	2.35
Turn	M80		J7 Haggs Interchange	1.2	
Travel	M80	North	J7 Haggs Interchange to J9 Pirnhall	9.3	
SALT	M80	North	J9 off slip to Pirnhall Roundabout	1	0.21
Turn	M9		Pirnhall Roundabout	0.8	
SALT	M80	South	J9 on slip from Pirnhall Roundabout	0.9	0.19
			Totals	**118.3**	**12.26**

Depot:	Lochgelly	**Route:**	**SE20R13**
Spread Rate:	Up to 20g/m²	**Route Length:**	84.38 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	53 km
Depot to Route:	13.7 km	**Route Time:**	84.5 mins
Depot to Route:	11.75 mins	**Route Coverage:**	7.90 tonnes
Route to Depot:	13.7 km	**Route Average Width:**	10.0 m
Route to Depot:	11.75 mins	**Route Average Speed:**	64 km/h

A = 13.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 84.38 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 37.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

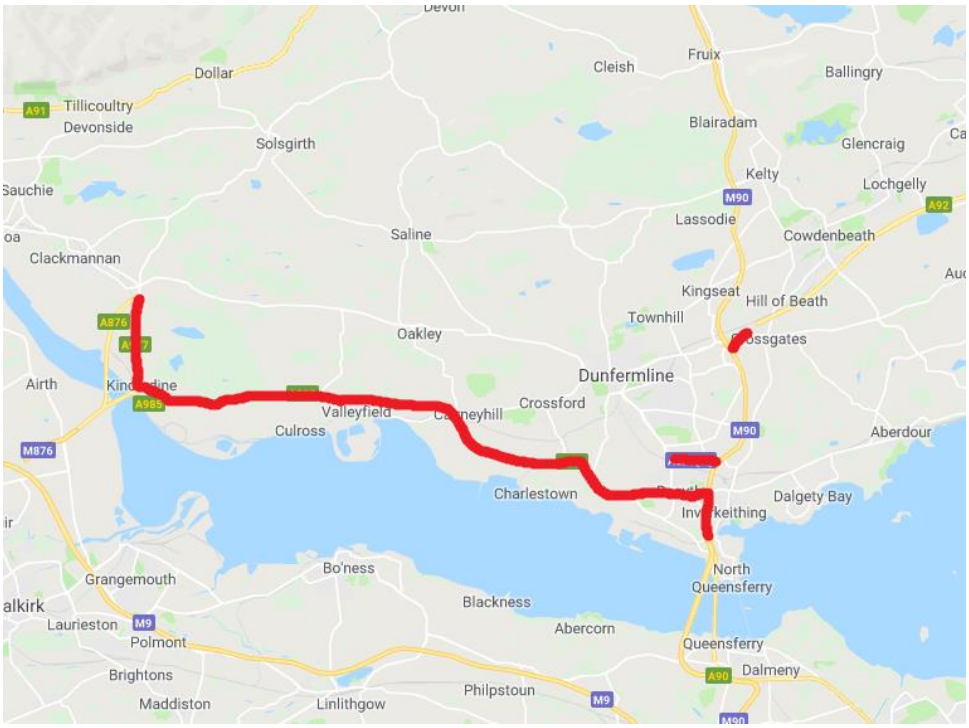
D = 13.7 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 111.7) x 37.3 = 33%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Bonnyrigg depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M90	South	J3 Halbeath to J1B Ferrytoll	7.7	1.63
Travel	M90	South	J1B to J1A (Queensferry Crossing)	4.3	
SALT	M90	South	J1A Queensferry to M9 J1A Kirkliston	6.2	1.31
SALT	M9	South	J1a on slip (fork left)	0.5	0.11
SALT	M9	South	J1a to J1 Newbridge	0.7	0.15
SALT	M9	South	J1 off slip Newbridge	1.1	0.23
Turn	A8		Newbridge Roundabout	0.3	
SALT	M9	North	J1 on slip	0.5	0.11
SALT	M9	North	J1 to J1A Kirkliston	1.4	0.3
SALT	M9	North	J1A Kirkliston off slip	1.3	0.28
SALT	M90	North	J1A Kirkliston off slip to J1A off slip Queenferry RBT	5.9	1.25
Travel	A90	East	Turn A904 Queensferry RBT	0.28	
SALT	M90	South	J1A on slip	0.4	0.08
Travel	M90	East	End of Jct1A on slip to Scotstoun Jct	2.0	
SALT	A90	East	Scotstoun Junction to Dalmeny	0.7	0.15
Travel	A90	East	Dalmeny to Burnshot Junction	2.9	
Turn	A90		Burnshot Junction	0.7	
Travel	A90	West	Burnshot Junction to Dalmeny	2.9	
SALT	A9	West	Dalmeny to Scotstoun junction	0.9	0.19
Travel	M90	North	Scotstoun junction to J1A Queensferry	2.3	
Turn	A904		A904 Queensferry Roundabout	0.3	
Travel	M90	South	J1B to M9 J1A Kirkliston	5.7	
SALT	M9	West	J1A on slip (fork right)	1.1	0.23
Travel	M9	West	J1A to J3	9.3	
Turn	A804		J3 Burghmuir	0.2	
Travel	M9	East	J3 to J1A Kirkliston	9.3	
SALT	M9	North	J1A Kirkliston off slip	0.8	0.17
Travel	M90	North	J1A Kirkliston off slip to J1A Queensferry	2.4	
Salt	M90	North	J1A Queensferry off slip to Mid-way J1A overbridge	0.4	0.08
Travel	M90	North	Jct1A to J1B Ferrytoll	4.2	
SALT	M90	North	J1B Ferrytoll to end of J3 Halbeath	7.7	1.63
				84.38	**7.90**

Depot:	Rosyth	**Route:**	**SE20R14**
Spread Rate:	Up to 20g/m²	**Route Length:**	88.3 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	53 km
Depot to Route:	4.8 km	**Route Time:**	80.0 mins
Depot to Route:	4.8 mins	**Route Coverage:**	8.32 tonnes
Route to Depot:	24.3 km	**Route Average Width:**	8.4 m
Route to Depot:	24.3 mins	**Route Average Speed:**	56 km/h



A = 4.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 75 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 45.1 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 24.3 km – Distance from 3. end of route to 1. depot

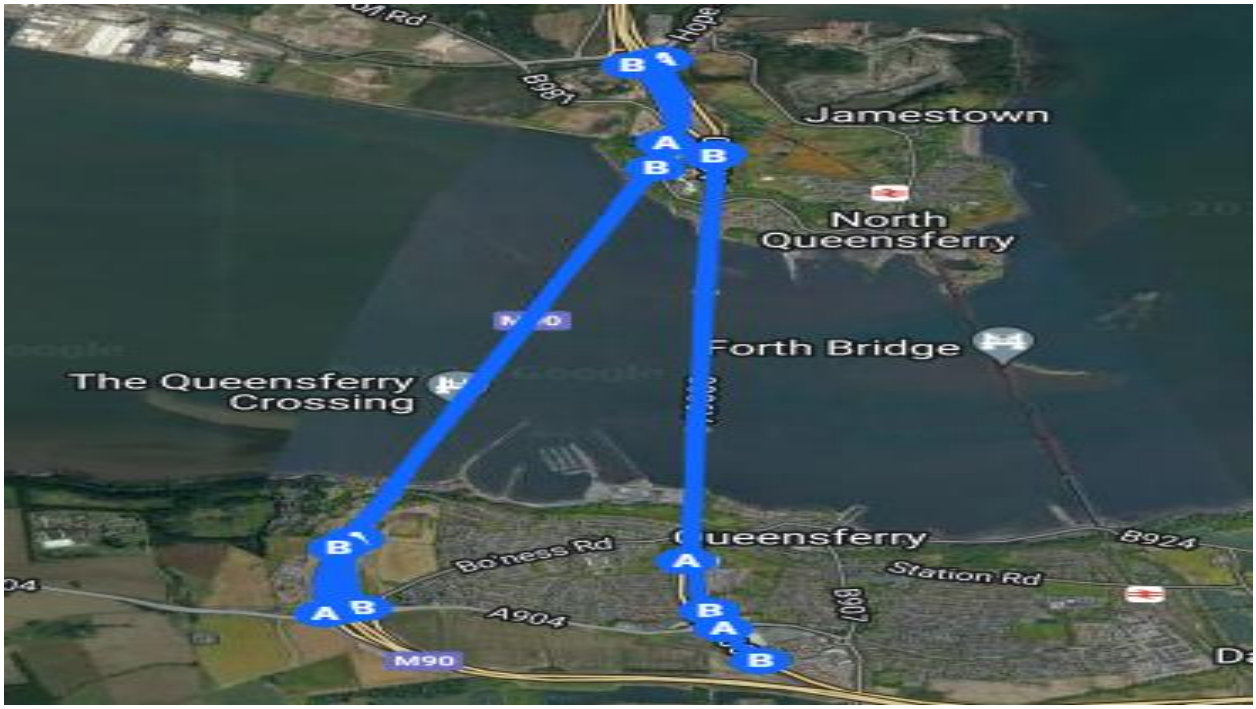
E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 104.1) x 45.1 = 43%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A985		Admiralty Road Roundabout	0.4	0.08
SALT	M90	North	J1C Admiralty on slip	0.4	0.07
SALT	A823(M)	West	M90 to B980 roundabout	1.8	0.33
Turn	B980		B980 Roundabout	0.4	
SALT	A823(M)	East	B980 roundabout to M90 northbound	1.8	0.33
Travel	M90	North	J2 to J2A	3.2	
SALT	M90	East	J2A off slip	2.1	0.34
Travel	A92	East	M90 J2A to Cowdenbeath Interchange	3	
Turn	A92		Cowdenbeath Interchange	1	
Travel	A92	West	Cowdenbeath Interchange to M90 J2A	2.8	
SALT	M90	South	J2A on slip	1.8	0.29
Travel	M90	South	J2a to J2	3.3	
SALT	A823(M)	West	M90 to B980 roundabout	2.1	0.34
Turn	B980		B980 Roundabout	0.4	
SALT	A823(M)	East	B980 roundabout to M90 southbound	2	0.32
SALT	M90	South	J2 Masterton to J1C Admiralty	0.6	0.1
SALT	M90	South	J1C Admiralty off slip	0.3	0.05
SALT	M90	South	J1C Admiralty on slip	0.3	0.05
Travel	M90	South	J1C Admiralty to J1B Ferrytoll	1	
SALT	M90	South	J1B Ferrytoll off slip	0.3	0.05
Salt	M90		Ferrytoll Roundabout	0.65	0.10
Salt	A9000	South	Start on slip to FRB to end on slip ONLY	0.7	0.11
Travel	A9000	South	Forth rod bridge to off slip to Echline rbt	2.7	
Salt	A9000	East	Dedicated bus lane to A90	2.2	0.26
Travel	A90	East	End of dedicated bus lane to Burnshot Junction	3.3	
Turn	A90		Burnshot junction	0.7	
Travel	A90	West	Burnshot junction to start of dedicated bus lane	3.5	
Salt	A90	West	Dedicated bus lane to B800	0.8	0.08
Travel	B800	North	End of dedicated bus lane to A904 Ferrymuir Roundabout	1.2	
Salt	A9000	North	On slip from Echline Roundabout ONLY	0.5	0.07
Travel	A9000	North	End of on slip from Echline RBT to Off slip to J1B Ferry toll	2.7	
Salt	A9000	North	Start J1B off slip to Ferry Toll RBT	0.75	0.12
SALT	M90	North	J1B Ferrytoll on slip	0.5	0.08
Travel	M90	North	J1B Ferrytoll to J1C Admiralty		
SALT	M90	North	J1C Admiralty off slip	0.3	0.05
SALT	A985	West	Admiralty Road Roundabout to Queensferry Road Roundabout	0.5	0.1
SALT			Queensferry Road Roundabout	0.1	0.02
SALT	A985	West	Queensferry Road Roundabout to Kings Road Roundabout	0.8	0.16
SALT	A985		Kings Road Roundabout	0.1	0.02

SALT	A985	West	Kings Road Roundabout to Brankholm Brae Roundabout	0.7	0.14
SALT	A985		Brankholm Brae Roundabout	0.2	0.03
SALT	A985	West	Brankholm Brae Roundabout to Cairneyhill Roundabout	8	1.28
SALT	A985		Cairneyhill Roundabout	0.3	0.06
SALT	A985	West	Cairneyhill Roundabout to Longannet Roundabout	9.9	1.59
SALT	A985		Longannet Roundabout	0.2	0.04
SALT	A977	West	Longannet Roundabout to A977 Kilbagie Roundabout	4.3	0.86
SALT	A977		Kilbagie Roundabout	0.1	0.02
SALT	A977	West	Kilbagie Roundabout to Gartarry Roundabout	0.3	0.06
			Totals	**88.3**	**8.32**

Depot:	Rosyth	**Route:**	**SE20R15 A**
Spread Rate:	Up to 0.0156 l/m²	**Route Length:**	52.65 km
Treatment Type:	Potassium Acetate	**Route Treated Length:**	17.15 km
Depot to Route:	3.6 km	**Route Time:**	49 mins
Depot to Route:	3.6 mins	**Route Coverage:**	1950 litres
Route to Depot:	2.3 km	**Route Average Width:**	7.3 m
Route to Depot:	2.3 mins	**Route Average Speed:**	56 km/h



A = 3.6 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 52.65 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 17.15 km – Total Distance treated from 2. start of route to 3. end of route (km)

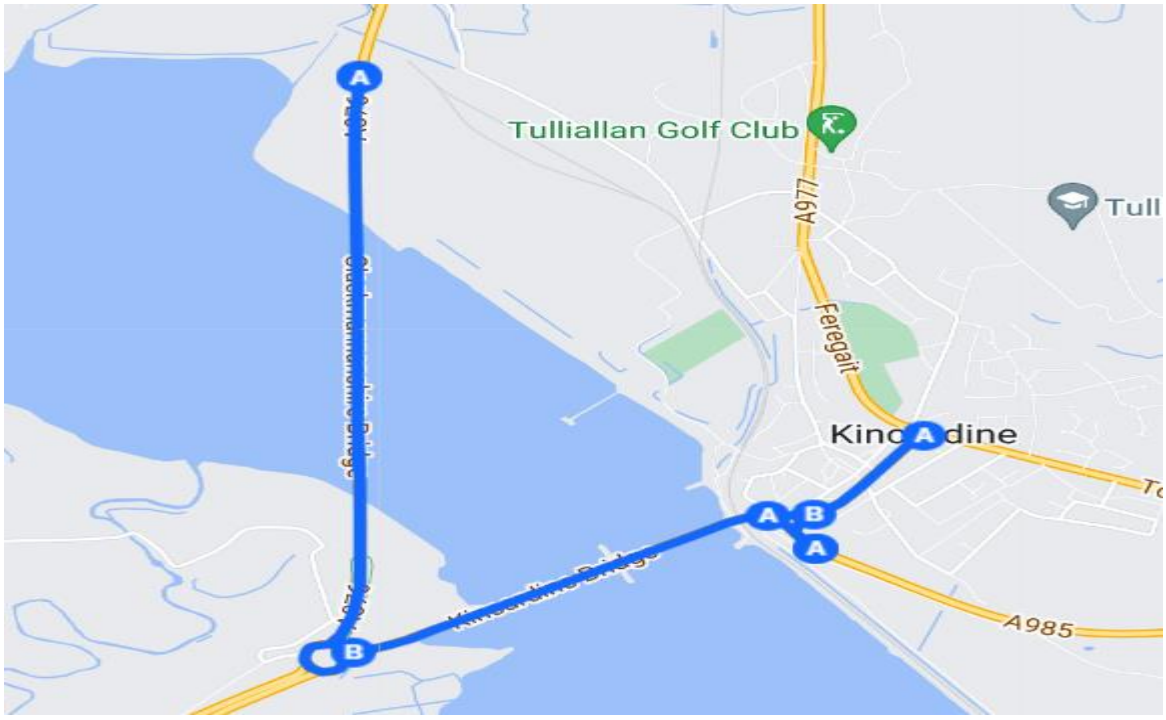
D = 2.3km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 58.55) x 17.15 = 29.29%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Volume (litres)
Travel	M90	South	J1C Admiralty on slip	0.3	
Travel	M90	South	J1C Admiralty to mid-point J1B Ferrytoll	1.3	
SPRAY	M90	South	Mid-point J1B Ferrytoll to mid-point J1A (Queensferry Crossing)	4.3	489
Travel	A90	East	Mid-point J1A to Burnshot Junction	6.1	
Turn	A90		Burnshot Junction	0.7	
Travel	A90	West	Burnshot Junction to mid-point J1A	6.2	
SPRAY	M90	North	Mid-point J1A to J1B (Queensferry Crossing)	4.3	489
Travel	M90	North	J1B Ferrytoll to J1C Admiralty	1.3	
Turn	M90		J1C Admiralty	0.9	
Travel	M90	South	J1C Admiralty to J1B Ferrytoll	1	
Travel	M90	South	J1B Ferrytoll off slip	0.4	
SPRAY	M90	South	J1B Ferrytoll on slip to M90	0.5	57
Travel	M90	South	Queensferry Crossing	3.3	
SPRAY	M90	South	J1A A904 Queensferry off slip	0.5	57
Turn	A940		Queensferry Roundabout	0.3	
SPRAY	M90	North	J1A A904 Queensferry on slip	0.5	57
Travel	M90	North	Queensfery Crossing	3.3	
SPRAY	M90	North	J1B Ferrytoll off slip	0.4	45
Turn	A90		J1B Ferry Toll Roundabout	0.4	
SPRAY	A9000	South	End of on slip to FRB to end of off slip Echline RBT (Forth Road Bridge)	3.45	392
SPRAY	A9000	East	On slip from Echline RBT to End of on slip.	0.3	34
Travel	A90	East	End of dedicated bus lane to Burnshot Junction	3.3	
Turn	A90		Burnshot junction	0.7	
Travel	A90	West	Burnshot junction to start of dedicated bus lane	3.5	
Travel	A90	West	Dedicated bus lane to B800	0.8	
Travel	B800	North	End of dedicated bus lane to A904 Ferrymuir Roundabout	1.2	
Travel	A9000	North	On slip from Echline Roundabout to FRB	0.5	
SPRAY	A9000	North	End of on slip from Echline to Start J1B off slip Ferry Toll (Forth Road Bridge)	2.9	330
				17.15	1950

Depot:	Rosyth	**Route:**	**SE20R15 B**
Spread Rate:	Up to 0.0156 l/m²	**Route Length:**	15.2 km
Treatment Type:	Potassium Acetate	**Route Treated Length:**	7.4 km
Depot to Route:	20.7 km	**Route Time:**	15 mins
Depot to Route:	19.5 mins	**Route Coverage:**	841 litres
Route to Depot:	20.7 km	**Route Average Width:**	7.3 m
Route to Depot:	19.5 mins	**Route Average Speed:**	56 km/h



A = 20.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 15.2 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 7.4 km – Total Distance treated from 2. start of route to 3. end of route (km)

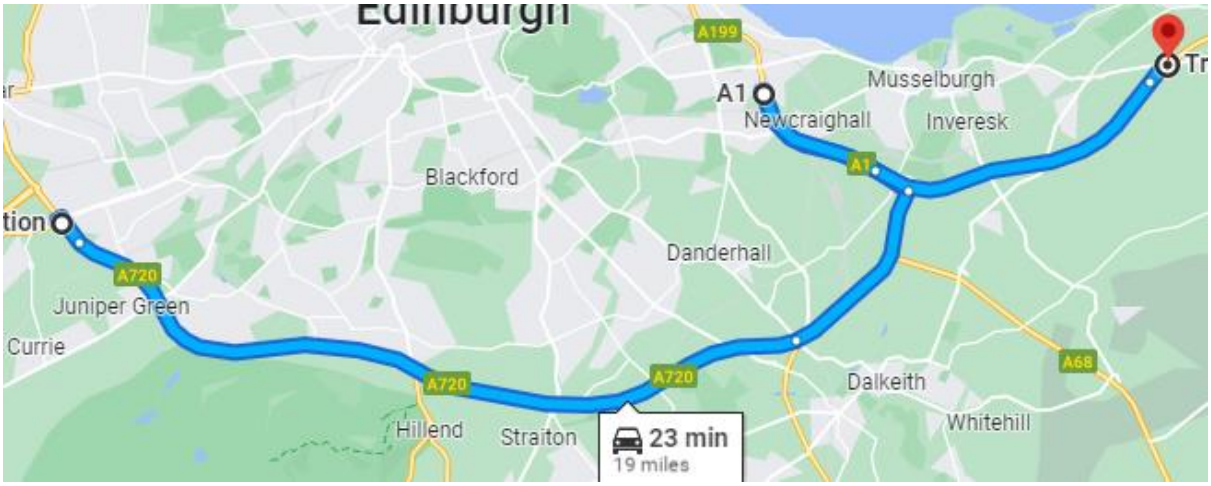
D = 20.7 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 /56.6) x 7.4 = 13.07%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Volume (litres)
SPRAY	A876	South	North Approach Road - TL to A985	0.5	57
SPRAY	A985	East	North Approach Road to 400yrd lane narrow sign.	0.2	23
Turn	A985		400yrd lane narrow sign to Longannet Roundabout	1.2	
Travel	A985		Longannet Roundabout to 200m prior to Kincardine bridge.	1.2	
SPRAY	A985	West	200m prior to Kincardine bridge.to Higgins Neuk Roundabout (Kincardine Bridge)	1.3	148
SPRAY	A876		Higgins Neuk Roundabout	0.3	34
SPRAY	A876	North	Higgins Neuk Roundabout to 200m after Clackmannanshire Bridge	1.9	216
Travel	A867	North	200m after Clackmannanshire Bridge to Kilbagie Roundabout	2.4	
Turn	A985		Kilbagie Roundabout	0.3	
Travel	A867	South	Kilbagie Roundabout to 200m prior to Clackmannanshire Bridge	2.4	
SPRAY	A876	South	200m prior to Clackmannanshire Bridge A876 Higgins Neuk Roundabout (Clackmannanshire Bridge)	1.7	193
Turn Left	A985		Higgins Neuk Roundabout	0.3	
SPRAY	A985	East	Higgins Neuk Roundabout to North Approach Road (Kincardine Bridge)	1	113
SPRAY	A876	North	North Approach Road	0.5	57
				7.4	841

Depot:	Bonnyrigg	**Route:**	**SE20R016**
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	67.55km
Depot to Route:	6.3km	**Route Time:**	83 min
Depot to Route:	5.5min	**Route Coverage:**	10.97t
Route to Depot:	6.3km	**Route Average Width:**	8.6m
Route to Depot:	5.5min	**Route Average Speed:**	68 km/h



A = 6.3 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 94.21km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 67.55 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 6.3 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 /106.81) x 67.55 = 63.24%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Eyemouth depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
Salt	A720	East	Sheriffhall Rbt to Old Craighall Rbt	3.5	0.602
Salt	A1	North	Old Craighall Rbt to New Craighall	3.4	0.584
Salt	A1	South	New Craighall to Tranent off slip	8.7	1.49
Travel	A1		Tranent Off Slip to Tranent on slip	0.21	
Salt	A1	North	Tranent on slip To End of on slip from Craighall rbt	6.2	1.06
Travel	A1	South	End of on slip from Craighall rbt To Off slip to Old Craighall rbt	5.6	
Salt	A1	South	Off slip to Old Craighall rbt To End of on slip s/b	1	0.17
Travel	A1	South	End of on slip s/b To Wallyford off slip	1.3	
Salt	A1	South	Wallyford off slip To End of Wallyford off slip	0.65	0.11
Travel	A1		End of Wallyford off slip To Start Wallyford on slip N/B	0.1	
Salt	A1	North	Start Wallyford on slip N/B To End of Wallyford on slip	0.65	0.11
Travel	A1	North	End of Wallyford on slip To Start of off slip to Old Craigehall	1.2	
Salt	A1	North	Start of off slip to Old Craigehall to End of off slip	0.6	0.1
Salt	A1		Old Craighall RBT	0.4	0.06
Salt	A720	West	Old Craighall RBT to Sheriffhall rbt	3.5	0.6
Salt	A720		Sherriffhall Rbt inner and outer lanes	0.5	0.08
Salt	A720	West	Sheriffhall rbt To End of off slip Calder	14.6	2.51
Salt	A720	East	Start of on slip Calder to End of Gilmerton off slip	13.3	2.28
Travel	A720		End of Gilmerton off slip To Start of on slip Gilmerton	0.27	
Salt	A720	West	Gilmerton on slip	0.6	0.1
Travel	A720		Gilmerton on slip To Straiton off slip	2.3	
Salt	A720	West	Start Straiton off slip To End Straiton on slip	1	0.17
Travel	A720	West	End Straiton on slip To Start Hillend off slip	1.5	
Salt	A720	West	Start Hillend off slip To End of Hillend on slip	0.95	0.163
Travel	A720	West	End of Hillend on slip To Dreghorn off slip	0.8	
Salt	A720	West	Dreghorn off slip To End of Dreghorn on slip	0.75	0.12
Travel	A720	West	End of Dreghorn on slip To Start Baberton off slip	2.8	
Salt	A720	West	Start Baberton off slip To End of Baberton Off slip	0.4	0.06
Travel	A720		End of Baberton Off slip To Start of on slip Baberton on slip	0.28	
Salt	A720	East	Start of on slip Baberton on slip To End of on slip	0.6	0.06
Travel	A720	East	End of Barberton on slip To Dreghorn off slip	3	
Salt	A720	East	Dreghorn off slip To End of Drehhorn On slip	0.8	0.13
Travel	A720	East	end of Drehhorn On slip To Start of Hillend off slip	0.6	

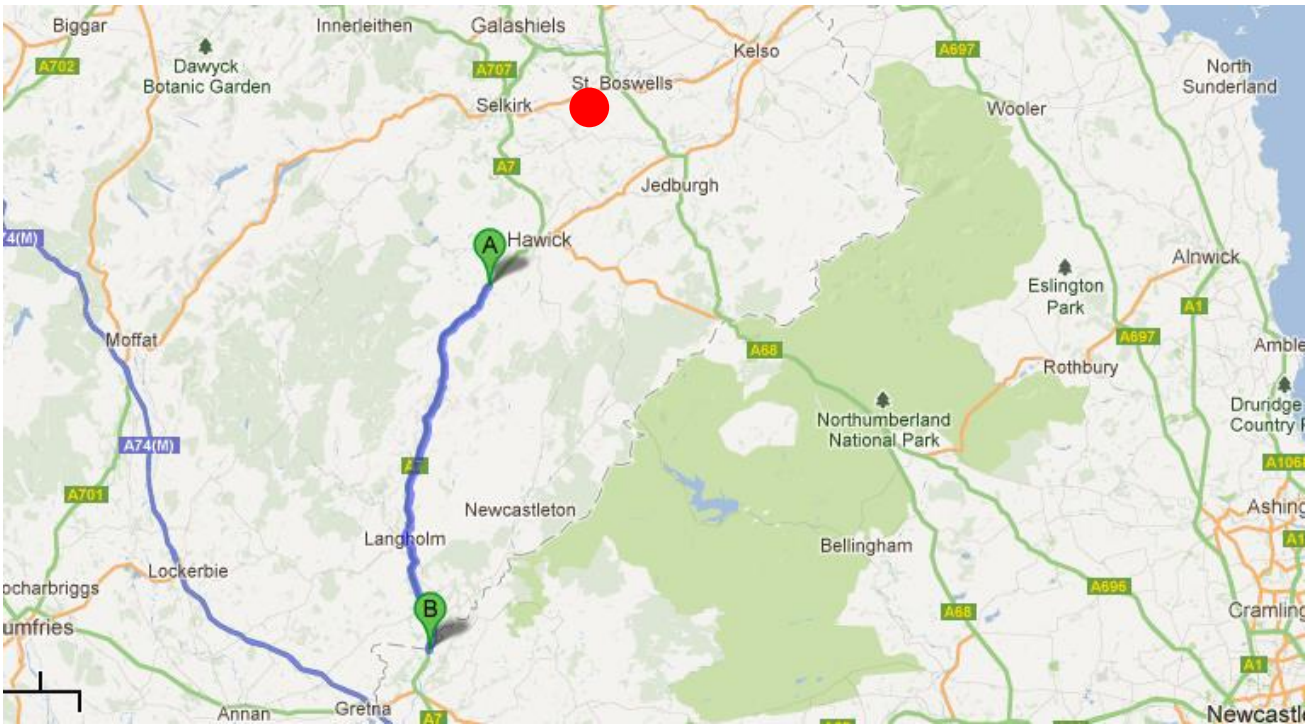
Salt	A720	East	Start of Hillend off slip To End of Hillend on slip	1.3	0.22
Travel	A720	East	End of Hillend on slip To Start of Off slip Straiton	1.6	
Salt	A720	East	Start of Off slip Straiton to End of on slip Straiton	1.2	0.2
Travel	A720	East	End of on slip Straiton to Start of Lasswade off slip	0.6	
Salt	A720	East	Start of Lasswade off slip To End of Lasswade slip	0.5	0.08
Travel	A720		End of Lasswade slip To Start of Lasswade on slip	0.1	
Salt	A720	West	Start of Lasswade on slip To End of Lasswade on slip	0.75	0.12
Travel	A720	West	End of Lasswade on slip To End of Stration Off slip	1.1	
Travel	A720	East	End of Stration Off slip To Start of Gilmerton off slip	3.3	
Salt	A720	East	Start of Gilmerton off slip To Sheriffhall rbt	1.7	0.29
				94.21	10.979

Summary of 40 g/m^2 Treatment Routes

Route No.	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @20g/m^2 (tonne)	Route Tonnage @40g/m^2 (tonne)	Treatment type
SE40R01	Charlesfield	A7 as per route card	33	33	42.9	42.9	48	54	90.1	25%	7.3	As per route card		12.51	Pre-wet salt
SE40R02	Charlesfield	A7 and A6091 as per route card	5.1	5.1	41.8	41.8	48	52.2	33	52%	7.5	As per route card		12.47	Pre-wet salt
SE40R03	Charlesfield	A68 as per route card	14	14	76.9	44.9	56	82.4	6.4	46%	7.4	As per route card		13.35	Pre-wet salt
SE40R04	Eyemouth	A1 as per route card	7.3	7.37	107.7	38.3	63	102.5	9.4	29%	8.7	As per route card		13.49	Pre-wet salt
SE40R05	Eyemouth	A1 as per route card	11.6	11.6	85.8	36.3	63	81.2	24.5	30%	8.9	As per route card		12.99	Pre-wet salt
SE40R06	Charlesfield	A68 as per route card	20.1	18.3	44.2	39.7	56	48	44.5	35%	8.4	As per route card		13.34	Pre-wet salt
SE40R07	Bonnyrigg	A702 as per route card	19	19	51.8	51.8	48	65	69.9	37%	7.2	As per route card		14.98	Pre-wet salt
SE40R08	Bonnyrigg	A1 as per route card	6.4	6.4	79.4	10.1	68	70.4	7.8	40%	9	As per route card		14.11	Pre-wet salt
SE40R09	Bonnyrigg	A1 as per route card	8	8	79.4	39.8	68	70.4	6.4	40%	9	As per route card		14.05	Pre-wet salt
SE40R10	Rosyth	A720 as per route card	16.7	12	60.1	31.4	67	54	29	32%	9.7	As per route card		12.37	Pre-wet salt
SE40R11	Bonnyrigg	A720 as per route card	6.4	6.4	59.5	34.9	65	54	6.4	48%	9.7	As per route card		13.43	Pre-wet salt
SE40R12	Burghmuir	M8 and M9 as per route card	17.7	17.7	74.1	37.7	68	65.4	11.4	37%	10.1	As per route card		15.29	Pre-wet salt
SE40R13	Burghmuir	M8 and M9 as per route card	12.7	12.7	77.1	36.8	68	68	17.4	34%	10.2	As per route card		14.97	Pre-wet salt

Route No.	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @20g/m^2 (tonne)	Route Tonnage @40g/m^2 (tonne)	Treatment type
SE40R14	Burghmuir	M8 and M9 as per route card	0.7	0.7	79	33.3	68	69.7	0.6	41%	10.3	As per route card		13.82	Pre-wet salt
SE40R15	Burghmuir	M9 as per route card	10.3	10.3	74.3	36.3	68	65.6	16.0	36%	10.3	As per route card		15.01	Pre-wet salt
SE40R16	Burghmuir	M9 as per route card	9.4	9.4	66.3	34.8	68	58.5	13.4	39%	10.3	As per route card		14.36	Pre-wet salt
SE40R17	Chryston	M80 and M876 as per route card	15	15	71.2	31.2	68	62.8	15	31%	10.4	As per route card		13.01	Pre-wet salt
SE40R18	Chryston	M80 and M876 as per route card	15	15	71.4	31.7	68	63	15	31%	10.3	As per route card		13.05	Pre-wet salt
SE40R19	Lochgelly	A90, M9 and M90 as per route card	11.5	11.5	108.1	35.8	64	101.4	13.9	26%	9.1	As per route card		13.09	Pre-wet salt
SE40R20	Rosyth	A90, M9 and M90 as per route card	1.8	1.8	98.35	33.75	64	92.25	11.7	33.75%	10.0	As per route card		13.62	Pre-wet salt
SE40R21	Lochgelly	A977, A985 and M823 as per route card	10.2	11	69.5	46.6	56	69	41	48%	8.0	As per route card		14.91	Pre-wet salt
SE40R22 A	Rosyth	Queensferry Crossing, Forth Road Bridge, , as per route card	3.6	3.6	52.65	17.15	56	49	2.3	29.29%	7.3	As per route card	(31.2 ml/ m2)	3900 litres	Potassium Acetate
SE40R22 B	Rosyth	Kincardine Bridge and Clackmannanshire Bridge, as per route card	20.7	19.5	15.2	7.4	56	15	20.7	13.07	7.3	As per route card	(31.2ml/ m2)	1682 litres	Potassium Acetate

Depot:	Charlesfield	Route:	**SE40R01**
Spread Rate:	Up to 40g/m²	Route Length:	42.9 km
Treatment Type:	Pre-wetted salt	Route Treated Length:	42.9 km
Depot to Route:	33.0 km	Route Time:	54.0 mins
Depot to Route:	33.0 mins	Route Coverage:	12.51 tonnes
Route to Depot:	90.1 km	Route Average Width:	7.3 m
Route to Depot:	90.1 mins	Route Average Speed:	48 km/h



A = 33.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 42.9 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 42.9 km – Total Distance treated from 2. start of route to 3. end of route (km)

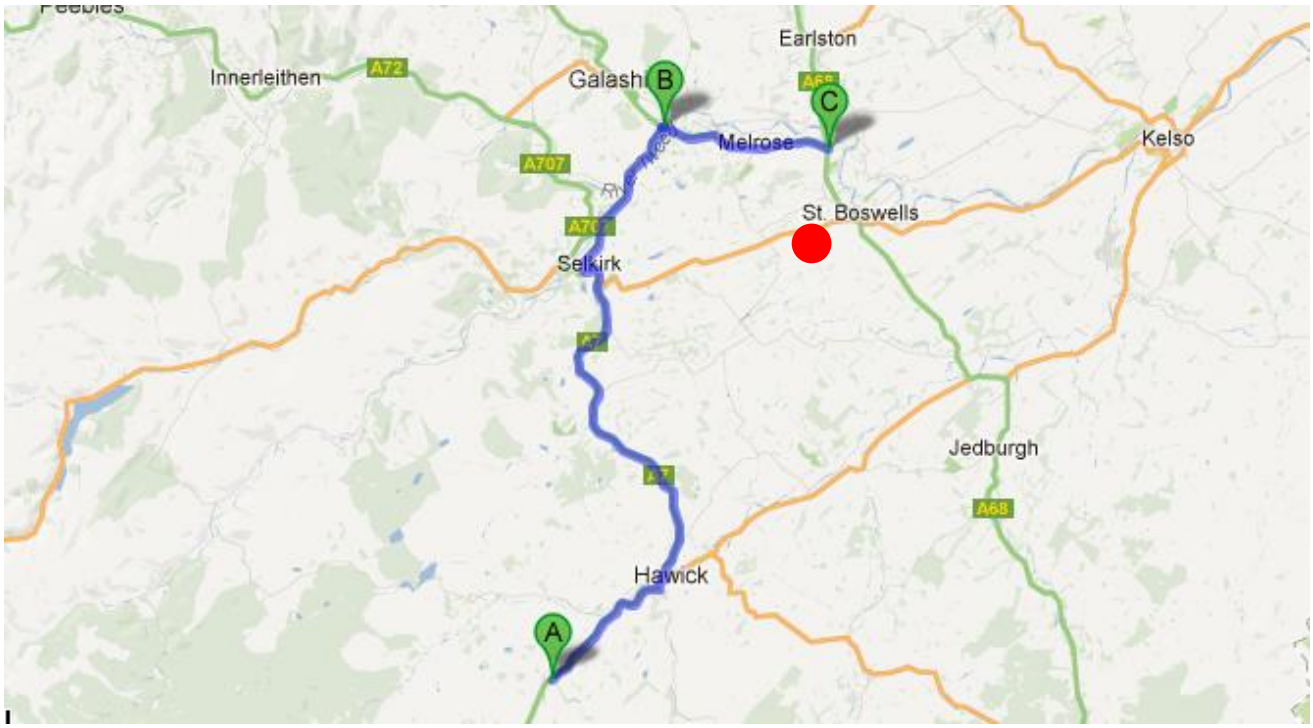
D = 90.1 km – Distance from 3. end of route to 1. Depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 166.0) x 42.9 = 25%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A7	South	Newmill to start of 30mph zone at Langholm	29.7	8.68
SALT	A7	South	Start of 30mph zone to end of 30mph zone at Langholm	2	0.57
SALT	A7	South	End of 30mph zone at Langholm to national boundary	11.2	3.26
			Totals	**42.9**	**12.51**

Depot:	Charlesfield	Route:	**SE40R02**
Spread Rate:	Up to 40g/m²	Route Length:	41.8 km
Treatment Type:	Pre-wetted salt	Route Treated Length:	41.8 km
Depot to Route:	5.1 km	Route Time:	52.2 mins
Depot to Route:	5.1 mins	Route Coverage:	12.47 tonnes
Route to Depot:	33.0 km	Route Average Width:	7.5 m
Route to Depot:	33.0 mins	Route Average Speed:	48 km/h



A = 5.1 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 41.8 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 41.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

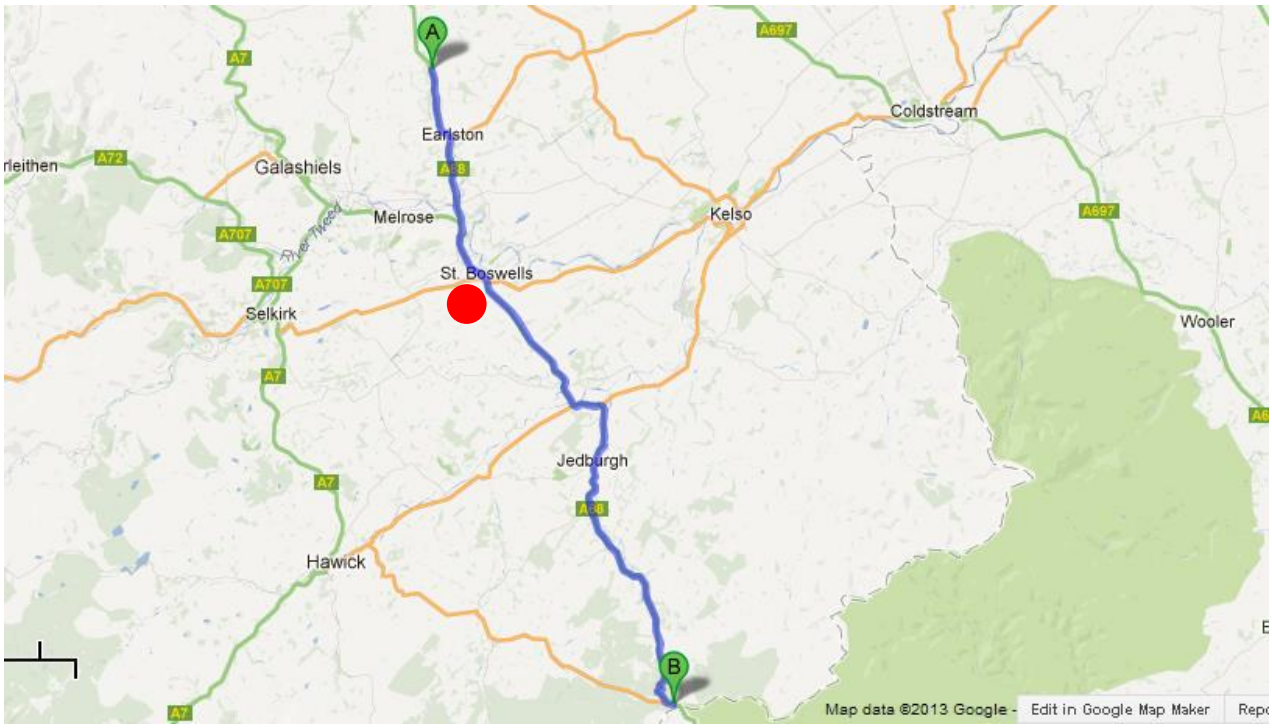
D = 33.0 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 79.9) x 41.8 = 52%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A6091	East	Ravenswood Roundabout to Melrose Roundabout	5.3	1.55
SALT	A6091		Melrose Roundabout	0.3	0.09
SALT	A6091	East	Melrose Roundabout to Tweedbank Roundabout	1.3	0.51
SALT	A6091		Tweedbank Roundabout	0.3	0.09
SALT	A6091	East	Tweedbank Roundabout to Kingsknowe Roundabout	1	0.4
SALT	A7		Kingsknowe Roundabout	0.2	0.07
SALT	A7	North	Kingsknowe Roundabout to Start of 30mph zone, Selkirk	6.5	1.91
SALT	A7	North	Start of 30mph zone, Selkirk to end of 30mph zone, Selkirk	2.6	0.76
SALT	A7	North	End of 30mph zone, Selkirk to Galalaw Roundabout	14.5	4.23
SALT	A7	North	Galalaw Roundabout	0.1	0.04
SALT	A7	North	Galalaw Roundabout to Dovemont Place Roundabout	1.7	0.5
SALT	A7	North	Dovemont Place Roundabout	0.1	0.03
SALT	A7	North	Dovemont Place Roundabout to Sandbed Roundabout	0.9	0.26
SALT	A7	North	Sandbed Roundabout	0.1	0.02
SALT	A7	North	Sandbed Roundabout to End of 30mph zone, Hawick	1.1	0.31
SALT	A7	North	End of 30mph zone, Hawick to Newmills junction	5.8	1.7
			Totals	**41.8**	**12.47**

Depot:	Charlesfield	Route:	**SE40R03**
Spread Rate:	Up to 40g/m²	Route Length:	76.9 km
Treatment Type:	Pre-wetted salt	Route Treated Length:	44.9 km
Depot to Route:	14.0 km	Route Time:	82.4 mins
Depot to Route:	14.0 mins	Route Coverage:	13.35 tonnes
Route to Depot:	6.4 km	Route Average Width:	7.4 m
Route to Depot:	6.4 mins	Route Average Speed:	56 km/h



A = 14.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 76.9 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 44.9 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 6.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 97.3) x 44.9 = 46%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A68	South	Birkenside junction to start of 30mph zone, Earlston	4.3	1.25
SALT	A68	South	Start of 30mph zone to end of 30mph zone, Earlston	1.3	0.38
SALT	A68	South	End of 30mph zone, Earlston to Ravenswood Roundabout	3.5	1.36
SALT	A68	South	Ravenswood Roundabout	0.2	0.05
SALT	A68	South	Ravenswood Roundabout to Jedburgh	16.6	4.85
SALT	A68	South	Start of 30mph zone to end of 30mph zone, Jedburgh	2.2	0.63
SALT	A68	South	End of 30mph zone, Jedburgh to national boundary	15.9	4.65
Turn			National boundary	0.2	
Travel	A68	North	National boundary to A698 junction	21.9	
SALT	A68	North	A698 junction	0.3	0.06
Travel	A68	North	A698 junction to Newtown St Boswells south junction	8.9	
SALT	A68	North	Newtown St Boswells south junction	0.3	0.06
Travel	A68	North	Newtown St Boswells south junction to Newtown St Boswells north junction	1	
SALT	A68	North	Newtown St Boswells north junction	0.3	0.06
			Totals	**76.9**	**13.35**

Depot:	Eyemouth	**Route:**	**SE40R04**
Spread Rate:	Up to 40g/m²	**Route Length:**	107.7 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	38.3 km
Depot to Route:	7.3 km	**Route Time:**	102.5 mins
Depot to Route:	7.3 min	**Route Coverage:**	13.49 tonnes
Route to Depot:	9.4 km	**Route Average Width:**	8.7 m
Route to Depot:	9.4 mins	**Route Average Speed:**	63 km/h

A = 7.3 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 107.7 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 38.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 9.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 177.5) x 38.3 = 28.5%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage
SALT	A1	South	Start of dual carriageway at Lamberton to National Boundary	1.4	0.52
Travel	A1	South	National Boundary to Berwick Upon Tweed	2.9	
Turn	A1		Berwick Upon Tweed Roundabout	0.3	
Travel	A1	North	Berwick Upon Tweed to National Boundary	2.9	
Travel	A1	North	National Boundary to end of dual carriageway at Lamberton	1.4	
Travel	A1	North	End of dual carriageway at Lamberton to start of dual carriageway at Lemington	12.1	
Travel	A1	North	Start of dual carriageway at Lemington to end of dual carriageway at Houndwood	3.7	
SALT	A1	North	End of dual carriageway at Hound wood to start of dual carriageway at Penmanshiels	6.2	1.81
Travel	A1	North	Start of dual carriageway at Penmanshiels to end of dual carriageway at Penmanshiels	2.7	
SALT	A1	North	End of dual carriageway at Penmanshiels to Cockburnspath Roundabout	2.5	1.3
SALT	A1	North	Cockburnspath Roundabout to start of dual carriageway at Torness	4.1	1.2
SALT	A1	North	Cross over at dual carriageway at Torness	0.2	0.03
SALT	A1	North	End of dual carriageway at Torness to start of dual carriageway at Thurston Manor	2.1	0.61
Travel	A1	North	Start of dual carridgeway at Thurston Manor to Haddington Jct	21.8	
Turn	A1		Haddington Jct	0.2	
Travel	A1	South	Haddington Jct to Tyne Bridge	6.9	
SALT	A1	South	Tyne Bridge to Thistly Cross Roundabout	7	2.61
SALT	A1	South	Thistly Cross Roundabout to Spott Roundabout	3	1.12
SALT	A1	South	Spott Roundabout to end of dual carriageway at Thurston Manor	4.8	1.79
Travel	A1	South	End of dual carriagway at Thurston Manor to start of dual carriagway at Torness	1.9	
SALT	A1	South	Start of dual carriageway at Torness to end of dual carriageway at Torness	0.6	0.12

Travel	A1	South	End of dual carriageway at Torness to Cockburnspath Roundabout	3.9	
Travel	A1	South	Cockburnspath Roundabout to start of dual carriageway at Penmanshiels	2.5	
SALT	A1	South	Start of dual carriageway at Penmanshiels to end of dual carriageway at Penmanshiels	2.7	1
Travel	A1	South	End of dual carriageway at Penmanshiels to start of dual carriageway at Houndwood	6.2	
SALT	A1	South	Start of dual carriageway at Houndwood to end of dual carriageway at Lemington	3.7	1.38
				107.7	**13.49**

Depot:	Bonnyrigg	**Route:**	**SE40R05**
Spread Rate:	Up to 40g/m²	**Route Length:**	85.8 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	36.3 km
Depot to Route:	11.6 km	**Route Time:**	81.2 mins
Depot to Route:	11.6 mins	**Route Coverage:**	12.99 tonnes
Route to Depot:	24.5 km	**Route Average Width:**	8.9 m
Route to Depot:	24.5 mins	**Route Average Speed:**	63 km/h

A = 11.6 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 85.8 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 36.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 24.5 km – Distance from 3. end of route to 1. depot

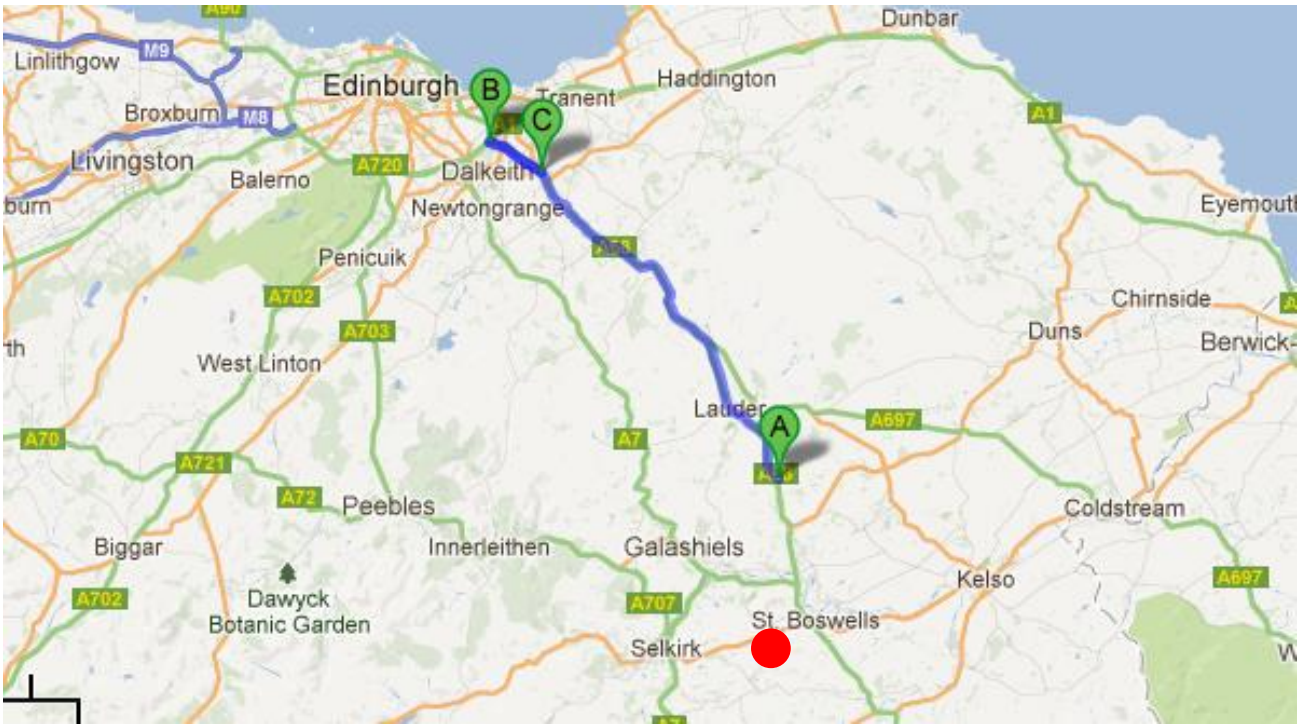
E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 178.1) x 36.3 = 30%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage
SALT	A1	North	National Boundary to end of dual carriageway at Lamberton	1.4	0.52
SALT	A1	South	End of dual carriageway at Lamberton to start of dual carriageway at Lemington	12.1	4.5
SALT	A1	North	Start of dual carriageway at Lemington to end of dual carriageway at Houndwood	3.7	1.08
Travel	A1	North	End of dual carriageway at Houndwood to start of dual carriageway at Penmanshiels	6.2	
SALT	A1	North	Start of dual carriageway at Penmanshiels to end of dual carriageway at Penmanshiels	2.7	1
Travel	A1	North	End of dual carriageway at Penmanshiels to Cockburnspath Roundabout	2.5	
Travel	A1	North	Cockburnspath Roundabout start of dual carriageway at Torness	4.2	
SALT	A1	North	Start of dual carriageway at Torness to end of dual carriageway at Torness	0.6	0.13
Travel	A1	North	End of dual carriageway at Torness to start of dual carriageway at Thurston Manor	1.9	
SALT	A1	North	Start of dual carriageway at Thurston Manor to Spott Roundabout	4.8	1.79
SALT	A1	North	Spott Roundabout to Thistly Cross Roundabout	3	1.12
SALT	A1	North	Thistly Cross Roundabout to Tyne Bridge	7	2.61
Travel	A1	North	Tyne Bridge to Haddington Jct	6.9	
Turn	A199		Haddington Jct	0.2	
Travel	A1	South	Haddington Jct to Thistly cross Roundabout	13.8	
SALT	A1		Thistly Cross Roundabout	0.2	0.06
Travel	A1	South	Thistly Cross Roundabout to Spott Roundabout	3	
SALT	A1		Spott Roundabout	0.2	0.06
Travel	A1	South	Spott Roundabout to end of dual carriageway at Thurston Manor access	4.8	
Travel	A1	South	End of dual carriageway at Thurston Manor to start of dual carriageway at Torness	2	
SALT	A1	South	Torness access deceleration lane	0.2	0.03
SALT	A1	South	Torness access acceleration lane	0.2	0.03

Travel	A1	South	End of dual carriageway at Torness to Cockburnspath Roundabout	4	
SALT	A1		Cockburnspath Roundabout	0.2	0.06
				85.9	**12.99**

Depot:	Charlesfield	Route:	**SE40R06**
Spread Rate:	Up to 40g/m²	Route Length:	44.2 km
Treatment Type:	Pre-wetted salt	Route Treated Length:	39.7 km
Depot to Route:	20.1 km	Route Time:	48 mins
Depot to Route:	18.3 mins	Route Coverage:	13.34 tonnes
Route to Depot:	47.6 km	Route Average Width:	8.4 m
Route to Depot:	44.5 mins	Route Average Speed:	56 km/h



A = 20.1 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 42.7 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 39.7 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 47.6 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 93.3) x 39.7 = 35%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A68	North	Birkenside junction to Lauder	5.9	1.73
SALT	A68	North	Start of 30mph zone to end of 30mph zone, Lauder	1.5	0.43
SALT	A68	North	Lauder to Carfraemill Roundabout	5.8	1.68
SALT	A68	North	Carfraemill Roundabout	0.2	0.04
SALT	A68	North	Carfraemill Roundabout to end of three lane section at Soutra	3	0.87
SALT	A68	North	Start of three lane section to end of three lane section at Soutra	6.3	2.75
SALT	A68	North	End of three lane section at Soutra to Pathhead	8	2.34
SALT	A68	North	Start of 30mph zone to end of 30mph zone, Pathhead	0.9	0.25
SALT	A68	North	Pathhead to start of Dalkeith Bypass to	2.1	0.86
SALT	A68	North	Start of Dalkeith Bypass to end of Dalkeith Bypass	3.6	1.58
SALT	A68	North	End of Dalkeith Bypass South roundabout at Millerhill Interchange	1.5	0.57
SALT	A68	North	South roundabout at Millerhill Interchange	0.1	0.04
SALT	A68	North	south roundabout at Millerhill Interchange to North roundabout	0.1	0.02
SALT	A68		North roundabout at Millerhill Interchange	0.1	0.04
Travel	A68	South	Millerhill Interchange to Salters Road Junction	1.5	
SALT	A68	South	Salters Road junction	0.3	0.07
Travel	A68	South	Salters Road junction to Fordel junction	3	
SALT	A68	South	Fordel junction	0.3	0.07
			Totals	**44.2**	**13.34**

Depot:	Bonnyrigg	**Route:**	**SE40R07**
Spread Rate:	Up to 40g/m²	**Route Length:**	51.8 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	51.8 km
Depot to Route:	19.0 km	**Route Time:**	65.0 mins
Depot to Route:	19 mins	**Route Coverage:**	14.98 tonnes
Route to Depot:	69.9 km	**Route Average Width:**	7.2 m
Route to Depot:	69.9 mins	**Route Average Speed:**	48 km/h

A = 19.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 51.8km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 51.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 69.9 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 140.7) x 51.8 = 37%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A702	South	Mauricewood Roundabout to Carlops	9.2	2.58
SALT	A702	South	Carlops	0.9	0.26
SALT	A702	South	Carlops to West Linton	3.2	0.93
SALT	A702	South	Robins Land Roundabout	0.1	0.02
SALT	A702	South	West Linton	0.7	0.2
SALT	A702	South	West Linton to Melbourne junction	10	2.82
SALT	A702	South	Melbourne junction to Biggar	7.1	2.08
SALT	A702	South	Biggar	2.8	0.82
SALT	A702	South	Biggar to Coulter	3	0.88
SALT	A702	South	Coulter to Maidencots Roundabout	12.2	3.55
SALT	A702		Maidencots Roundabout	0.1	0.03
SALT	A702	South	Maidencots Roundabout to start of dual carriageway	1.4	0.41
SALT	A702	South	Start of dual carriageway to southbound roundabout at Abington interchange	0.2	0.07
SALT	A702		Southbound roundabout at Abington interchange	0.2	0.06
SALT	A702	South	Southbound roundabout to northbound roundabout at Abington interchange	0.2	0.08
SALT	A702		Northbound roundabout at Abington interchange	0.1	0.04
SALT	A702	North	Northbound roundabout to sourthbound roundabout at Abington interchange	0.2	0.08
SALT	A702	North	Southbound roundabout at Abington interchange to end of dual carriageway	0.2	0.07
			Totals	**51.8**	**14.98**

Depot:	Bonnyrigg	**Route:**	**SE40R08**
Spread Rate:	Up to 40g/m²	**Route Length:**	79.4 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	40.1 km
Depot to Route:	6.4 km	**Route Time:**	79.4 mins
Depot to Route:	6.4 mins	**Route Coverage:**	14.11 tonnes
Route to Depot:	7.8 km	**Route Average Width:**	9.0 m
Route to Depot:	7.8 mins	**Route Average Speed:**	68 km/h

A = 6.4 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 77.5 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 37.1 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 7.8 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 91.7) x 37.1 = 40%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A720	East	Sheriffhall Roundabout to Old Craighall Interchange	3.6	1.34
SALT	A1	West	Old Craighall Interchange on slip	0.5	0.15
Travel	A1	West	Old Craighall Interchange to Newcraighall Roundabout	1.9	
Turn Around	A1		Newcraighall Roundabout	0.3	
SALT	A1	East	Newcraighall Roundabout to Tynebridge	29.4	10.62
Travel	A1	East	Tyne Bridge to Thistycross Roundabout	7.0	
Turn	A1		Thistlycross Roundabout	0.2	
Travel	A1	West	Thistlycross Roundabout to Haddington Interchange (E)	13.4	
SALT	A1	West	Haddington Interchange (E) off slip	0.5	0.15
SALT	A1	West	Haddington Interchange (E) on slip	0.6	0.18
Travel	A1	West	Haddington Interchange (E) to Haddington Interchange (W)	2	
SALT	A1	West	Haddington Interchange (W) off slip	0.4	0.12
SALT	A1	West	Haddington Interchange (W) on slip	0.3	0.09
Travel	A1	West	Haddington Interchange (W) to Gladsmuir Interchange	3.3	
SALT	A1	West	Gladsmuir Interchange off slip	0.4	0.12
SALT	A1	West	Gladsmuir Interchange on slip	0.4	0.12
Travel	A1	West	Gladsmuir Interchange to Tranent Interchange (E)	4	
SALT	A1	West	Tranent Interchange (E) off slip	0.5	0.15
SALT	A1	West	Tranent Interchange (E) on slip	0.3	0.09
Travel	A1	West	Tranent Interchange (E) to Tranent Interchange (W)	1.3	
SALT	A1	West	Tranent Interchange (W) off slip	0.5	0.15
SALT	A1	West	Tranent Interchange (W) on slip	0.5	0.15
Travel	A1	West	Tranent Interchange (W) to Wallyford Interchange	2.1	
SALT	A1	West	Wallyford Interchange off slip	0.5	0.15
SALT	A1	West	Wallyford Interchange on slip	0.4	0.12
Travel	A1	West	Wallyford Interchange to Old Craighall Interchange	1.7	
SALT	A1	West	Old Craighall Interchange off slip	0.5	0.15
Travel	A720	West	Old Craighall Roundabout to Millerhill Interchange	0.9	
SALT	A720	West	Millerhill Interchange off slip	0.4	0.13
SALT	A720	West	Millerhill Interchange on slip	0.4	0.13
			Totals	**79.4**	**14.11**

Depot:	Bonnyrigg	**Route:**	**SE40R09**
Spread Rate:	Up to 40g/m²	**Route Length:**	79.4 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	39.8 km
Depot to Route:	8 km	**Route Time:**	70.4 mins
Depot to Route:	8 mins	**Route Coverage:**	14.05 tonnes
Route to Depot:	6.4 km	**Route Average Width:**	9.0 m
Route to Depot:	6.4 mins	**Route Average Speed:**	68 km/h

A = 8.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 77.5 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 36.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 6.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 91.9) x 36.8 = 40%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Charlesfield depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A720	East	Millerhill Interchange off slip	0.3	0.1
SALT	A720	East	Millerhill Interchange on slip	0.4	0.13
Travel	A720	East	Millerhill Interchange to Old Craighall Roundabout	0.8	
SALT	A720		Old Craighall Roundabout	0.4	0.15
SALT	A1	East	Old Craighall Interchange on slip	0.5	0.15
Travel	A1	East	Old Craighall Interchange to Wallyford Interchange	1.5	
SALT	A1	East	Wallyford Interchange off slip	0.6	0.18
SALT	A1	East	Wallyford Interchange on slip	0.4	0.12
Travel	A1	East	Wallyford Interchange to Tranent Interchange (W)	2.2	
SALT	A1	East	Tranent Interchange (W) off slip	0.3	0.09
SALT	A1	East	Tranent Interchange (W) on slip	0.4	0.12
Travel	A1	East	Tranent Interchange (W) to Tranent Interchange (E)	1.8	
SALT	A1	East	Tranent Interchange (E) off slip	0.3	0.09
SALT	A1	East	Tranent Interchange (E) on slip	0.3	0.09
Travel	A1	East	Tranent Interchange to Gladsmuir Interchange	4	
SALT	A1	East	Gladsmuir Interchange off slip	0.4	0.12
SALT	A1	East	Gladsmuir Interchange on slip	0.4	0.12
Travel	A1	East	Gladsmuir Interchange to Haddington (W) Interchange	2.9	
SALT	A1	East	Haddington Interchange (W) off slip	0.4	0.12
SALT	A1	East	Haddington Interchange (W) on slip	0.3	0.09
Travel	A1	East	Haddington Interchange (W) to Haddington Interchange (E)	2.5	
SALT	A1	East	Haddington Interchange (E) off slip	0.6	0.18
SALT	A1	East	Haddington Interchange (E) on slip	0.4	0.12
Travel	A1	East	Haddington Interchange (E) to Thistlycross Roundabout	13.4	
Turn	A1		Thistlycross Roundabout	0.2	
Travel	A1	West	Thistlycross Roundabout to Tyne Bridge	7	
SALT	A1	West	Tyne Bridge to Newcraighall Roundabout	29.5	10.66
Turn	A1		Newcraighall Roundabout	0.3	
Travel	A1	East	Newcraighall Roundabout to Old Craighall Interchange	3.0	
SALT	A1	East	Old Craighall Interchange off slip	0.4	0.12
SALT	A720	West	Old Craighall Roundabout to Sheriffhall Roundabout	3.5	1.3
			Totals	**79.4**	**14.05**

Depot:	Rosyth	**Route:**	**SE40R10**
Spread Rate:	Up to 40g/m²	**Route Length:**	60.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	31.4 km
Depot to Route:	16.7 km	**Route Time:**	54 mins
Depot to Route:	12 mins	**Route Coverage:**	12.37 tonnes
Route to Depot:	29 km	**Route Average Width:**	9.7 m
Route to Depot:	22 mins	**Route Average Speed:**	67 km/h

A = 16.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 60.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 31.4 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 29 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 98.8) x 31.4 = 32%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Burghmuir depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
Salt	M8	East	End of on slip from M9 Jct2 to Hermiston Roundabout	5.6	1.08
SALT	A720	West	Hermiston Interchange on slip	0.4	0.13
Travel	A720	West	Hermiston Interchange to Gogar Roundabout	1.3	
Turn	A8		Gogar Roundabout	0.4	
Travel	A720	East	Gogar Roundabout to Hermiston Interchange	0.6	
SALT	A720	East	Hermiston Interchange to end of Baberton Interchange on slip	4.1	1.53
Travel	A720	East	Baberton Interchange to Dreghorn Interchange	3.1	
Turn	A720		Dreghorn Interchange	0.7	
Travel	A720	West	Dreghorn Interchange to Baberton off slip	3.3	
SALT	A720	West	Baberton Interchange to Gogar Roundabout	4.7	1.75
Turn	A8		Gogar Roundabout	0.4	
Travel	A720	East	Gogar Roundabout to Hermiston Interchange	1.3	
SALT	A720	East	Hermiston Interchange off slip	0.3	0.1
SALT	M8	East /West	Start of access eastbound to end of access westbound excluding Retail Park roundabout	0.4	0.16
SALT	A720	East	Hermiston Interchange on slip	0.4	0.13
Travel	A720	East	Hermiston Interchange to Dreghorn Interchange	5.5	
Turn	A720		Dreghorn Interchange	0.7	
Travel	A720	West	Dreghorn Interchange to Hermiston Interchange off slip	5.9	
SALT	A720	West	Hermiston Interchange off slip	0.3	0.1
SALT	A720		Hermiston Roundabout (Inner lanes)	0.4	0.13
SALT	A720		Hermiston Roundabout (outer lanes)	0.4	0.12
SALT	M8	West	Hermiston Roundabout to Union Canal	10.1	4.18
Travel	M8	West	Union Canal to J3	3.9	
Turn	M8		J3	1.6	
SALT	M8	East	Union Canal to End of Jct2 slip from M8	4.3	
				60.1	**12.37**

Depot:	Bonnyrigg	**Route:**	**SE40R11**
Spread Rate:	Up to 40g/m²	**Route Length:**	59.5 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	34.9 km
Depot to Route:	6.4 km	**Route Time:**	54 mins
Depot to Route:	6.4 mins	**Route Coverage:**	13.43 tonnes
Route to Depot:	6.4 km	**Route Average Width:**	9.7 m
Route to Depot:	6.4 mins	**Route Average Speed:**	65 km/h

A = 6.4 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 59.5km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 34.9 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 6.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 72.3) x 34.9 = 48%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Burghmuir depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	A720		Sheriffhall Roundabout (Outer lanes)	0.3	0.1
SALT	A720	West	Sheriffhall Roundabout to Straiton Interchange off slip		
SALT	A720	West	Straiton Interchange off slip	0.3	0.1
Travel			Straiton Interchange off slip to Straiton Interchange on slip	0.5	
SALT	A720	East	Straiton Interchange on slip	0.5	0.16
Travel	A720	East	Straiton Interchange to Gilmerton Interchange	2.5	
SALT	A720	East	Gilmerton Interchange off slip	0.4	0.12
SALT	A720	West	Gilmerton Interchange on slip	0.4	0.13
Travel	A720	West	Gilmerton Interchange on slip to Straiton Interchange on slip	3.0	
SALT	A720	West	Straiton Interchange on slip	0.6	0.19
Travel	A720	West	Straiton Interchange to Lothianburn Interchange	1.9	
SALT	A720	West	Lothianburn Interchange off slip	0.3	0.1
SALT	A702	South	Hillend	1.2	0.34
SALT	A702	South	Hillend to Mauricewood Roundabout	4.6	1.29
SALT	A702		Mauricewood Roundabout	0.3	0.1
Travel	A702	North	Mauricewood Roundabout to Lothianburn	5.8	
SALT	A720	West	Lothianburn Interchange on slip	0.5	0.16
Travel	A720	West	Lothianburn Interchange to Dreghorn Interchange	1.2	
SALT	A720	West	Dreghorn Interchange off slip	0.3	0.1
SALT	A720	West	Dreghorn Interchange on slip	0.3	0.1
Travel	A720	West	Dreghorn Interchange to Baberton Interchange	3.1	
SALT	A720	West	Baberton Interchange off slip	0.3	0.1
Turn	U/C		Baberton Mains View	0.3	
SALT	A720	East	Baberton Interchange on slip	0.3	0.1
SALT	A720	East	Dreghorn Interchange off slip	0.3	0.1
SALT	A720	East	Dreghorn Interchange on slip	0.4	0.13

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
Travel	A720	East	Dreghorn Interchange to Lothianburn Interchange	1.1	
SALT	A720	East	Lothianburn Interchange off slip	0.4	0.13
SALT	A702		North roundabout at Lothianburn Interchange	0.1	0.02
SALT	A702	South	North roundabout to south roundabout at Lothianburn Interchange	0.2	0.05
SALT	A702		South roundabout at Lothianburn Interchange	0.1	0.02
SALT	A702	North	South roundabout to north roundabout at Lothianburn Interchange	0.2	0.05
SALT	A720	East	Lothianburn Interchange on slip	0.4	0.13
Travel	A720	East	Lothianburn Interchange to Straiton Interchange	2	
SALT	A720	East	Straiton Interchange off slip	0.4	0.13
Travel	A720	East	Straiton Interchange to Lasswade Interchange	0.9	
SALT	A720	East	Lasswade Interchange off slip	0.5	0.16
Turn	U/C		Lasswade road	0.1	
SALT	A720	West	Lasswade Interchange on slip	0.5	0.16
Travel	A720	West	Lasswade Interchange to Straiton Interchange	1.1	
Salt	A720	West	Straiton Interchange to Baberton Interchange off slip	8.2	1.59
Turn			Barbaton Mains	1.1	
Salt	A720	East	Baberton Interchange on slip to Sheriffhall Roundabout	12.3	2.38
SALT	A720		Sheriffhall Roundabout (Inner lanes)	0.3	0.11
				59.5	13.43

Depot:	Burghmuir	**Route:**	**SE40R12**
Spread Rate:	Up to 40g/m²	**Route Length:**	74.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	37.7 km
Depot to Route:	17.7 km	**Route Time:**	65.4 mins
Depot to Route:	17.7 mins	**Route Coverage:**	15.29 tonnes
Route to Depot:	11.4 km	**Route Average Width:**	10.1 m
Route to Depot:	11.4 mins	**Route Average Speed:**	68 km/h

A = 17.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 74.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 37.7 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 11.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 103.2) x 37.7 = 37%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Burghmuir depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M8	West	Union Canal to J6 Newhouse	30.7	13.02
Turn	M8		J6 Newhouse	3.2	
Travel	M8	East	J6 Newhouse to J5 Shotts	6.4	
SALT	M8	East	J5 off slip	0.5	0.16
Turn	B7066			1	
SALT	M8	East	J5 on slip	0.5	0.16
Travel	M8	East	J5 Shotts to Harthill Services	2.6	
SALT	M8	East	Start Harthill Services off slip to end of on slip	0.8	0.26
Travel	M8	East	Harthill Services to J4A Heartlands	2.9	
SALT	M8	East	J4A off slip	0.4	0.13
SALT	M8	East	J4A on slip	0.3	0.1
Travel	M8	East	J4A Heartlands to J4 Whitburn	2.6	
SALT	M8	East	J4 off slip	0.4	0.13
SALT	M8	East	J4 on slip	0.5	0.16
Travel	M8	East	J4 Whitburn to J3A Starlaw	3.8	
SALT	M8	East	J3A off slip	0.3	0.1
SALT	M8	East	J3A on slip	0.5	0.16
Travel	M8	East	J3A Starlaw to J3 Livingston	3.8	
SALT	M8	East	J3 off slip	1.5	0.48
SALT	M8	East	J3 on slip	1.1	0.35
Travel	M8	East	J3 to J2	8.2	
Travel	M9	North	M8 J2 to J1	0.6	
Travel	M9	North	J1 off slip	0.3	
SALT	M9	North	J1 dedicated off slip	0.1	0.04
Turn	U/C		Old Liston Road	1	
SALT	M9	North	Dedicated on slip	0.1	0.04
			Totals	**74.1**	**15.29**

Depot:	Burghmuir	**Route:**	**SE40R13**
Spread Rate:	Up to 40g/m²	**Route Length:**	77.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	36.8 km
Depot to Route:	12.7 km	**Route Time:**	68.0 mins
Depot to Route:	12.7 mins	**Route Coverage:**	14.97 tonnes
Route to Depot:	17.4 km	**Route Average Width:**	10.2 m
Route to Depot:	17.4 mins	**Route Average Speed:**	68 km/h

A = 12.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 77.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 36.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

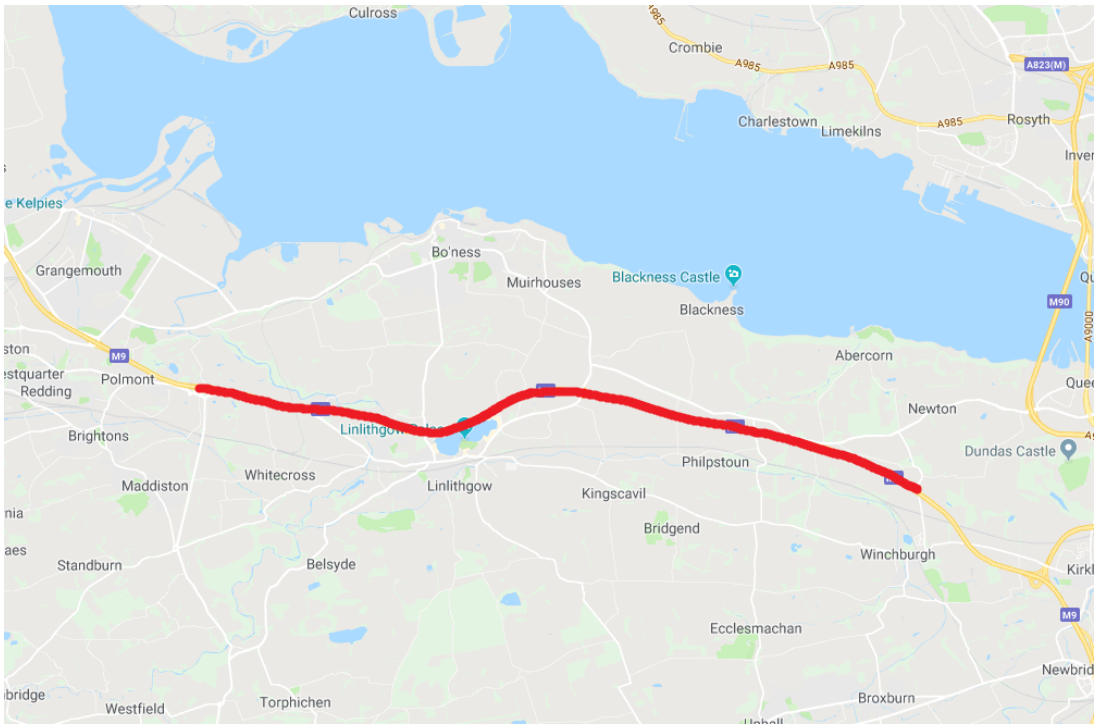
D = 17.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 107.2) x 36.8 = 34%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Bonnyrigg or Burghmuir depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	South	J1 dedicated slip to A8	0.2	0.06
Travel	A8	East	Newbridge Roundabout to Edinburgh airport access	2.3	
Turn	A8		Edinburgh airport access	0.9	
Travel	A8	West	Edinburgh airport access to Newbridge Roundabout	2.3	
SALT	M9	South	J1 dedicated on slip	0.1	0.04
Travel	M8	West	M9 J1 to J3	8.7	
SALT	M8	West	J3 off slip	0.5	0.16
SALT	M8	West	J3 on slip	0.5	0.16
Travel	M8	West	J3 Livingston to J3A Starlaw	5.3	
SALT	M8	West	J3A off slip	0.7	0.22
SALT	M8	West	J3A on slip	0.8	0.26
Travel	M8	West	J3A Starlaw to J4 Whitburn	2.9	
SALT	M8	West	J4 off slip	0.5	0.16
SALT	M8	West	J4 on slip	0.5	0.16
Travel	M8	West	J4 Whitburn to J4A Heartlands	2.5	
SALT	M8	West	J4A off slip	0.3	0.1
SALT	M8	West	J4A on slip	0.4	0.13
Travel	M8	West	J4A Heartlands to Harthill Services	2.9	
SALT	M8	West	Start Harthill Services off slip to end of on slip	0.8	0.26
Travel	M8	West	Harthill Services to J5 Shotts	2.4	
SALT	M8	West	J5 off slip	0.4	0.13
Turn	B7066			0.5	
SALT	M8	West	J5 on slip	0.5	0.16
Travel	M8	West	J5 Shotts to J6 Newhouse	6.4	
Turn	M8		J6 Newhouse	3.2	
SALT	M8	East	J6 Newhouse to Union Canal	30.6	12.97
			Totals	**77.1**	**14.97**

Depot:	Burghmuir	**Route:**	**SE40R14**
Spread Rate:	Up to 40g/m²	**Route Length:**	79.0 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	33.3 km
Depot to Route:	0.7 km	**Route Time:**	70.8 mins
Depot to Route:	0.7 mins	**Route Coverage:**	13.79 tonnes
Route to Depot:	0.6 km	**Route Average Width:**	10.3 m
Route to Depot:	0.6 mins	**Route Average Speed:**	68 km/h



A = 0.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 79.0 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 33.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 0.6 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 80.3) x 33.3 = 41%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir or Rosyth depots by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	South	J3 on slip	0.5	0.16
SALT	M9	South	J3 Burghmuir to B8020 Underpass at Duntarvie Castle	6.5	2.76
Travel	M9	South	B8020 Underpass to J1 Newbridge	4.5	
Turn	M9		J1 Newbridge	1.9	
Travel	M9	North	J1 Newbridge to B8020 Underpass at Duntarvie Castle	4.6	
SALT	M9	North	B8020 Underpass to J4 Lathallan	15.2	6.44
Travel	M9	North	J4 Lathallan to J5 Cadgers Brae	1.3	
Turn	M9		J5 Cadgers Brae	1.5	
Travel	M9	South	J5 Cadgers Brae to J4 Lathallan	1.2	
SALT	M9	South	J4 Lathallan to J3 Burghmuir	8.7	3.69
Travel	M9	South	J3 Burghmuir to J2 Philpstoun	2.6	
SALT	M9	South	J2 off slip	0.4	0.13
Turn			J2 Philpstoun	0.1	
SALT	M9	North	J2 on slip	0.4	0.13
Travel	M9	North	J2 to J4 Lathallan	10	
SALT	M9	North	J4 off slip	0.5	0.16
SALT	M9	North	J4 on slip	0.6	0.19
Travel	M9	North	J4 Lathallan to J5 Cadgers Brae	1.6	
Turn	M9		J5 Cadgers Brae	0.4	
Travel	M9	South	J5 Cadgers Brae to J2 Philpstoun	12.4	
Turn	M9		J2 Philpstoun	0.9	
Travel	M9	North	J2 Philpstoun to J3 Burghmuir	2.7	
SALT	M9	North	J3 off slip	0.5	0.16
			Totals	**79.0**	**13.82**

Depot:	Burghmuir	**Route:**	**SE40R15**
Spread Rate:	Up to 40g/m²	**Route Length:**	74.3 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	36.3 km
Depot to Route:	10.3 km	**Route Time:**	65.6 mins
Depot to Route:	10.3 mins	**Route Coverage:**	15.01 tonnes
Route to Depot:	16.0 km	**Route Average Width:**	10.3 m
Route to Depot:	16.0 mins	**Route Average Speed:**	68 km/h

A = 10.3 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 74.3 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 36.3 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 16.0 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 100.6) x 36.3 = 36%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Chryston depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	North	J5 off slip	0.7	0.3
SALT	M9	North	J5 on slip	0.4	0.17
Travel	M9	North	J5 Cadgers Brae to J9 Pirnhall	15.5	
SALT	M9	North	J9 off slip	0.7	0.22
SALT	M9	North	J9 on slip	0.6	0.19
Travel	M9	North	J9 Pirnhall to J10 Craigforth	6.6	
SALT	M9	North	J10 off slip	0.7	0.22
SALT	M9	North	J10 on slip	0.6	0.19
Travel	M9	North	J10 Craigforth to J11 Keir Roundabout	3.9	
Turn	A9		Keir Roundabout	0.4	
SALT	M9	South	J11 Keir Roundabout to J7 Kincardine	21.6	9.16
Travel	M9	South	J7 Kincardine to J6 Earls Gate	3.1	
SALT	M9	South	J6 off slip	0.5	0.16
Travel	A905		J8 Earlsgate Roundabout	1	
SALT	M9	North	J6 on slip	0.5	0.16
Travel	M9	North	J6 Earls Gate to J7 Kincardine	3.9	
SALT	M9	North	J7 off slip	1.7	0..72
Travel	M876	East	J7 to M876 J3 Bowtrees	1	
Turn	M876		J3 Bowtrees	0.4	
Travel	M876	West	J3 Bowtrees to M9 J7 Kincardine	2.2	
SALT	M9	South	J7 Kincardine to J4 Lathallan	8.3	3.52
			Totals	**74.3**	**15.01**

Depot:	Burghmuir	**Route:**	**SE40R16**
Spread Rate:	Up to 40g/m²	**Route Length:**	66.3 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	34.8 km
Depot to Route:	9.4 km	**Route Time:**	58.5 mins
Depot to Route:	9.4 mins	**Route Coverage:**	14.36 tonnes
Route to Depot:	13.4 km	**Route Average Width:**	10.3 m
Route to Depot:	13.4 mins	**Route Average Speed:**	68 km/h

A = 9.4 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 66.3 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 34.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 13.4 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 89.1) x 34.8 = 39%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Chryston depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M9	North	J4 to J11 Keir Roundabout	30	12.72
Turn	A9		Keir Roundabout	0.4	
Travel	M9	South	J11 Keir Roundabout to J10	4	
SALT	M9	South	J10 off slip	0.6	0.19
SALT	M9	South	J10 on slip	0.6	0.19
Travel	M9	South	J10 to J9	6.4	
SALT	M9	South	J9 off slip	0.6	0.19
SALT	M9	South	J9 on slip	0.6	0.19
Travel	M9	South	J9 onslip to J7 Kincardine	9.6	
Travel	M876	East	J7 to M876 J3 Bowtrees	1	
Turn	M876		J3 Bowtrees	0.4	
Travel	M876	West	J3 Bowtrees to M9 J7 Kincardine	2.2	
SALT	M9	South	M9 J7 on slip	0.5	0.21
Travel	M9	South	J7 to J5	5.2	
SALT	M9	South	J5 off slip	0.3	0.1
Travel	A905	South	J5 off slip to Cadgers Brae Roundabout	1.1	
SALT	M9	South	J5 on slip	0.6	0.25
Travel	M9	South	J5 to J4	1.2	
SALT	M9	South	J4 off slip	0.6	0.19
SALT	M9	South	J4 on slip	0.4	0.13
			Totals	**66.3**	**14.36**

Depot:	Chryston	**Route:**	**SE40R17**
Spread Rate:	Up to 40g/m²	**Route Length:**	71.2 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	31.2 km
Depot to Route:	15.0 km	**Route Time:**	62.8 mins
Depot to Route:	15.0 mins	**Route Coverage:**	13.01 tonnes
Route to Depot:	15.0 km	**Route Average Width:**	10.4 m
Route to Depot:	15.0 mins	**Route Average Speed:**	68 km/h

A = 15.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 71.2 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 31.2 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 15.0 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 101.2) x 31.2 = 31%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M80	North	J7 Haggs to M9	11.6	4.92
Travel	M9	North	M80 to J10	5.4	
Turn	M9		J10	1.9	
Travel	M9	South	J10 to J9	6.4	
Turn	M9		J9	1	
SALT	M80	South	On slip from M9 J9	0.8	0.34
Travel	M80	South	M9 J9 to J7 Haggs	9.4	
Turn	M80		J7 Haggs	1.3	
Travel	M80	East	J7 Haggs to M876	1.2	
Travel	M876	East	M80 to J1	3.3	
SALT	M876	East	J1 off slip	0.3	0.1
Turn	A883		Checkbar Roundabout	1	
SALT	M876	East	J1 on slip	0.3	0.1
Travel	M876	East	J1 to J2	1.8	
SALT	M876	East	J2 off slip	1	0.42
Travel	A9	North	J2 off slip, Stirling Road, to J2 on slip	0.6	
SALT	M876	East	J2 on slip	0.5	0.16
Travel	M876	East	J2 to M9 J8	2.4	
Travel	M9	East	M9 J8 to M9 J7 Kincardine	1.3	
Travel	M876	East	M9 J7 Kincardine to J3 Bowtrees	1.6	
SALT	M876	East	J3 Bowtrees off slip	0.6	0.19
SALT	M876	East	J3 Bowtrees on slip	0.4	0.13
Travel	M876	East	J3 Bowtrees to Higgins Neuk Roundabout	1.1	
Turn	A876		Higgins Neuk Roundabout	0.3	
SALT	A876	West	Higgins Neuk Roundabout to M876	1.2	0.51
SALT	M876	West	J3 Bowtees to M9 J7 Kincardine	3.5	1.48
SALT	M9	West	J7 Kincardine to J8	1.2	0.51
SALT	M876	West	M9 J8 to M80	8.5	3.6
SALT	M80	West	M876 to J7 Haggs	1.3	0.55
			Totals	**71.2**	**13.01**

Depot:	Chryston	**Route:**	**SE40R18**
Spread Rate:	Up to 40g/m²	**Route Length:**	71.4 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	31.7 km
Depot to Route:	15.0 km	**Route Time:**	63.0 mins
Depot to Route:	15.0 mins	**Route Coverage:**	13.05 tonnes
Route to Depot:	15.0 km	**Route Average Width:**	10.3 m
Route to Depot:	15.0 mins	**Route Average Speed:**	68 km/h

A = 15.0 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 71.4 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 31.7 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 15.0 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 101.4) x 31.7 = 31%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M80	East	J7 Haggs to M876	1.2	0.51
SALT	M876	East	M80 to M9 J8	8.9	3.77
SALT	M9	East	J8 to J7	1.4	0.59
SALT	M876	East	M9 J7 to A876	2.6	1.1
SALT	A876	East	M876 to Higgins Neuk Roundabout	1.3	0.55
Turn	A876		Higgins Neuk Roundabout	0.3	
Travel	A876	West	Higgins Neuk Roundabout to J3 Bowtrees	1.0	
SALT	M876	West	J3 Bowtrees off slip	0.7	0.22
SALT	M876	West	J3 Bowtrees on slip	0.4	0.13
Travel	M876	West	J3 to M9 J7	2.6	
Travel	M9	West	J7 to J8	1.2	
Travel	M876	West	M9 J8 to J2	2.2	
SALT	M876	West	J2 off slip	0.4	0.13
Travel	A9	South	J2 off slip, Stirling Road, to J2 on slip	0.6	
SALT	M876	West	J2 on slip	1.1	0.35
Travel	M876	West	J2 to J1	1.2	
SALT	M876	West	J1 off slip	0.3	0.1
Travel	B905 & A8004	West	J1 off slip, Checkbar Roundabout, to J1 on slip	1.1	
SALT	M876	West	J1 on slip	0.3	0.1
Travel	M876	West	J1 to M80	2.6	
Travel	M80	West	M876 to J7 Haggs	1.4	
Turn	M80		J7 Haggs	1.3	
Travel	M80	North	J7 Haggs to M9 J9	9.4	
SALT	M80	North	Off slip to M9 J9	1	0.42
SALT	M9		Bannockburn Roundabout	1	0.37
Travel	M9	North	J9 on slip	0.5	
Travel	M9	North	J9 to J10	6.6	
Turn	M9		J10	1.9	
Travel	M9	South	J10 to M80	5.8	
SALT	M80	South	M9 to J7 Haggs	11.1	4.71
			Totals	**71.4**	**13.05**

Depot:	Lochgelly	**Route:**	**SE40R19**
Spread Rate:	Up to 40g/m²	**Route Length:**	108.1 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	35.8 km
Depot to Route:	11.5 km	**Route Time:**	101.4 mins
Depot to Route:	11.5 mins	**Route Coverage:**	13.09 tonnes
Route to Depot:	13.9 km	**Route Average Width:**	9.1 m
Route to Depot:	13.9 mins	**Route Average Speed:**	64 km/h

A = 11.5 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 108.1 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 35.8 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 13.9 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 133.5) x 35.8 = 26%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M90	South	J3 Halbeath on slip	0.4	0.13
Travel	M90	South	J3 Halbeath, Ferry Toll RBT	6.8	
SALT	A9000	South	Start on slip to FRB to end on slip ONLY	0.7	0.11
Travel	A9000	South	Forth rod bridge to off slip to Echline rbt	2.7	
SALT	A9000	East	Dedicated bus lane to A90	2.1	0.26
Travel	A90	East	End of dedicated bus lane to Burnshot Junction	3.3	
Turn	A90		Burnshot junction	0.7	
Travel	A90	West	Burnshot junction to start of dedicated bus lane	0.7	
SALT	A90	West	Dedicated bus lane to B800	0.8	0.08
Travel	B800	North	End of dedicated bus lane to Echline RBT	1.0	
Travel	A904	West	Echline RBT to Queensferry RBT	1.2	
SALT	A90	South	J1A Queensferry on slip	0.5	0.16
Travel	A90 /M90	South	J1A to M9 Kirkliston	5.7	
SALT	M9	North	J1A on slip (fork right)	1.1	0.47
Travel	M9	North	J1A Kirkliston to J3 Burghmuir	9.3	
Turn	M9		J3 Burghmuir	0.1	
Travel	M9	South	J3 to B8020 Underpass at Duntarvie Castle	6.9	
SALT	M9	South	B8020 Underpass at Duntarvie Castle to M8 J2	7.5	3.18
Travel	M8	West	J2 Claylands to J3 Dechmont	6.4	
Travel	M8	West	J3 Dechmont off slip	0.2	
SALT	M8	West	J3 dedicated off slip to A899	0.5	0.16
Travel	A899	South	M8 J3 to Huston Interchange	0.6	
Turn	A889		Huston Interchange	1.3	
Travel	A899	North	Huston Interchange to M8 J3 Dechmont	1.5	
Travel	M8	East	J3 on slip	0.9	
Travel	M8	East	J3 Dechmont to J2 Claylands	7.3	
SALT	M8	East	J2 Claylands off slip to M9	1.0	0.42
Travel	M9	North	M8 J2 to J1 Newbridge	0.6	
SALT	M9	North	J1 Newbridge off slip	0.4	0.13
SALT	M9	North	J1 Newbridge on slip	0.5	0.16
SALT	M9	North	J1 Newbridge to J1A Kirkliston	1.4	0.45
SALT	M9	North	J1A Kirkliston off slip	1.3	0.55
SALT	M90	North	M9 to J1A Queensferry	6.0	2.3
SALT	M90	North	J1A Queensferry off slip	0.4	0.13
Turn	A904		Queensferry Roundabout	0.3	
Travel	A90	South	J1A Queensferry on slip	0.5	
Travel	M90	South	J1A to J1 Scotstoun	2.0	
SALT	M90	East	J1 Scotstoun off slip to A90 Dalmeny	1.6	0.51
Travel	A90	East	M90 J1 to Burnshot Interchange	2.0	
Turn	A90		Burnshot Interchange	0.7	
Travel	A90	West	Burnshot Interchange to M90 J1 Scotstoun	20.0	

SALT	M90	North	J1 Scotstoun on slip	1.8	0.58
SALT	M90	North	J1 to J1A Queensferry	2.0	
Travel	M90	North	J1A Queensferry to Mid-point J1B Ferrytoll	4.3	
SALT	M90	North	Mid-point J1B Ferrytoll to J3 Halbeath	7.8	3.31
			Totals	**108.1**	**13.09**

Depot:	Rosyth	**Route:**	**SE40R20**
Spread Rate:	Up to 40g/m²	**Route Length:**	98.35 km
Treatment Type:	Pre-wetted salt	**Route Treated Length:**	33.75 km
Depot to Route:	1.8 km	**Route Time:**	92.25 mins
Depot to Route:	1.8 mins	**Route Coverage:**	13.62 tonnes
Route to Depot:	11.7 km	**Route Average Width:**	10.1 m
Route to Depot:	11.7 mins	**Route Average Speed:**	64 km/h

A = 1.8 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 98.35 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 33.75 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 8.3 km – Distance from 3. end of route to 1. depot

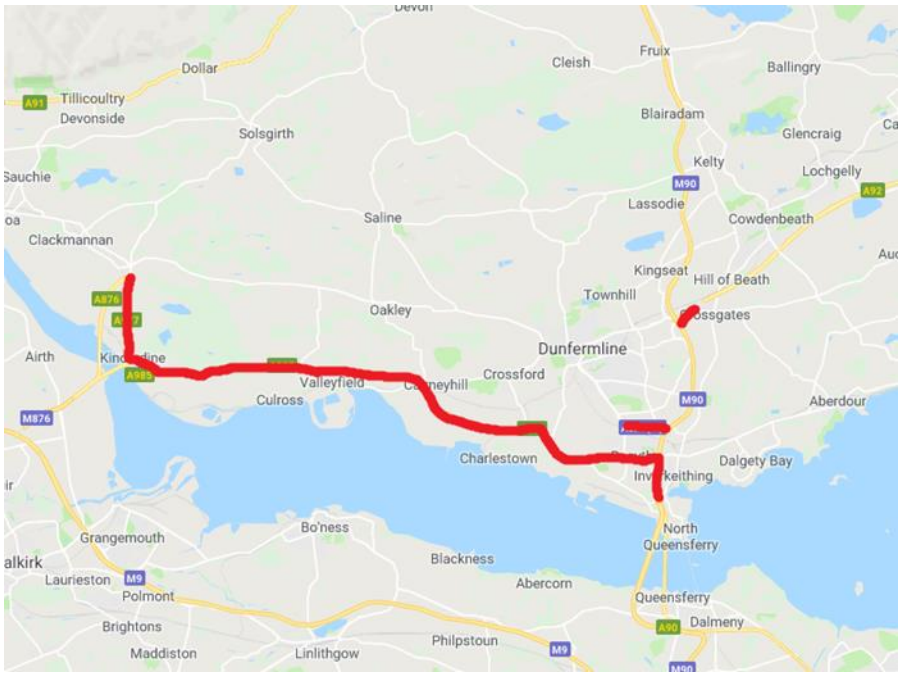
E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 108.45) x 33.75 = 31%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M90	North	J1B Ferrytoll on slip	0.5	0.16
Travel	M90	North	J1B Ferrytoll to J3 Halbeath	6.2	
SALT	M90	North	J3 Halbeath off slip	0.4	0.13
Travel	M90	North	J3 on slip	0.4	
Travel	M90	North	J3 Halbeath to J4 Kelty	4.8	
Turn	M90		J4 Kelty	1	
Travel	M90	South	J4 Kelty to J3 Halbeath	5	
SALT	M90	South	J3 Halbeath to mid-point J1B Ferrytoll	7.7	3.26
Travel	M90	South	J1B [Queensferry Crossing] to J1A	4.3	
SALT	A90	South	Mid-point of J1A to J1 Scotstoun	2.4	1.06
SALT	M90	South	J1 Scotstoun to M9 J1A Kirkliston	3.4	1.57
SALT	M9	South	J1A Kirkliston on slip (fork left)	0.5	0.21
SALT	M9	South	J1a on slip to J1 off slip	0.7	0.3
SALT	M9	South	J1 Newbridge off slip	1.2	0.51
SALT	M9	South	J1 Newbridge on slip	0.5	0.16
SALT	M9	South	J1 on slip to M8 J2 Claylands	0.5	0.16
SALT	M8	East	M8 J2 Claylands on slip	0.9	0.38
Travel	M8	West	J2 Claylands to J1 Hermiston	5.3	
SALT	M8	West	J1 Hermiston off slip to Gogar	1	0.42
Travel	A720	West	Hermiston Interchange to Gogar Roundabout	1.1	
Turn	A8		Gogar Roundabout	0.4	
Travel	A720	East	Gogar Roundabout to Hermiston Interchange	1	
SALT	A720	East	Gogar to Sighthill Link	1.4	0.45
Turn	A71		Calder Roundabout	0.3	
SALT	A720	West	Sighthill to Gogar Link	1.3	0.42
Travel	A720	West	Hermiston Interchange to Gogar Roundabout	1.1	
Turn	A8		Gogar Roundabout	0.4	
Travel	A720	East	Gogar to Hermiston Interchange	1.4	

Travel	A720	East	Hermiston Interchange off slip	0.4	
SALT	A720	East	Hermiston Interchange on slip to Calder Roundabout	0.7	0.22
Turn	A71		Calder Roundabout	0.3	
SALT	M8	West	J1 dedicated on slip to M8	1	0.42
Travel	M8	West	J1 Hermiston to J2 Claylands	4.9	
SALT	M8	West	J2 Claylands off slip to M9	1.6	0.72
SALT	M9	North	M8 J2 Claylands to B8020 overbridge	6	2.59
Travel	M9	North	B8020 underpass at Duntarvie Castle to J3	7	
Turn	M9		J3 Burghmuir	0.1	
Travel	M9	South	J3 Burghmuir to J1A Kirkliston off slip to M90	9.5	
SALT	M9	North	J1A Kirkliston off slip to M90	0.9	0.29
Travel	M90	North	Off slip to M90 to Queensferry Jct	5.7	
Travel	A904	East	Queensferry Jct to Echline Rbt	1.3	
Salt	A9000	North	On slip from Echline Roundabout ONLY	0.5	0.07
Travel	A9000	North	End of on slip from Echline RBT to Off slip to J1B Ferry toll	2.7	
Salt	A9000	North	Start J1B off slip to Ferry Toll RBT	0.65	0.12
			Totals	98.35	**13.62**

Depot:	Rosyth	**Route:**	**SE40R21**
Spread Rate:	Up to 40g/m²	**Route Length:**	69.5 km
Depot to Route:	10.2 mins	**Route Coverage:**	14.91 tonnes
Route to Depot:	41.0 km	**Route Average Width:**	8.0 m
Route to Depot:	41.0 mins	**Route Average Speed:**	56 km/h



A = 10.2 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 69.5 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 46.6 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 41.0km – Distance from 3. end of route to 1. depot

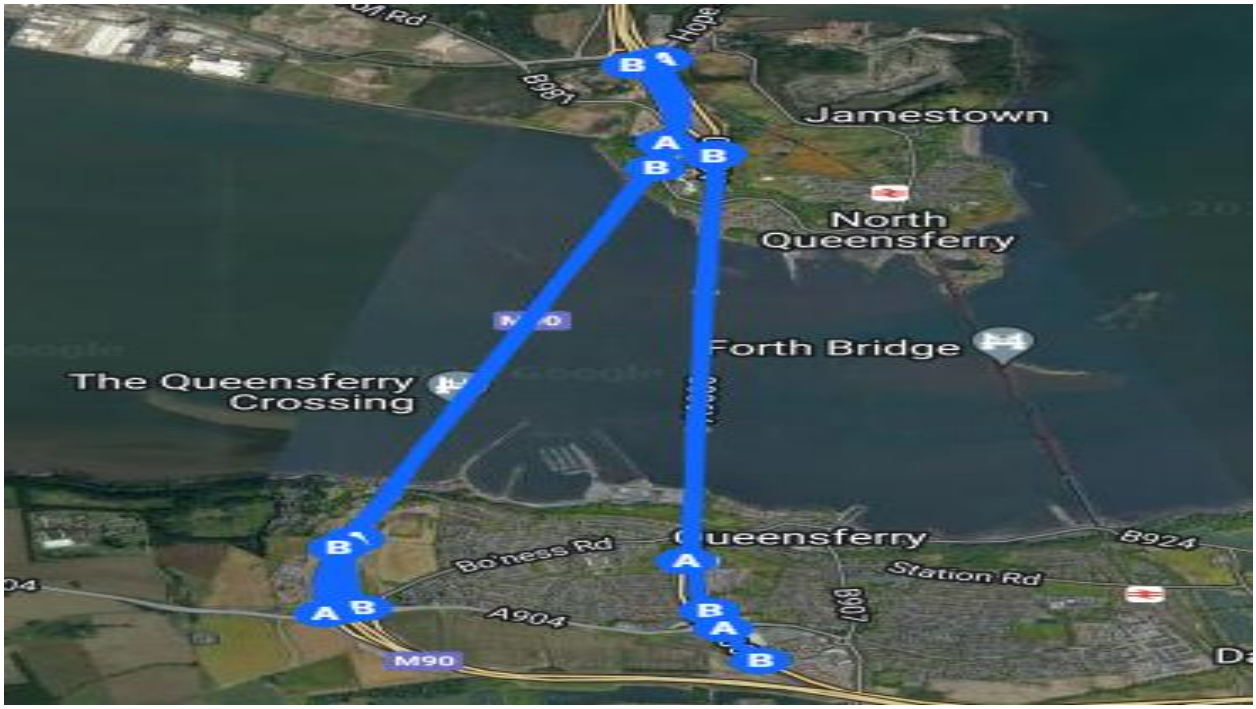
E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 120.7) x 46.6 = 38%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Tonnage (t)
SALT	M90	North	J1C Admiralty on slip	0.4	0.13
SALT	A823(M)	West	M90 to B980 roundabout	1.8	0.65
Turn	B980		B980 Roundabout	0.4	
SALT	A823(M)	East	B980 roundabout to M90 northbound	1.8	0.65
Travel	M90	North	J2 Masterton to J2A EFRR	3.2	
SALT	M90	East	J2A off slip to EFRR	2.1	0.67
Travel	A92	East	M90 J2A to Cowdenbeath Interchange	3	
Turn	A92		Cowdenbeath Interchange	1	
Travel	A92	West	Cowdenbeath Interchange to M90 J2A	2.8	
SALT	M90	South	J2A on slip to M90	1.8	0.58
Travel	M90	South	J2a to J2 Masterton	3.3	
SALT	A823(M)	West	M90 to B980 roundabout	2.1	0.67
Turn	B980		B980 Roundabout	0.4	
SALT	A823(M)	East	B980 roundabout to M90 southbound	2	0.64
SALT	M90	South	J2 Masterton to J1C Admiralty	0.6	0.19
SALT	M90	South	J1C Admiralty off slip	0.3	0.1
SALT	M90	South	J1C Admiralty on slip	0.3	0.1
Travel	M90	South	J1C Admiralty to J1B Ferrytoll	1	
SALT	M90	South	J1B Ferrytoll off slip	0.3	0.1
Turn			Ferrytoll Roundabout	0.4	
Travel	M90	North	J1B Ferrytoll to J1C Admiralty	1.3	
SALT	M90	North	J1C Admiralty off slip	0.4	0.13
SALT			Admiralty Road Roundabout	0.4	0.16
SALT	A985	East	Admiralty Road Roundabout to Queensferry Road Roundabout	0.5	0.2
SALT			Queensferry Road Roundabout	0.1	0.04
SALT	A985	East	Queensferry Road Roundabout to Kings Road Roundabout	0.8	0.32
SALT	A985		Kings Road Roundabout	0.1	0.04
SALT	A985	East	Kings Road Roundabout to Brankholm Brae Roundabout	0.7	0.28
SALT	A985		Brankholm Brae Roundabout	0.2	0.06
SALT	A985	East	Brankholm Brae Roundabout to Cairneyhill Roundabout	8	2.56
SALT	A985		Cairneyhill Roundabout	0.3	0.12
SALT	A985	East	Cairneyhill Roundabout to Longannet Roundabout	9.5	3.17
SALT	A985		Longannet Roundabout	0.2	0.08
SALT	A977	East	A985 Longannet Roundabout to Kilbagie Roundabout	4.3	1.72
SALT	A977		Kilbagie Roundabout	0.1	0.04
SALT	A977	East	Kilbagie Roundabout to Gartarry Roundabout	0.3	0.12
Travel	A977		Gartarry Roundabout to Kilbagie Roundabout	0.3	
SALT	A876		Kilbagie Roundabout to 200m prior to Clackmannanshire Bridge	2.4	0.24
Travel	A876		Clackmannanshire Bridge to 200m past Kincardine Bridge via Higgins Neuk RBT	2.9	

Salt	A985	East	200m past Kincardine Bridge to Longannet Rbt	1.2	0.12
Salt	A985	West	Longannet Rbt to 200m prior to Kincardine Bridge	1.2	0.12
Travel			200m prior to Kincardine Bridge to 200m after Clackmannanshire Bridge	2.9	
Salt	A876		200m after Clackmannanshire Bridge to Kilbagie Roundabout	2.4	0.24
			Totals	**69.5**	**14.91**

Depot:	Rosyth	**Route:**	**SE40R22 A**
Spread Rate:	Up to 0.0312 l/m²	**Route Length:**	52.65 km
Treatment Type:	Potassium Acetate	**Route Treated Length:**	17.15 km
Depot to Route:	3.6 km	**Route Time:**	49 mins
Depot to Route:	3.6 mins	**Route Coverage:**	3900 litres
Route to Depot:	2.3 km	**Route Average Width:**	7.3 m
Route to Depot:	2.3 mins	**Route Average Speed:**	56 km/h



A = 3.6 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 52.65 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 17.15 km – Total Distance treated from 2. start of route to 3. end of route (km)

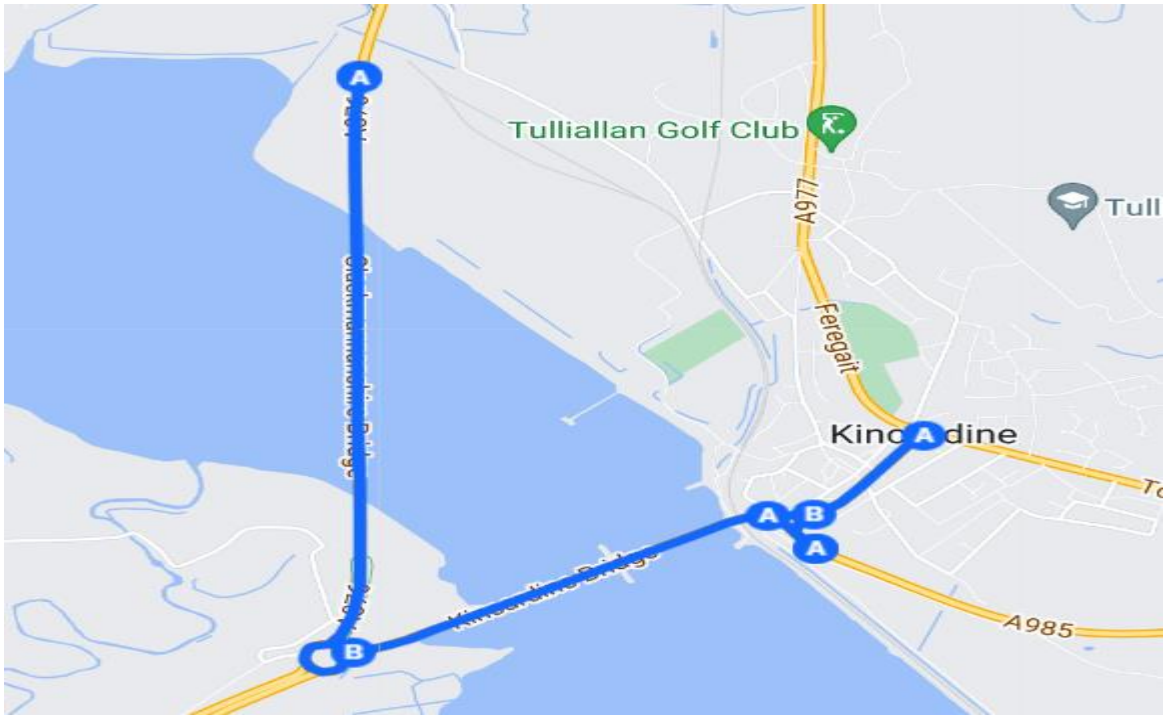
D = 2.3km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 / 58.55) x 17.15 = 29.29%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

Operation	Route	Direction	Route Description	Distance (km)	Volume (litres)
Travel	M90	South	J1C Admiralty on slip	0.3	
Travel	M90	South	J1C Admiralty to mid-point J1B Ferrytoll	1.3	
SPRAY	M90	South	Mid-point J1B Ferrytoll to mid-point J1A (Queensferry Crossing)	4.3	978
Travel	A90	East	Mid-point J1A to Burnshot Junction	6.1	
Turn	A90		Burnshot Junction	0.7	
Travel	A90	West	Burnshot Junction to mid-point J1A	6.2	
SPRAY	M90	North	Mid-point J1A to J1B (Queensferry Crossing)	4.3	978
Travel	M90	North	J1B Ferrytoll to J1C Admiralty	1.3	
Turn	M90		J1C Admiralty	0.9	
Travel	M90	South	J1C Admiralty to J1B Ferrytoll	1	
Travel	M90	South	J1B Ferrytoll off slip	0.4	
SPRAY	M90	South	J1B Ferrytoll on slip to M90	0.5	114
Travel	M90	South	Queensferry Crossing	3.3	
SPRAY	M90	South	J1A A904 Queensferry off slip	0.5	114
Turn	A940		Queensferry Roundabout	0.3	
SPRAY	M90	North	J1A A904 Queensferry on slip	0.5	114
Travel	M90	North	Queensfery Crossing	3.3	
SPRAY	M90	North	J1B Ferrytoll off slip	0.4	90
Turn	A90		J1B Ferry Toll Roundabout	0.4	
SPRAY	A9000	South	End of on slip to FRB to end of off slip Echline RBT (Forth Road Bridge)	3.45	784
SPRAY	A9000	East	On slip from Echline RBT to End of on slip.	0.3	68
Travel	A90	East	End of dedicated bus lane to Burnshot Junction	3.3	
Turn	A90		Burnshot junction	0.7	
Travel	A90	West	Burnshot junction to start of dedicated bus lane	3.5	
Travel	A90	West	Dedicated bus lane to B800	0.8	
Travel	B800	North	End of dedicated bus lane to A904 Ferrymuir Roundabout	1.2	
Travel	A9000	North	On slip from Echline Roundabout to FRB	0.5	
SPRAY	A9000	North	End of on slip from Echline to Start J1B off slip Ferry Toll (Forth Road Bridge)	2.9	660
				17.15	3900

Depot:	Rosyth	**Route:**	**SE40R22 B**
Spread Rate:	Up to 0.0312 l/m²	**Route Length:**	15.2 km
Treatment Type:	Potassium Acetate	**Route Treated Length:**	7.4 km
Depot to Route:	20.7 km	**Route Time:**	15 mins
Depot to Route:	19.5 mins	**Route Coverage:**	1682 litres
Route to Depot:	20.7 km	**Route Average Width:**	7.3 m
Route to Depot:	19.5 mins	**Route Average Speed:**	56 km/h



A = 20.7 km – Distance from 1. depot to 2. start of route (km) - (i.e dead time)

B = 15.2 km – Distance from 2. start of route to 3. end of route (km) – (i.e including any dead time from start to end of route for junctions etc hence optimisation)

C = 7.4 km – Total Distance treated from 2. start of route to 3. end of route (km)

D = 20.7 km – Distance from 3. end of route to 1. depot

E (Efficiency of Route) = (100 / (A + B + D)) x C = (100 /56.6) x 7.4 = 13.07%

Alternative Access: In the event of any blockage on the trunk road network that would require alternative access the frontline vehicle will treat to the point of the blockage and then use the local road network to reach the remainder of the route. A vehicle will be provided from the Burghmuir depot by utilising the trunk road and local road network should access be required from an alternative depot.

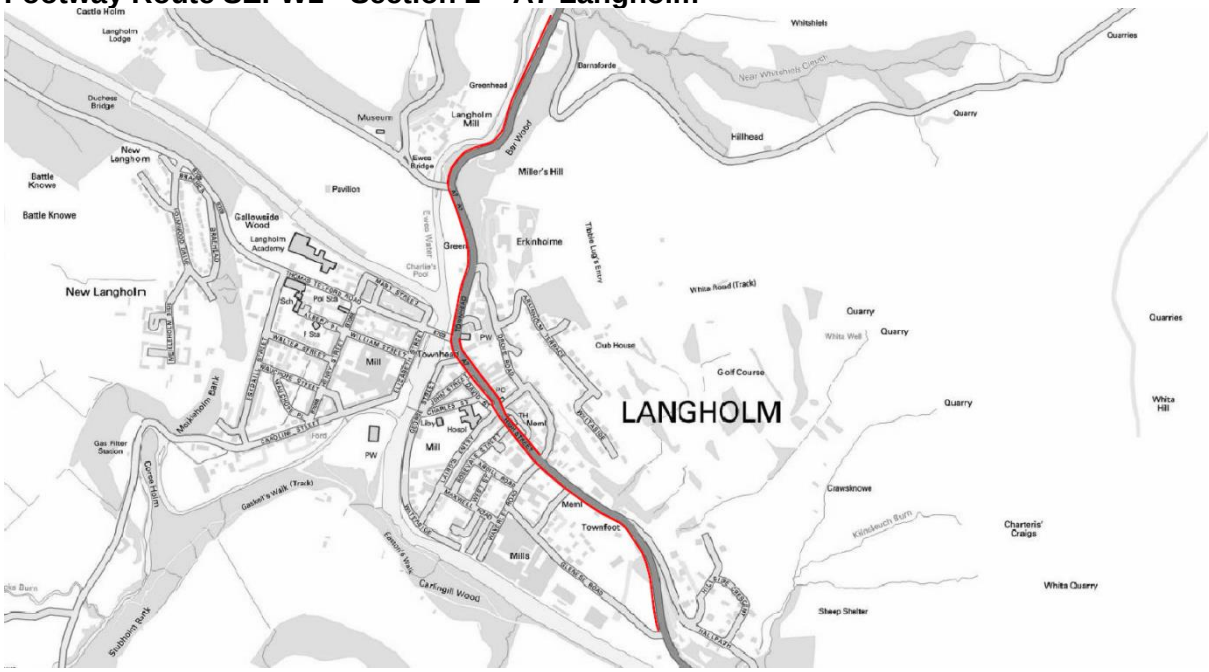
Operation	Route	Direction	Route Description	Distance (km)	Volume (litres)
SPRAY	A876	South	North Approach Road - TL to A985	0.5	114
SPRAY	A985	East	North Approach Road to 400yrd lane narrow sign.	0.2	46
Turn	A985		400yrd lane narrow sign to Longannet Roundabout	1.2	
Travel	A985		Longannet Roundabout to 200m prior to Kincardine bridge.	1.2	
SPRAY	A985	West	200m prior to Kincardine bridge.to Higgins Neuk Roundabout (Kincardine Bridge)	1.3	296
SPRAY	A876		Higgins Neuk Roundabout	0.3	68
SPRAY	A876	North	Higgins Neuk Roundabout to 200m after Clackmannanshire Bridge	1.9	432
Travel	A867	North	200m after Clackmannanshire Bridge to Kilbagie Roundabout	2.4	
Turn	A985		Kilbagie Roundabout	0.3	
Travel	A867	South	Kilbagie Roundabout to 200m prior to Clackmannanshire Bridge	2.4	
SPRAY	A876	South	200m prior to Clackmannanshire Bridge A876 Higgins Neuk Roundabout (Clackmannanshire Bridge)	1.7	386
Turn Left	A985		Higgins Neuk Roundabout	0.3	
SPRAY	A985	East	Higgins Neuk Roundabout to North Approach Road (Kincardine Bridge)	1	226
SPRAY	A876	North	North Approach Road	0.5	114
				7.4	1682

Appendix WSP2 – Footway, Footbridges and Cyclways – Category A Precautionary Treatment Routes

This table and the subsequent route cards have been prepared as per the requirements of Table 6.10.3 of Schedule 2 Appendix 6 Section 6.10.

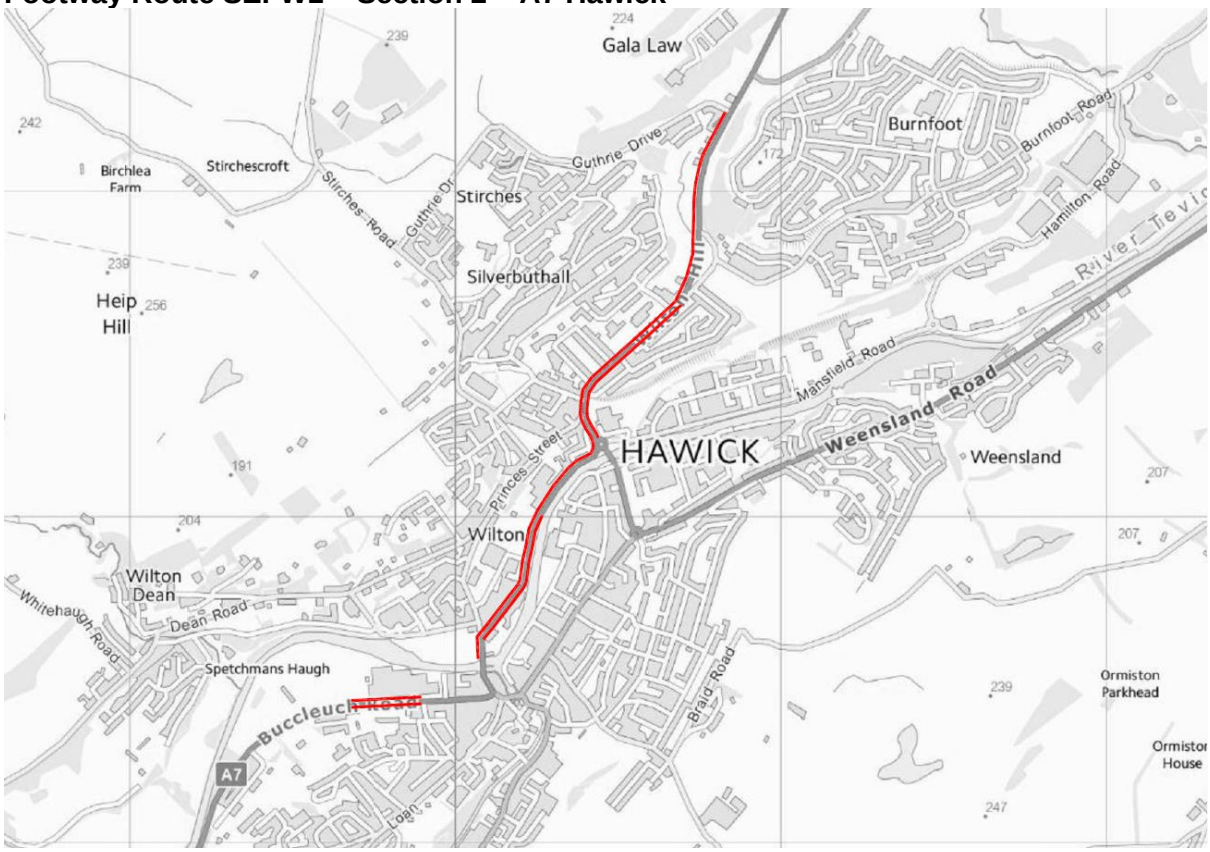
Route	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total route length (km)	Total route length treated (km)	Ave Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Average Width of Route (m)	Alternative Access	Route volume at 20 ml/m^2 (litres)	Route volume at 40ml/m^2 (litres)	Treatment
SEFW R1A/B	Charlesfield	A6091, A7 - Selkirk, Hawick, Langholm. A68 Lauder, Earlston, Jedburgh	64	55	196	17.4	14	390	30	2	A68/ A698	696	1392	Brine
SEFW R2	Bonnyrigg	A702 - Silverburn, Carlops, West Linton, Dolphington, Biggar, Coulter A68 Pathhead	50	49	130	10.4	19	340	20	1.8	A698/ A7	375	750	Brine
SEFW R3	Rosyth	A977/ A985 - Kincardine, Crombie, Rosyth	5	7	23.6	3.1	11.5	124	33	1.8	Burghmuir	112	224	Brine
SEFW R4	Queensferry	A9000 FRB footway/ cycleway/ plaza	0.2	1	10	10	6	100	0.4	3.6	Rosyth	720	1440	Potassium Acetate and Brine

Footway Route SEFW1 - Section 1 – A7 Langholm



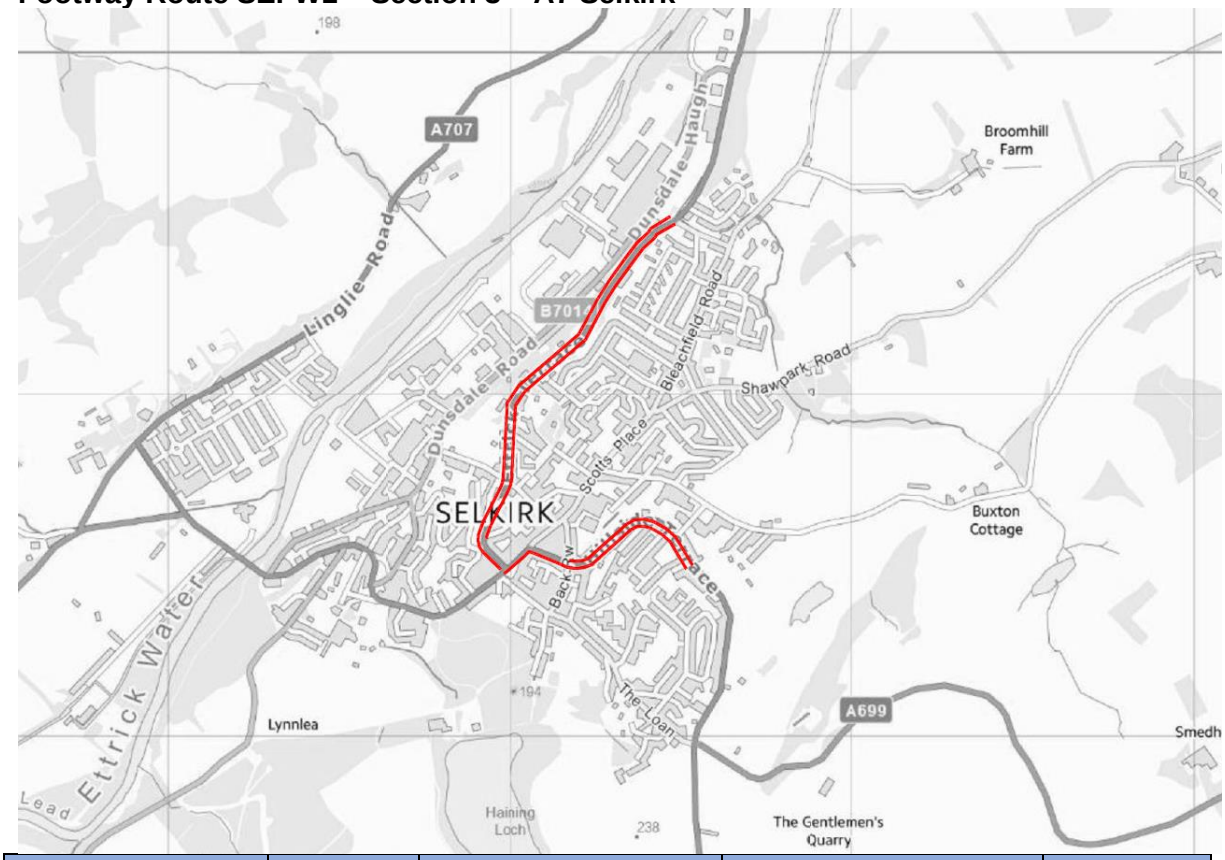
Name of Street	Side of street	Start	Finish	Route centreline length (m)
High Street	West	Glenesk Road	94 Main Street	570
High Street	Both	94 Main Street	Thomas Telford Road (Bridge)	285
Townhead	West	Thomas Telford Road (Bridge)	(11006/05/290)	645

Footway Route SEFW1 – Section 2 – A7 Hawick



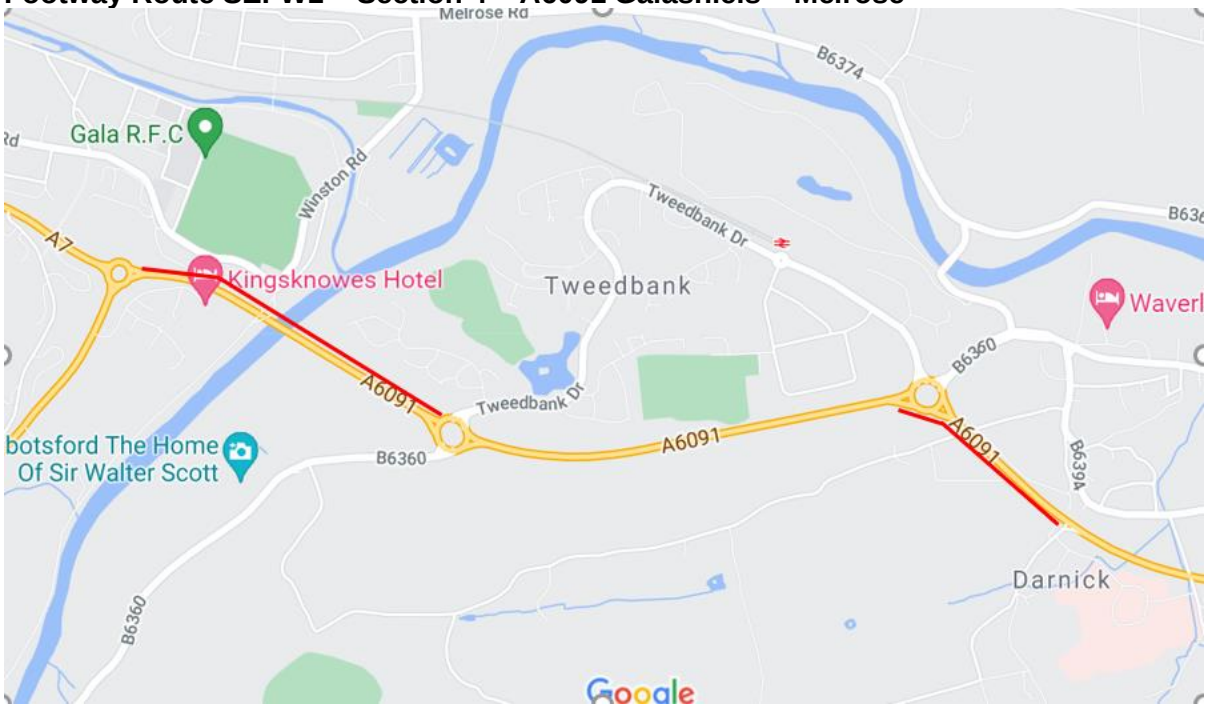
Name of Street	Side of street	Start	Finish	Route centreline length (m)
Buccleuch Road	Both	Langheugh Road	2nd easternmost entry into Hawick High School	40
Buccleuch Road	Both	2nd easternmost entry into Hawick High School	Buccleuch Place	90
Buccleuch Street	Both	Buccleuch Place	Sandbed Roundabout	225
Sandbed	Both	Sandbed Roundabout	Start of Albert Road	70
Albert Road	Both	End of Sandbed	Commercial Road	120
Commercial Road	Both	Albert Road	Bath Street	285
Commercial Road	West	Bath Street	Dovemount Place	415
Dovemount Place / Wiltonhill	Both	Commercial Road	Fire Station	535
Wiltonhill	West	Fire Station	Rose Cottage	385

Footway Route SEFW1 – Section 3 – A7 Selkirk



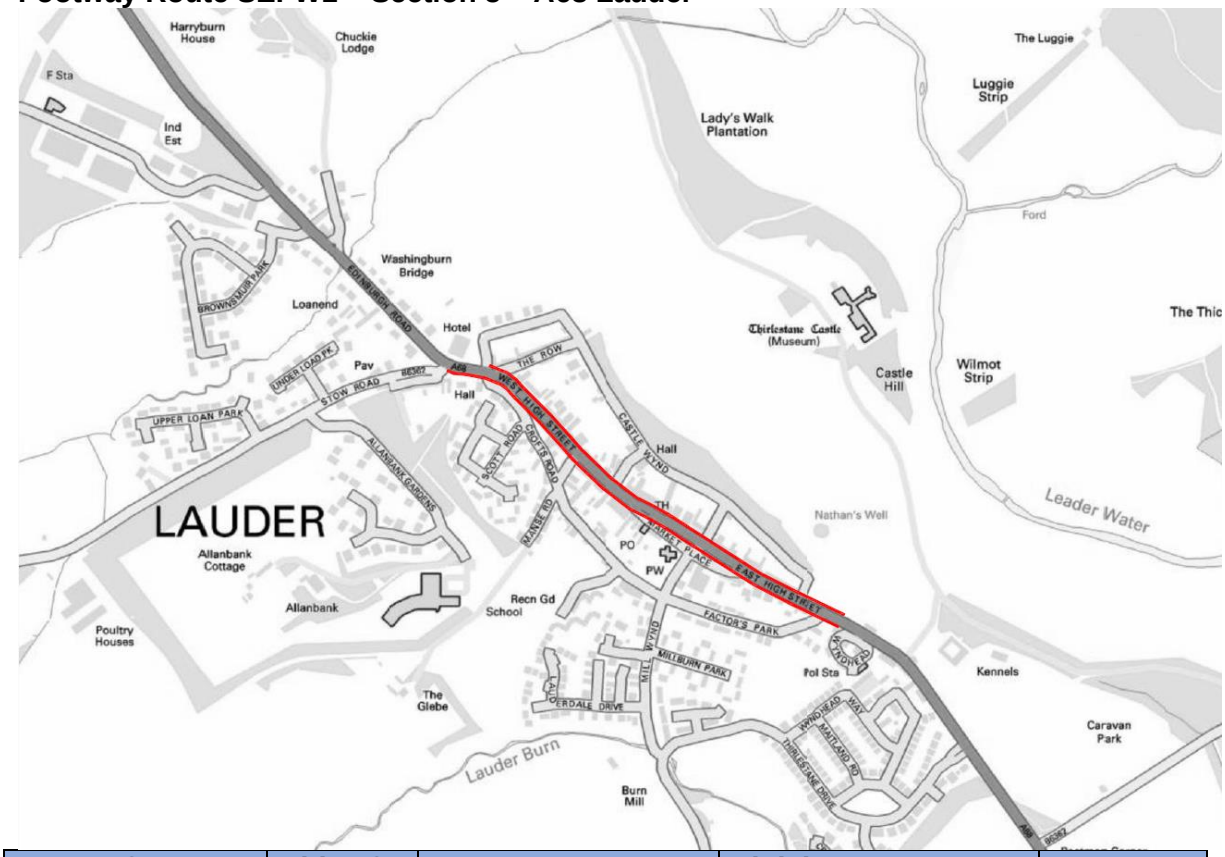
Name of Street	Side of street	Start	Finish	Route centreline length (m)
Hillside Terrace	Both	Tennis Courts	High School Lane	150
Hillside Terrace	North	High School Lane	(11048/60/65)	165
Hillside Terrace	South	High School Lane	(11048/60/65)	155
Hillside Terrace/Tower	Both	(11048/60/65)	Back Row	220
Tower Street	Both	Back Row	High Street	115
High Street	Both	Tower Street	Ettrick Terrace	80
Ettrick Terrace	Both	High Street	Chapel	105
Ettrick Terrace	Both	Chapel Street	Entrance into factory	1280

Footway Route SEFW1 – Section 4 – A6091 Galashiels – Melrose



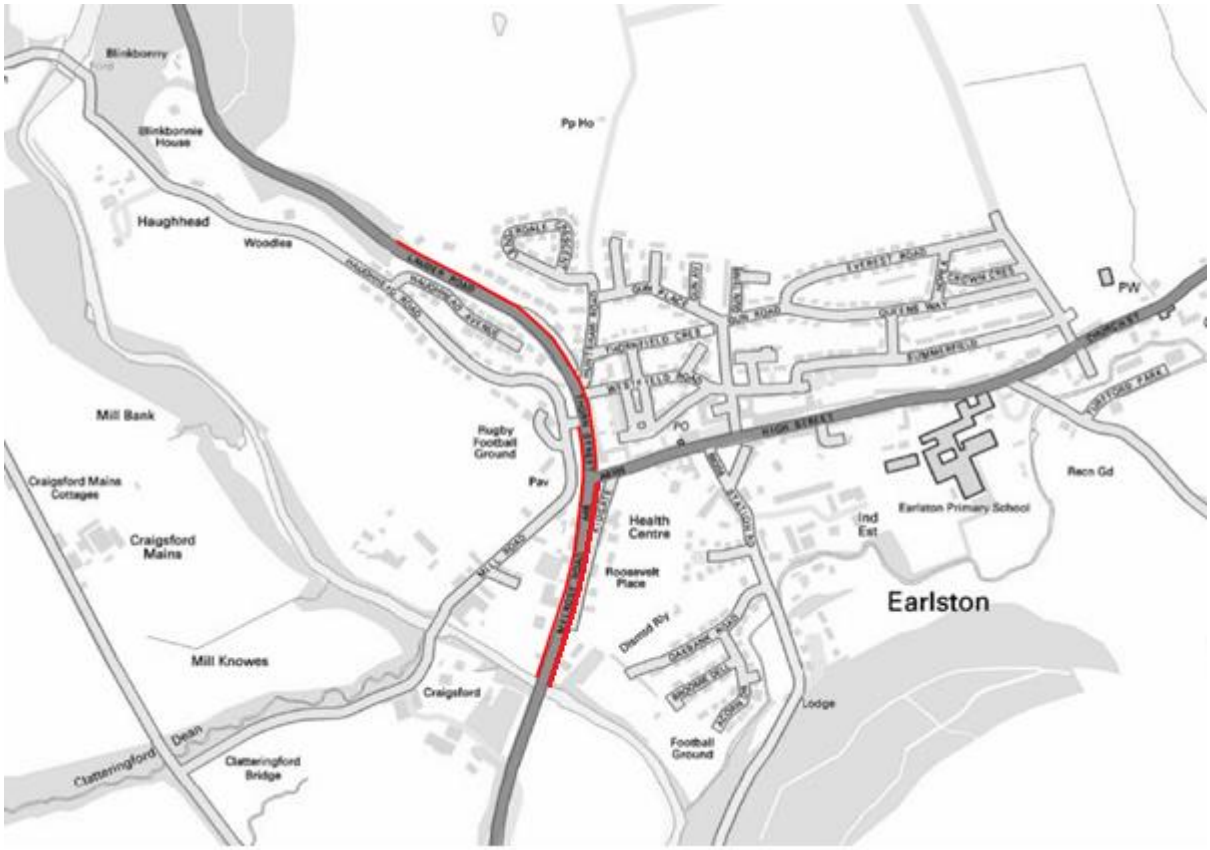
Name of Street	Side of street	Start	Finish	Route centreline length (m)
A6091	North	Tweedbank Roundabout	Kingsknowe Roundabout	983
A6091	South	Melrose Roundabout (B6360 Junc)	Junction Borders General Hospital	620

Footway Route SEFW1 – Section 5 – A68 Lauder



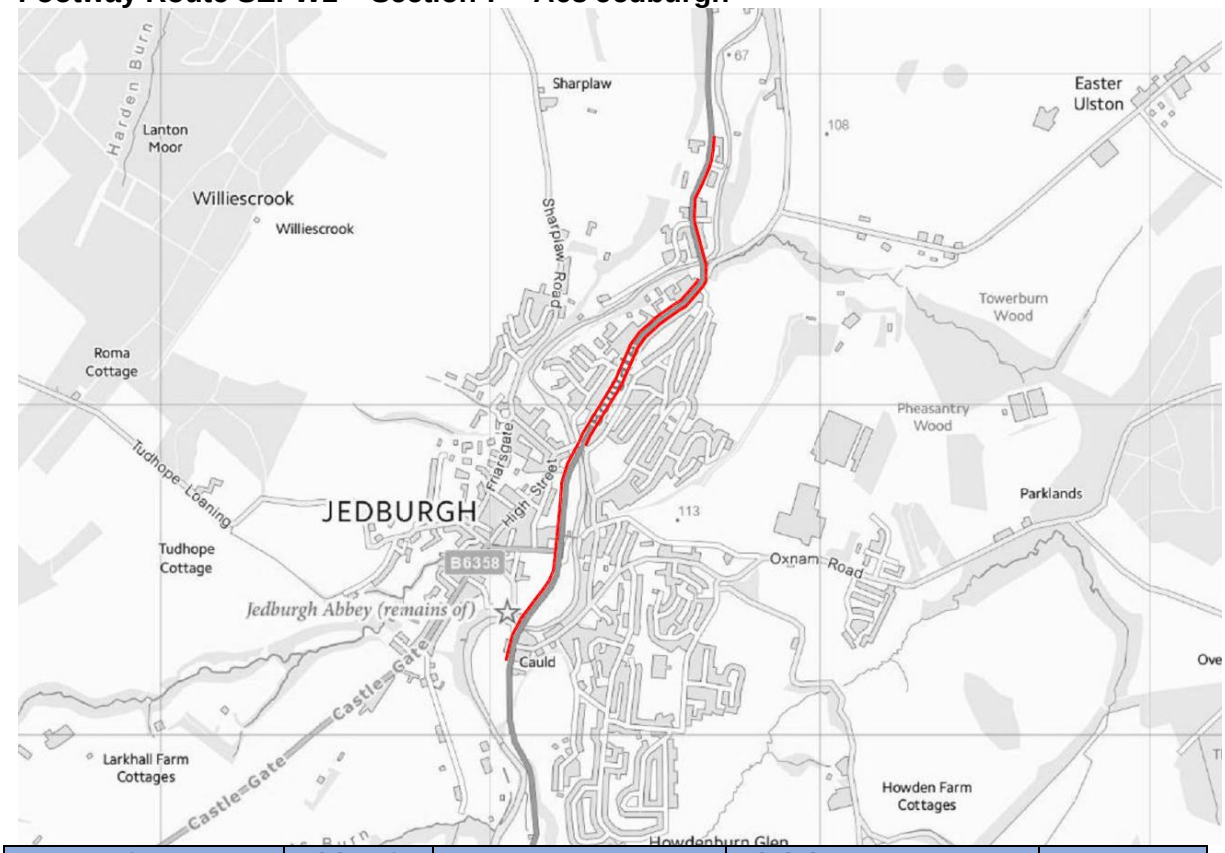
Name of Street	Side of street	Start	Finish	Route centreline length (m)
High Street (East and West)	Both	Wyndhead Lodge (13053/05/370)	The Haven (13055/05/115)	1230

Footway Route SEFW1 – Section 6 – A68 Earlston



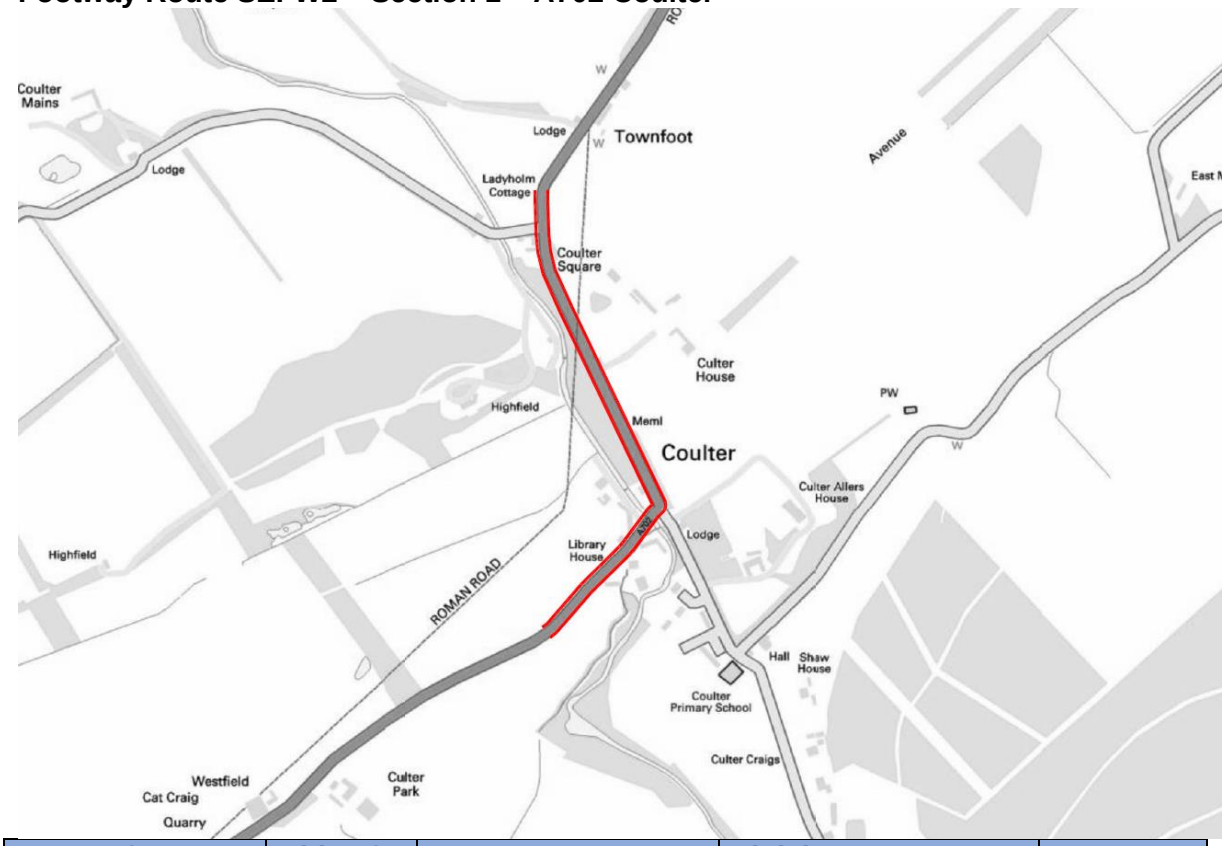
Name of Street	Side of street	Start	Finish	Route centreline length (m)
Melrose Road	West	Leader Cottage (13025/74/1060)	Kirkgate Cottage (13025/74/1220)	160
Melrose Road/Thorn Street	Both	Kirkgate Cottage (13025/74/1220)	Westfield Road	215
Lauder Road	East	End of divided section of road (13041/05/280)	Otford House (13041/05/440)	160

Footway Route SEFW1 – Section 7 – A68 Jedburgh



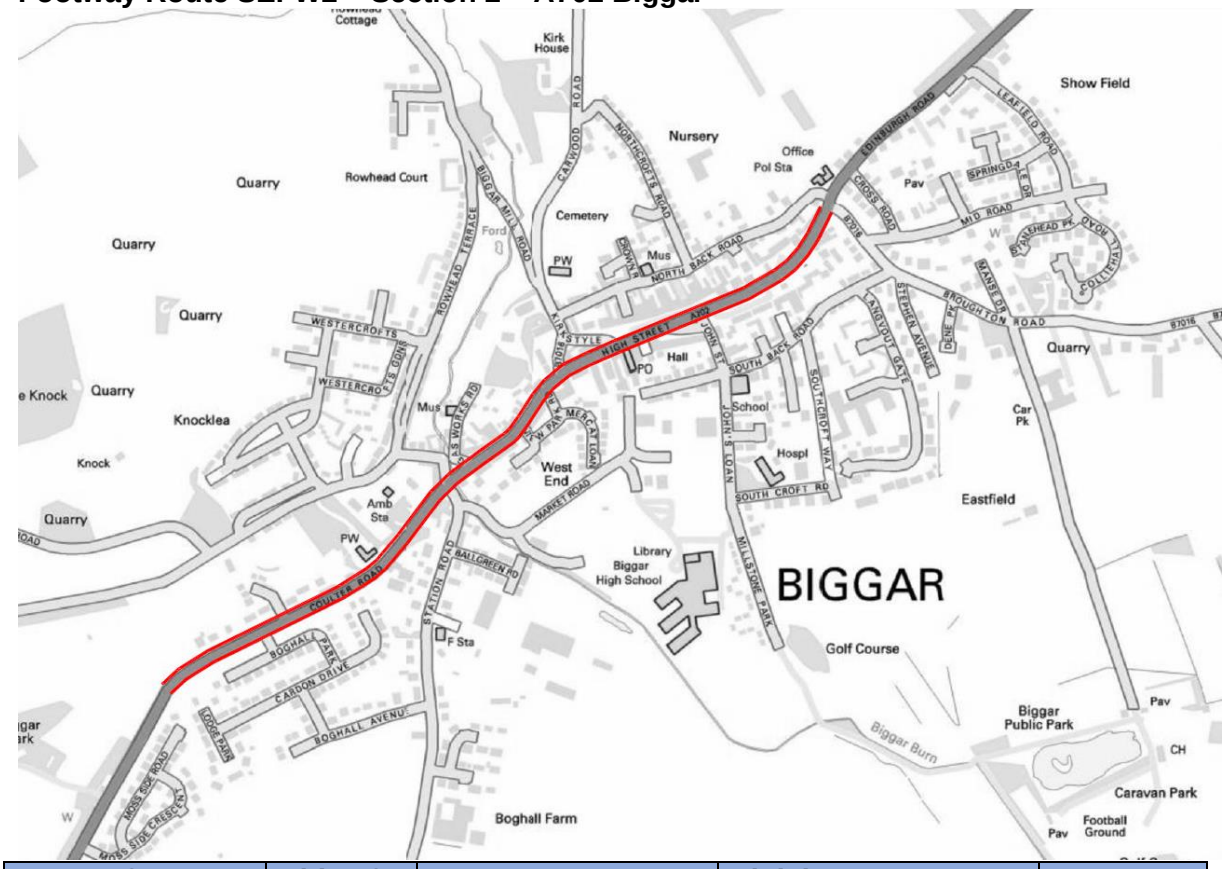
Name of Street	Side of street	Start	Finish	Route centreline length (m)
Newcastle Road	West	Oxnam Road	Front of Queen Mary's Building	515
Bongate/Edinburgh Road	Both	Front of Queen Mary's Building	Riverside Workshops	900
Edinburgh Road	East	Front of Queen Mary's Building	200 metres north of Queen Mary's Building	200

Footway Route SEFW2 – Section 1 – A702 Coulter



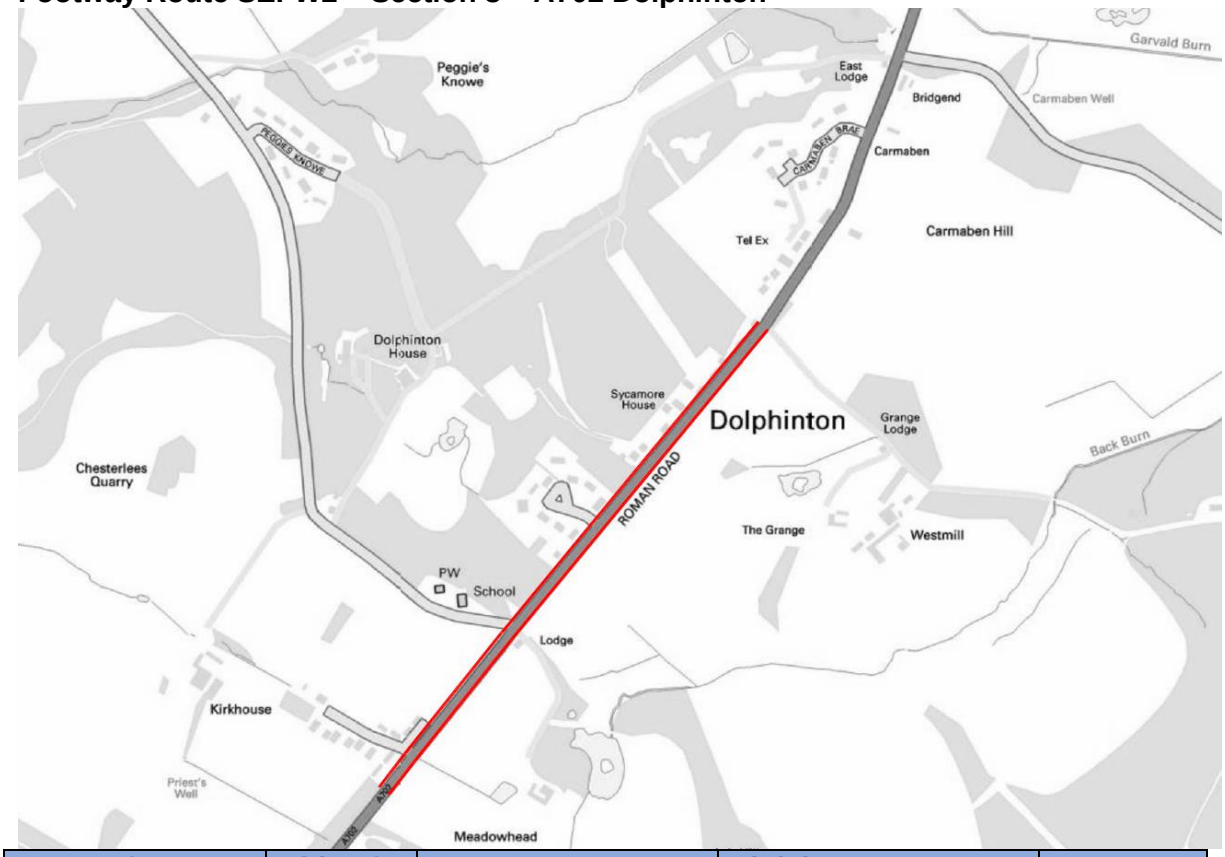
Name of Street	Side of street	Start	Finish	Route centreline length (m)
A702	Both	Bend in road near PO (13501/80/00)	Brae Cottage (1350/80/720)	720

Footway Route SEFW2 – Section 2 – A702 BIggar



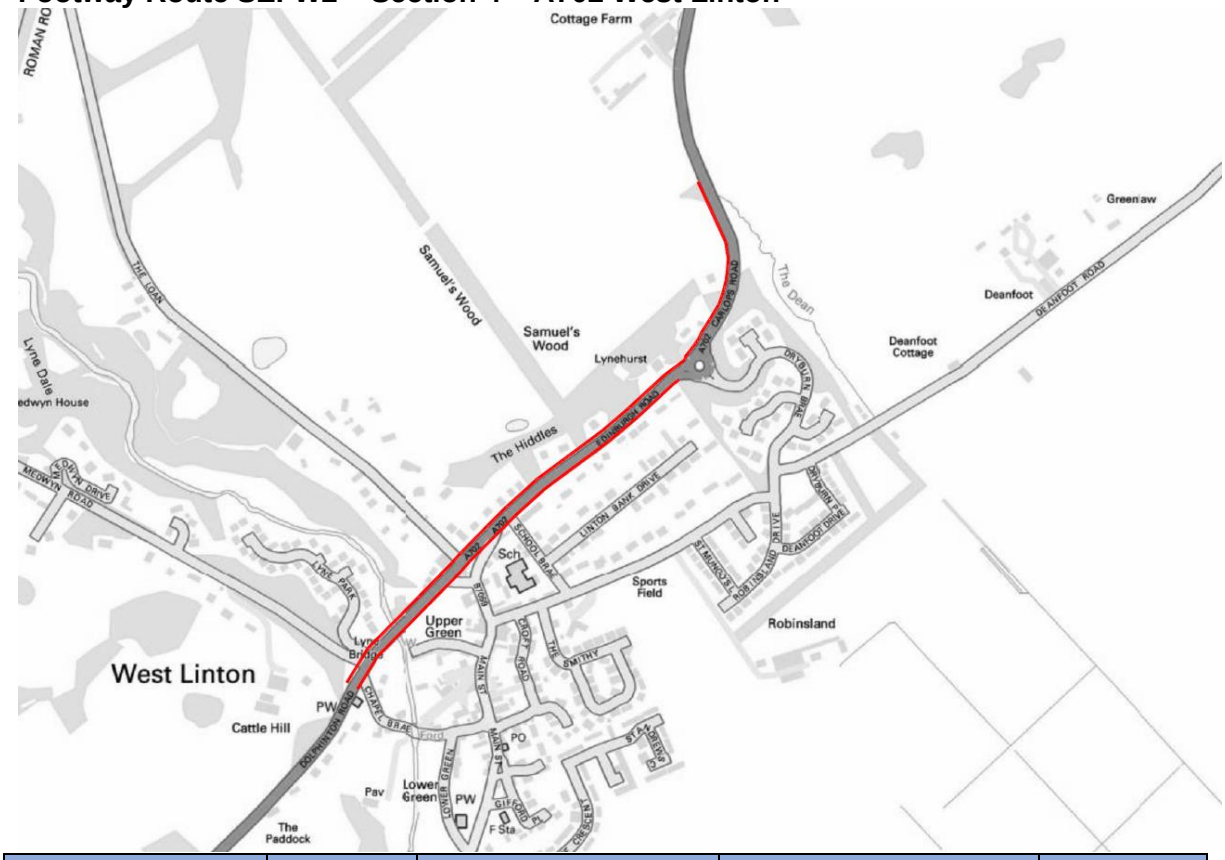
Name of Street	Side of street	Start	Finish	Route centreline length (m)
A702	Both	20 Coulter Road (13511/05/645)	Springdale (13511/05/2238)	1535

Footway Route SEFW2 – Section 3 – A702 Dolphinton



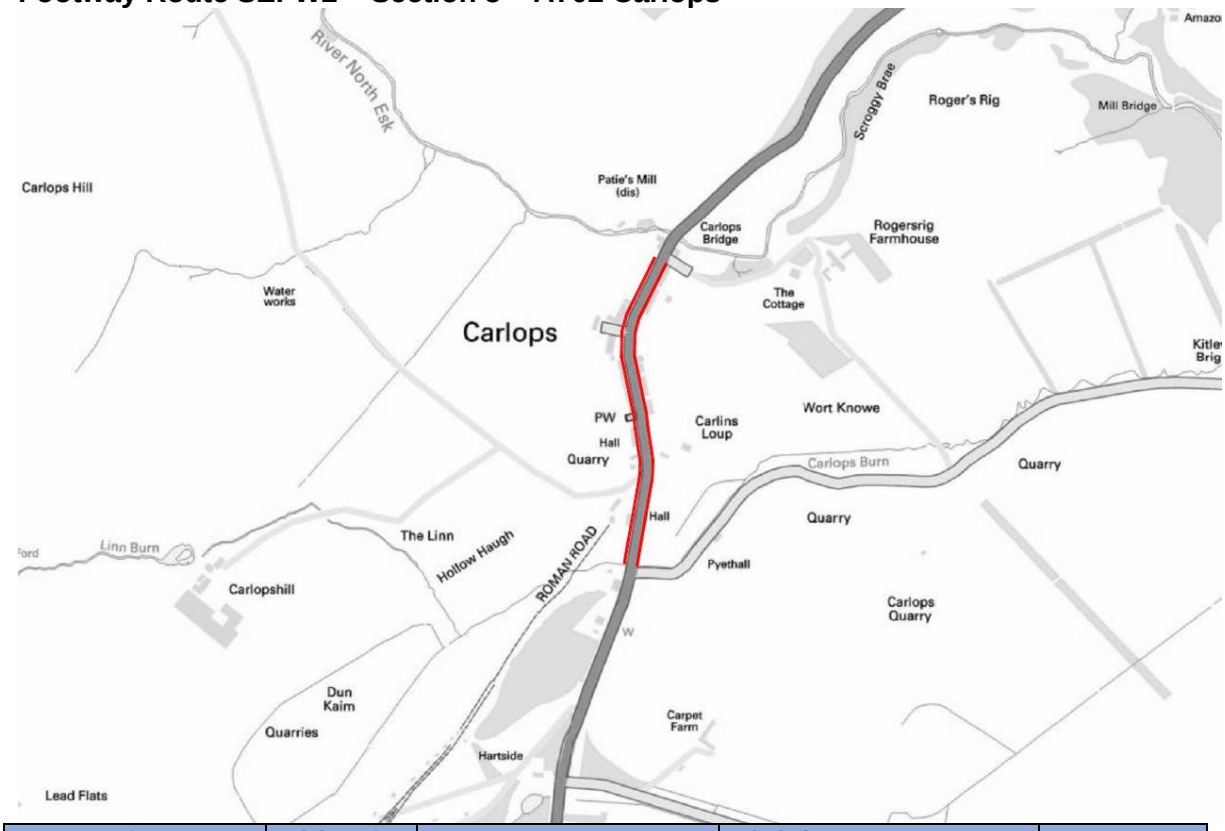
Name of Street	Side of street	Start	Finish	Route centreline length (m)
A702	Both	Hillside Gardens	Bend near the Beehive (13525/63/1060)	1040

Footway Route SEFW2 – Section 4 – A702 West Linton



Name of Street	Side of street	Start	Finish	Route centreline length (m)
Dolphinton Road/Carlops Road	Both	The Paddock (13531/05/5855)	Roundabout	960
Carlops Road	West	Roundabout	Linton Grange (13533/79/165)	220

Footway Route SEFW2 – Section 5 – A702 Carlops

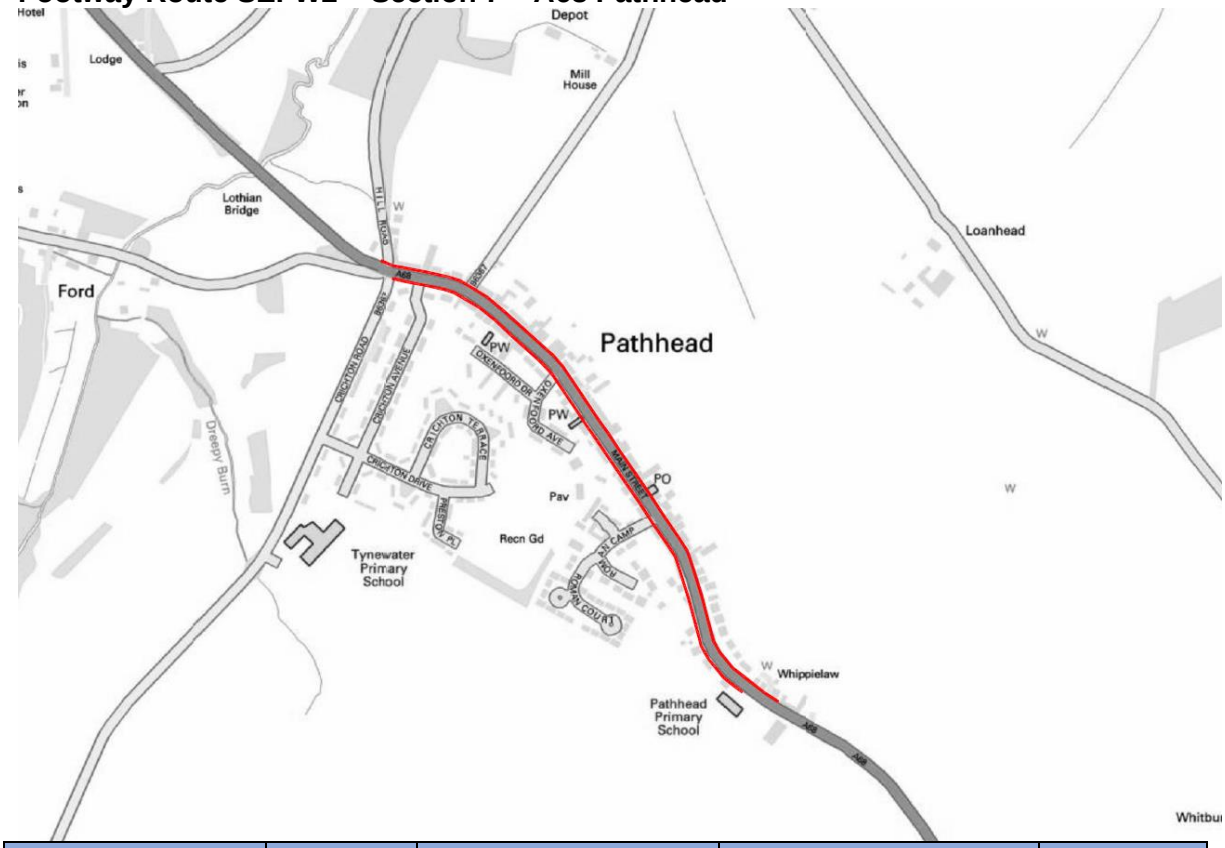


Name of Street	Side of street	Start	Finish	Route centreline length (m)
A702	Both	Old Manse (13535/05/240)	The Cottage (13535/05/860)	620

Footway Route SEFW2 – Section 6 – A702 Silverburn

Name of Street	Side of street	Start	Finish	Route centreline length (m)
A702	Both	60 metres southwest of Hopelands Road	210 metres northeast of Hopelands Road	270

Footway Route SEFW2 – Section 7 – A68 Pathhead

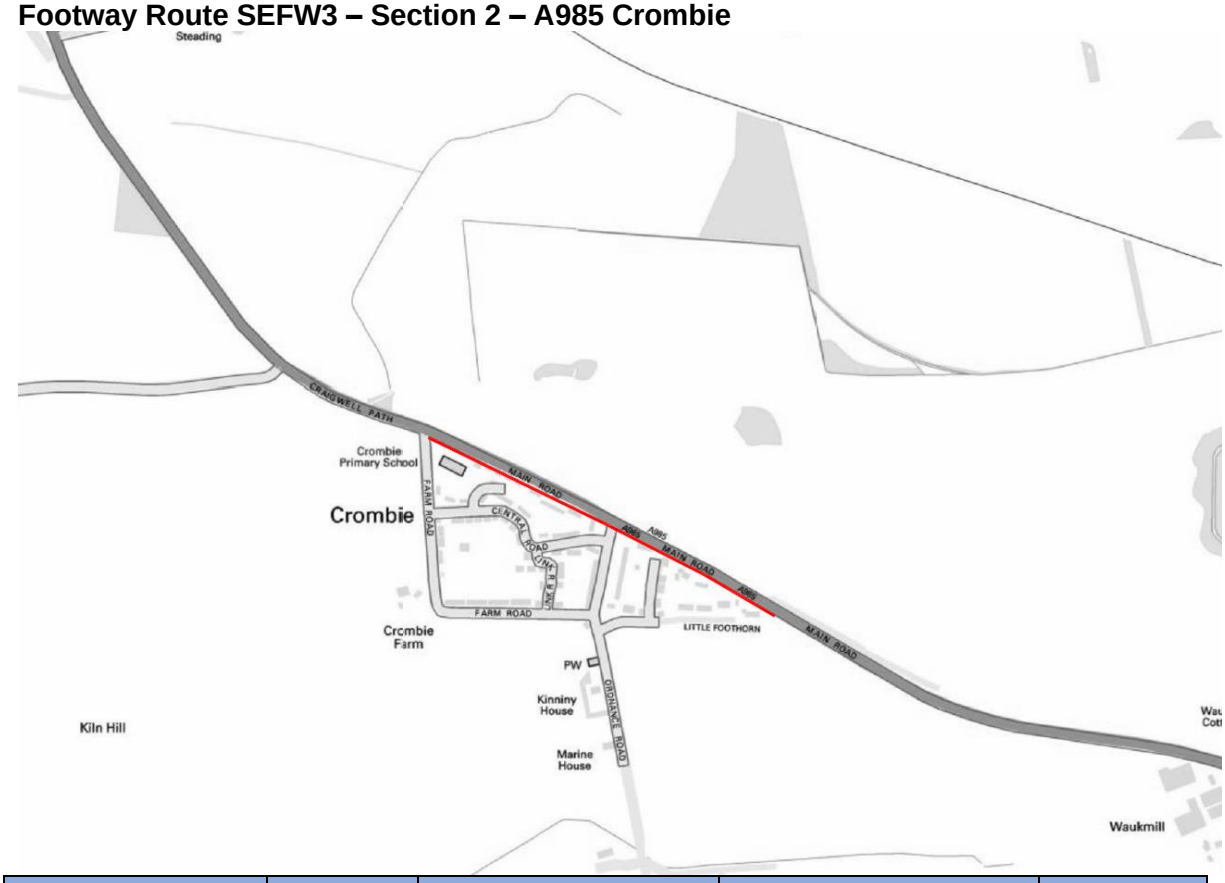


Name of Street	Side of street	Start	Finish	Route centreline length (m)
A68	Both	Whippielaw (13074/64/1110)	Crichton Road Junction	945

Footway Route SEFW3 – Section 1 – A977 Kincardine

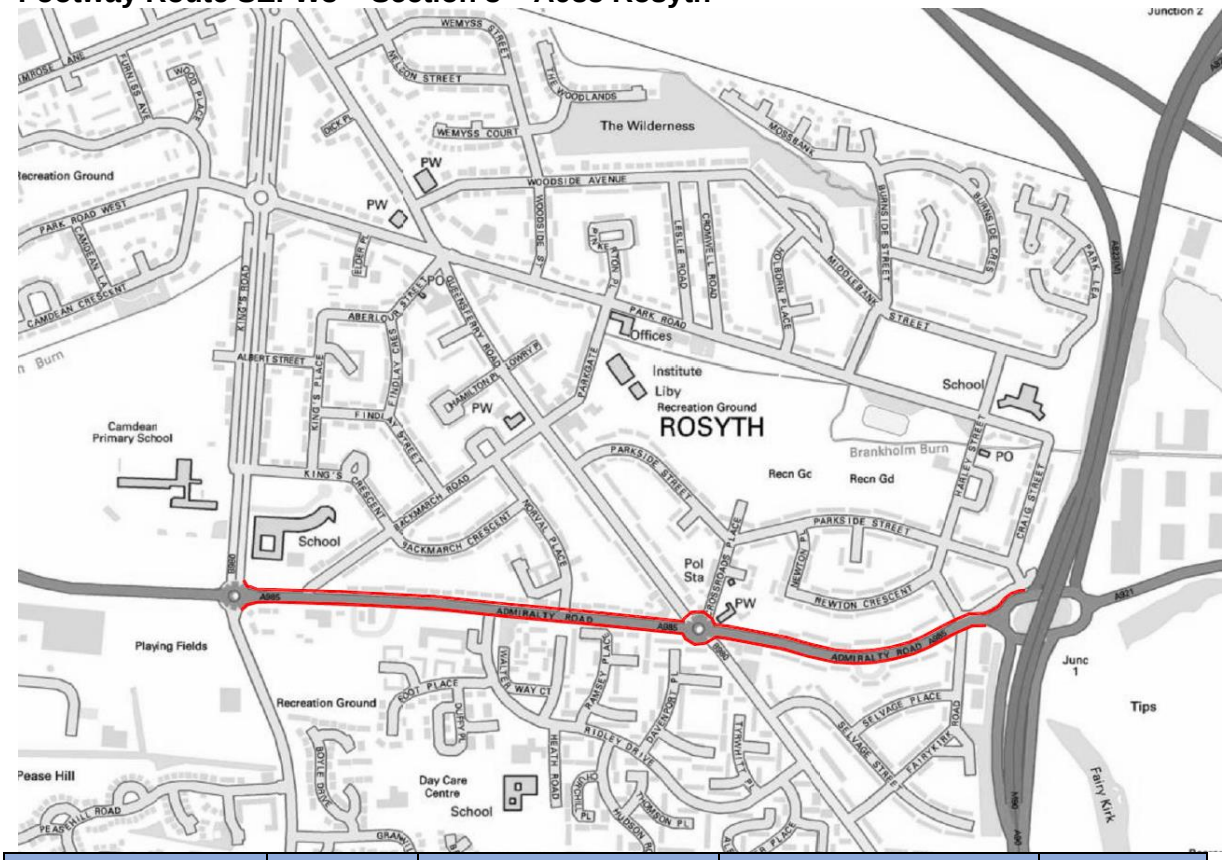
Name of Street	Side of street	Start	Finish	Route centreline length (m)
A977 Feregait/ Toll Road	Both	Broomsknowe Drive	Easter Kincardine (15902/05/365)	2120

Footway Route SEFW3 – Section 2 – A985 Crombie



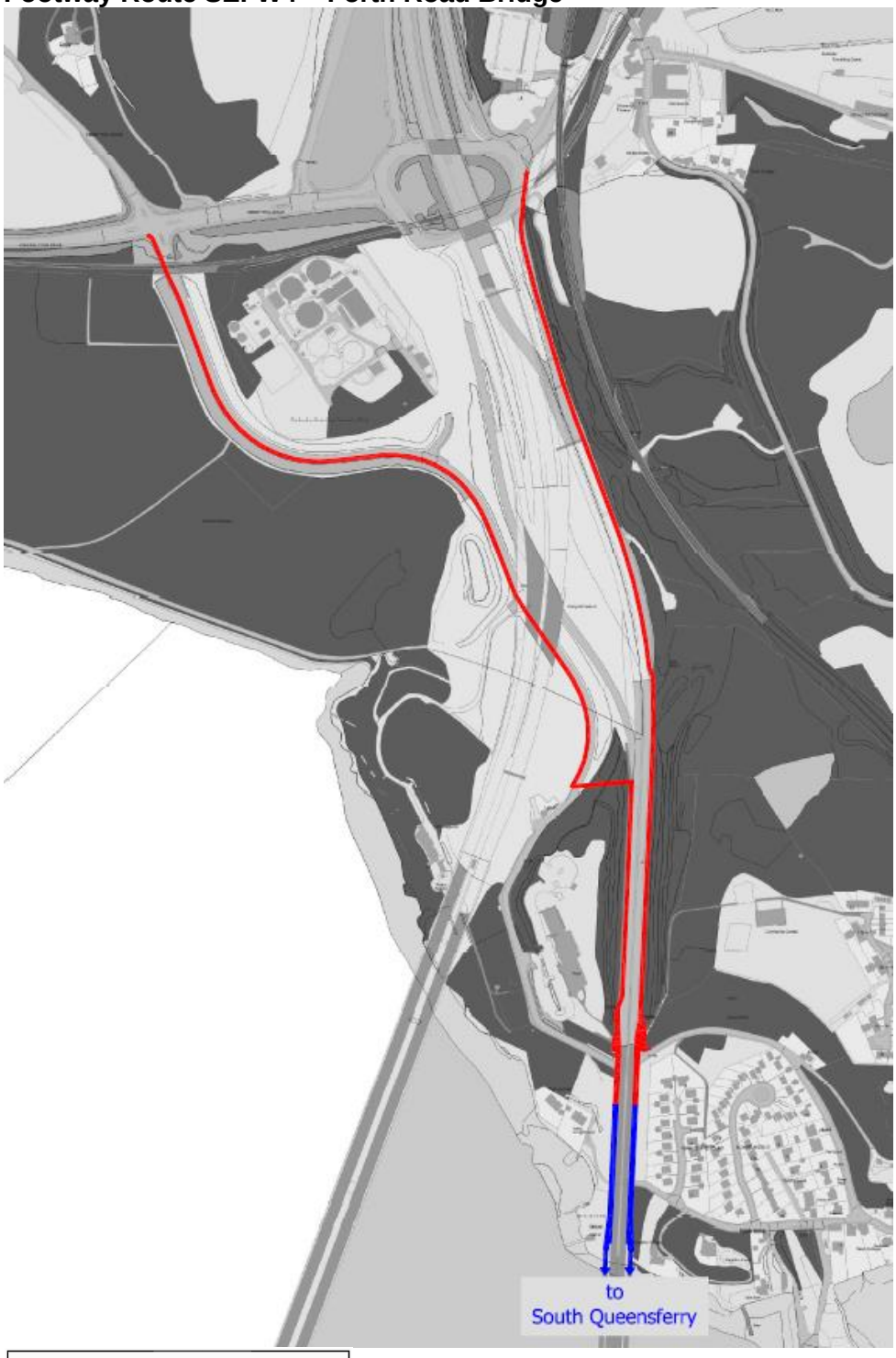
Name of Street	Side of street	Start	Finish	Route centreline length (m)
Main Road	South	Farm Road (14620/18/240)	(14620/18/900)	660

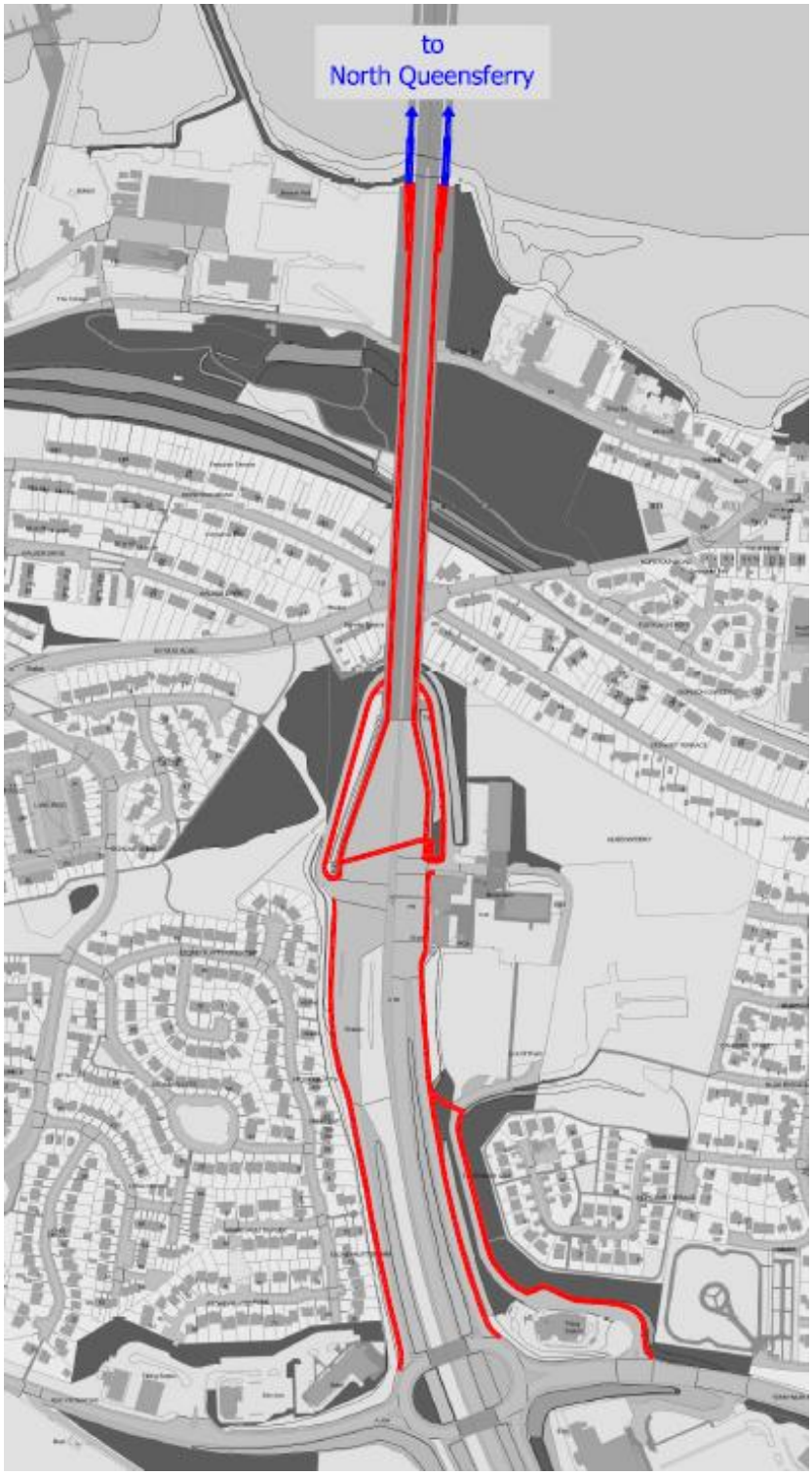
Footway Route SEFW3 – Section 3 – A985 Rosyth



Location	Side of street	Start	Finish	Route centreline length (m)
Admiralty Road	Both	King's Road	M90 Admiralty Junction slip road	1220

Footway Route SEFW4 – Forth Road Bridge





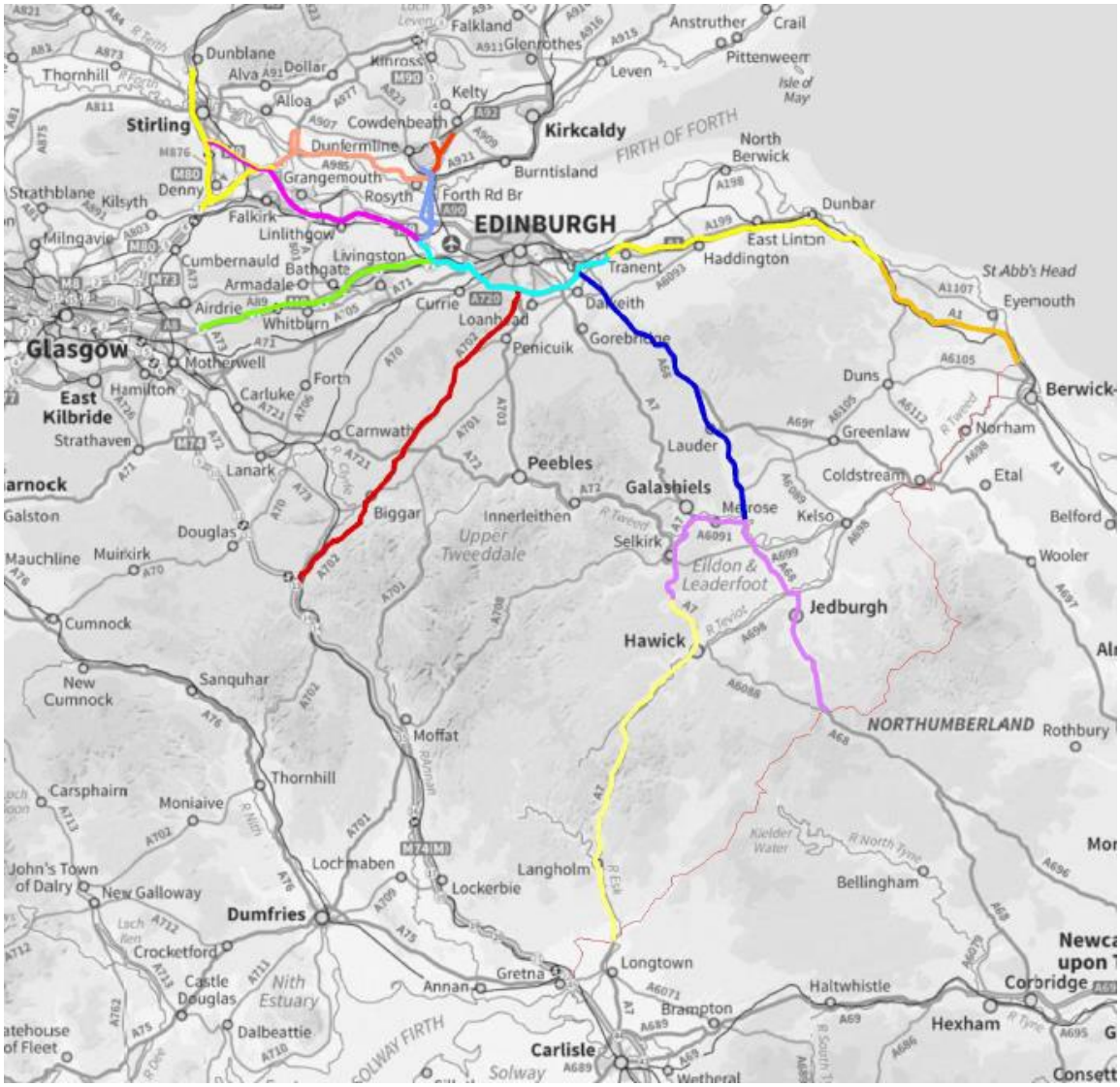
Treatment Type
Brine
Potassium Acetate

Route	Location	Comments	Start	Finish	Route centreline length (m)
A9000	Plaza	Southbound	Forth Road Bridge	Echline Roundabout	360
A9000	Echline	Northbound	Echline Roundabout	Plaza	230
A9000	Echline	Northbound	Plaza	Forth Road Bridge	170
A9000	Forth Road Bridge	Northbound	Southside	Northside	2500
A9000	Welldean	Northbound	North End of Bridge	End of Slip Road at Ferrytoll Roundabout	950
A9000	Ferrytoll Roundabout	Roundabout Section			220
A9000	Ferrytoll	Southbound	Ferrytoll Onslip	North End of Bridge	850
A9000	Forth Road Bridge	Southbound	Northside	Southside	2500
A9000	Old Plaza	Southbound	South End of Bridge	Old Plaza	200
A9000	Old Plaza	Steps for South Underpass and Underpass			40
A9000	North Queensferry	Steps for North Abutment			30
A9000	Car Park	Ramp and steps from Car Park to Old Plaza			15
A9000	Echline	Link Path from A9000	Ferrymuir Gait		10
A9000	Forth Road Bridge Compound	Car Park Area	Viewing Area including Office Entrance		30
A9000	Forth Road Bridge Compound	Footpath adjacent to Service Road	South Abutment		300
A9000	Ferrymuir Gait	Access Road	Ferrymuir Road	Forth Road Bridge Car Park	375
A9000	Car Park Area	(Treated by spreader)			

Appendix WSP3 – Patrol Routes – Table and Map

Appendix WSP3 Category A and B Patrol Routes

Key	Patrol Category (A or B)	Depot	Route	Description	Depot to Route (km)	Time to route (min)	Patrol Length (km)	Average Speed (kph)	Route Time (min)	Route to Depot (km)
	A1	Bonnyrigg	A1	Cockburnspath R/A to National Boundary and return	57.6	45	56	64	55	57.6
	A2	Bonnyrigg	A1	Tranent east junction to Cockburnspath R/A and return	17	13	78	80	59	17
	A3	Bonnyrigg	A1/ A720/ M8	Tranent east junc, Sherrifhall, Hermiston, Newbridge R/A and return	6.4	6	70	70	60	6.4
	A4	Burghmuir	M9/ M8	M9 Newbridge R/A to Shotts (M8 DBFO) and return to Newbridge R/A	13	10	70	80	53	13
	A5	Burghmuir	M9	M9 J3 - M9 J9 Pirnhall R/A - M9 Newbridge R/A amd return M9 J3	0.2	1	82	80	60	0.2
	A6	Chryston	M80/ M9/ M876	M876 Bowtrees R/A - M80 J7 - M9J11 - M80 J7 - M876 Bowtrees R/A	15	11	70	80	52	15
	A7	Rosyth	M90/ A92	M90 Ferrytoll- M9 J1A via QC- M90 J3 via QC - M90 J2 - A92 Cowdenbeath return to M90 Ferrytoll	2.1	2	44	64	41	2.1
	A8	Rosyth	A90/ A9000/ M90/ A823(M)	M90 Ferrytoll - M823 Pitreavie R/A - A90 Dalmeny via FRB - M90 Ferrytoll via South Queensferry R/A and FRB	2.1	2	42	58	43	2.1
	B1	Rosyth	A977/ A876/ A985	A977 - A985 Kincardine Bridge - M876 Bowtrees R/A - A876 Clackmannanshire Bridge - A977 Gartarry R/A - A977 - A985 Rosyth at Ferrytoll R/A and return to start point	4.8	5	28	64	58	4.8
	B2	Bonnyrigg	A702	A702 Lothianburn Junction - M74 Abington and return	13.5	12	116	55	126	13.5
	B3	Bonnyrigg	A68	A68 Millerhill - A68 Ravenswood R/A and return	8.3	9	96	55	105	8.3
	B4	Charlesfield	A68/ A6091/ A7	A68 Charlesfield Junction - Carter Bar - A6091 Ravenswood - A7 Kingsknowe - A7 Ashkirk and return to A68 Charlsefield Junction	1	2	112	55	122	1
	B5	Charlesfield	A7	A7 Ashkirk - A7 National Boundary and return	20	22	122	55	133	20


EDINBURGH
Glasgow
Stirling
Kirkcaldy
Dumfries
Carlisle
Hawick
Jedburgh
Peebles
Galashiels
Lauder
Melrose
Kelso
Coldstream
Berwick-
Dunbar
Haddington
Tranent
Dalkeith
Penicuik
Livingston
Falkirk
Grangemouth
Dunfermline
Cowdenbeath
Burntisland
Leven
Anstruther
Crail
Pittenweem
Isle of May
FIRTH OF FORTH
North Berwick
Eyemouth
St Abb's Head
Duns
Greenlaw
Norham
Etal
Belford
Wooler
Rothbury
NORTHUMBERLAND
Bellingham
Hexham
Haltwhistle
Brampton
Longtown
Gretna
Annan
Lockerbie
Langholm
Moffat
Thornhill
Sanquhar
New Cumnock
Cumnock
Douglas
Biggar
Carnwath
Forth
Carluke
Hamilton
East Kilbride
Strathaven
Lanark
Motherwell
Airdrie
Whitburn
Armadale
Bathgate
Cumbernauld
Linlithgow
Falkirk
Rosyth
Forth Rd Br
Currie
Loanhead
Innerleithen
Upper Tweeddale
Selkirk
Eildon & Leaderfoot
Wooler
Alnwick
Corbridge
Newcastle upon Tyne
Consett
Wetheral
Solway
Solway Firth
Nith Estuary
Dalbeattie
Castle Douglas
Crocketford
New Galloway
John's Town of Dalry
Carsphairn
Moniaive
Lochmaben
Mauchline
Muirkirk
Galston
Arnock
Kilsyth
Denny
Milngavie
Strathblane
Dunblane
Alva
Dollar
Thornhill
Alloa
Kelty
Kinross
Glenrothes
Falkland
Pittenweem
Tranent
Haddington
East Linton
Dunbar
Berwick-upon-Tweed
Tweed
Teviot
Kielder Water
North Tyne
Tyne
Rede
Ettrick Water
Yarrow
Ale Water
Whiteadder Water
Leet Water
Annan
Esk
Nith
Ayr
Irvine
Clyde
Tay
Earn
Devon
Forth
Allan Water
Teith
Gala Water
Leader Water
Eden Water
Blackadder Water
Whiteadder Water
Leet Water

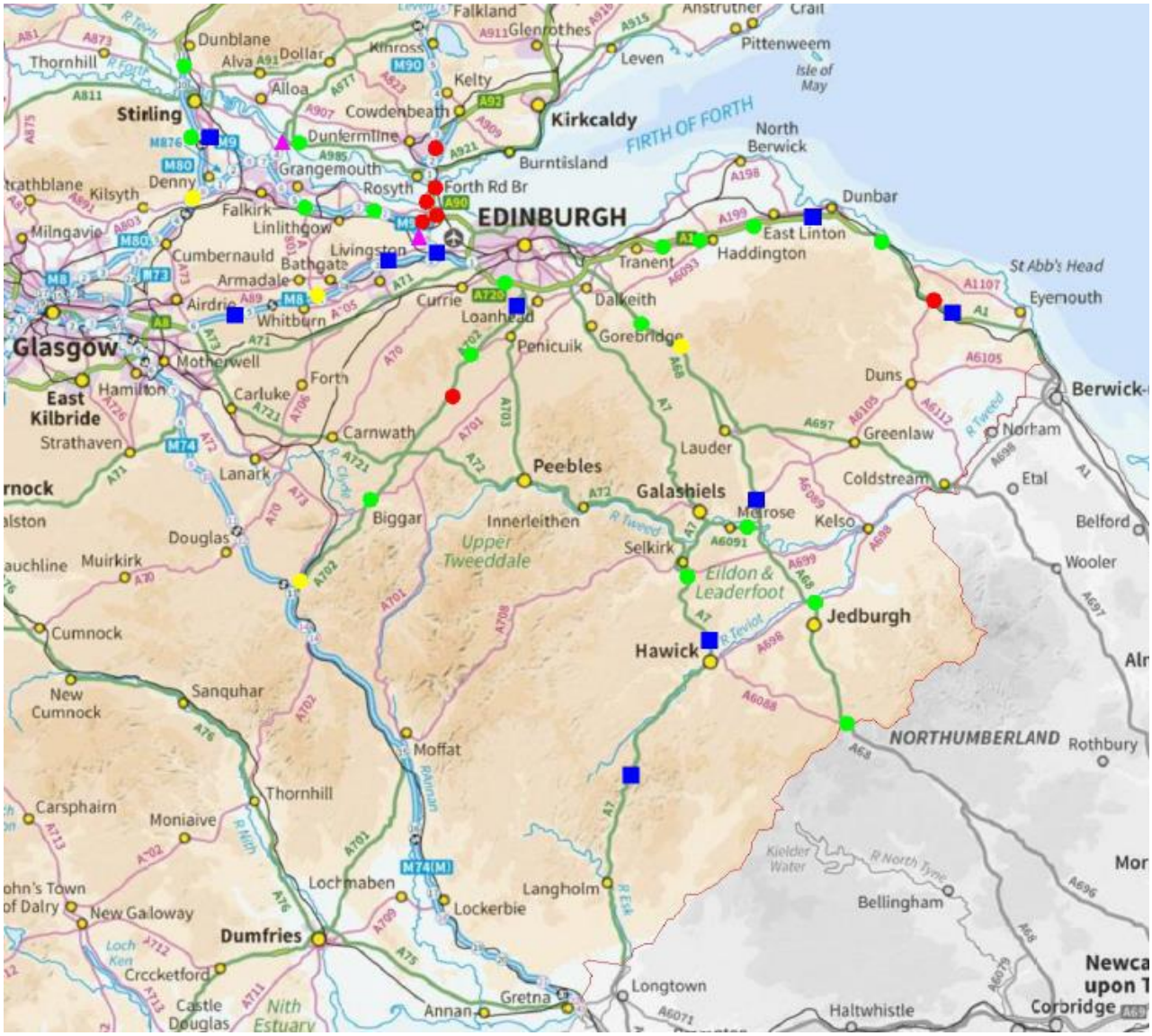
Appendix WSP4 – Location of Weather Stations and Cameras

Road Number	Location	Type	Altitude (m AOD)
A985	Kincardine (Eastern Link Road)	Findlay Irvine	15
M8	J3 Livingston	Vaisala	140
M8	**J4 Whitburn**	**Vaisala**	**160**
M8	Duntilland	Vaisala	250
M9	Newbridge	Findlay Irvine	50
M9	J2 to J1a (wind only)	Vaisala	50
M9	Linlithgow	Vaisala	63
M9	Polmont	Vaisala	30
M9	Bannockburn	Vaisala	70
M9	Kier	Vaisala	60
M80	Pirnhall	Vaisala	95
M80	**Haggs**	**Vaisala**	**90**
A876	Clackmannanshire Bridge (wind only)	Vaisala	20
A90	Dolphington Burn, Dalmeny	Vaisala	
A9000	Forth Road Bridge (NW)	Vaisala	
A9000	Forth Road Bridge (wind only)	Vaisala	40
M90	Dundas Farm Gantry 07	Vaisala	
M90	Queensferry Crossing Gantry 09 (camera site ONLY)	Vaisala	
M90	**Halbeath**	**Vaisala**	**120**
A1	Gladsmuir	Vaisala	100
A1	**Grantshouse**	**Vaisala**	**120**
A1	**Haddington**	**Vaisala**	**80**
A1	Myreside	Findlay Irvine	40

A1	Torness	Vaisala	10
A1	Tyne (East Linton)	Findlay Irvine	40
A1	Houndwood	Vaisala	70
A6091	Newstead	Vaisala	110
A68	Bonjedward	Vaisala	90
A68	Carter Bar	Vaisala	310
A68	Hope	Findlay Irvine	210
A68	**Soutra**	**Vaisala**	**340**
A68	Earlston	Vaisala	120
A7	Mosspaul	Findlay Irvine	260
A7	Selkirk	Findlay Irvine	230
A7	Hawick	Vaisala	120
A7	**Terrona**	**Vaisala**	**110**
A702	**Abington**	**Vaisala**	**228**
A702	Boghall	Vaisala	200
A702	Biggar (Causewayend)	Vaisala	105
A702	Nine Mile Burn	Vaisala	276
A702	**West Linton**	**Vaisala**	**240**
A720	Swanston	Vaisala	160

Forecasting Road Weather Stations are shown in **bold**.

Appendix WSP4 – Location of Weather Stations and Cameras (Map)



Legend

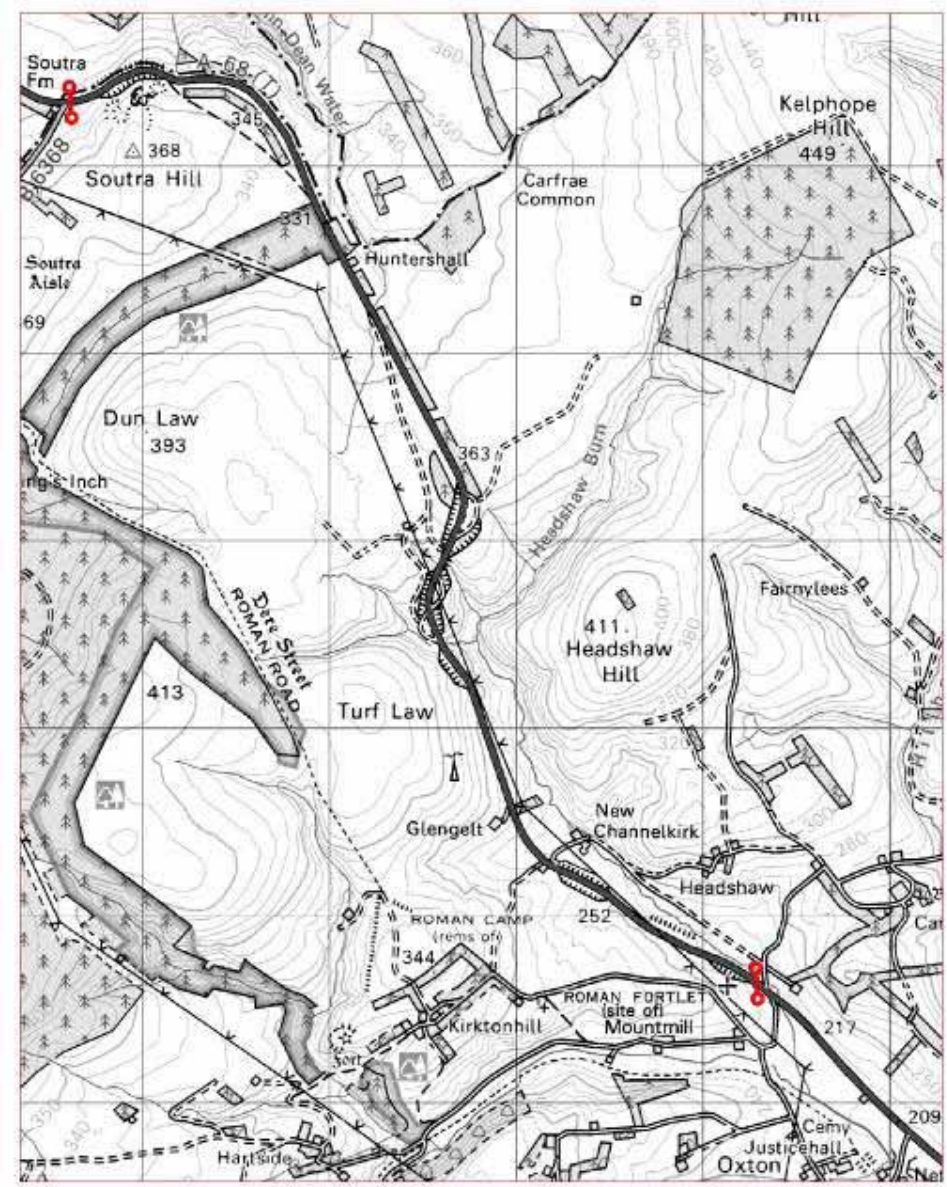
SE Weather Stations

- Forecast site
- Forecast and Camera
- Standard site with Camera
- Standard site
- Wind Only site

Appendix WSP5 – Location of Winter Service Infrastructure – Snow Gates

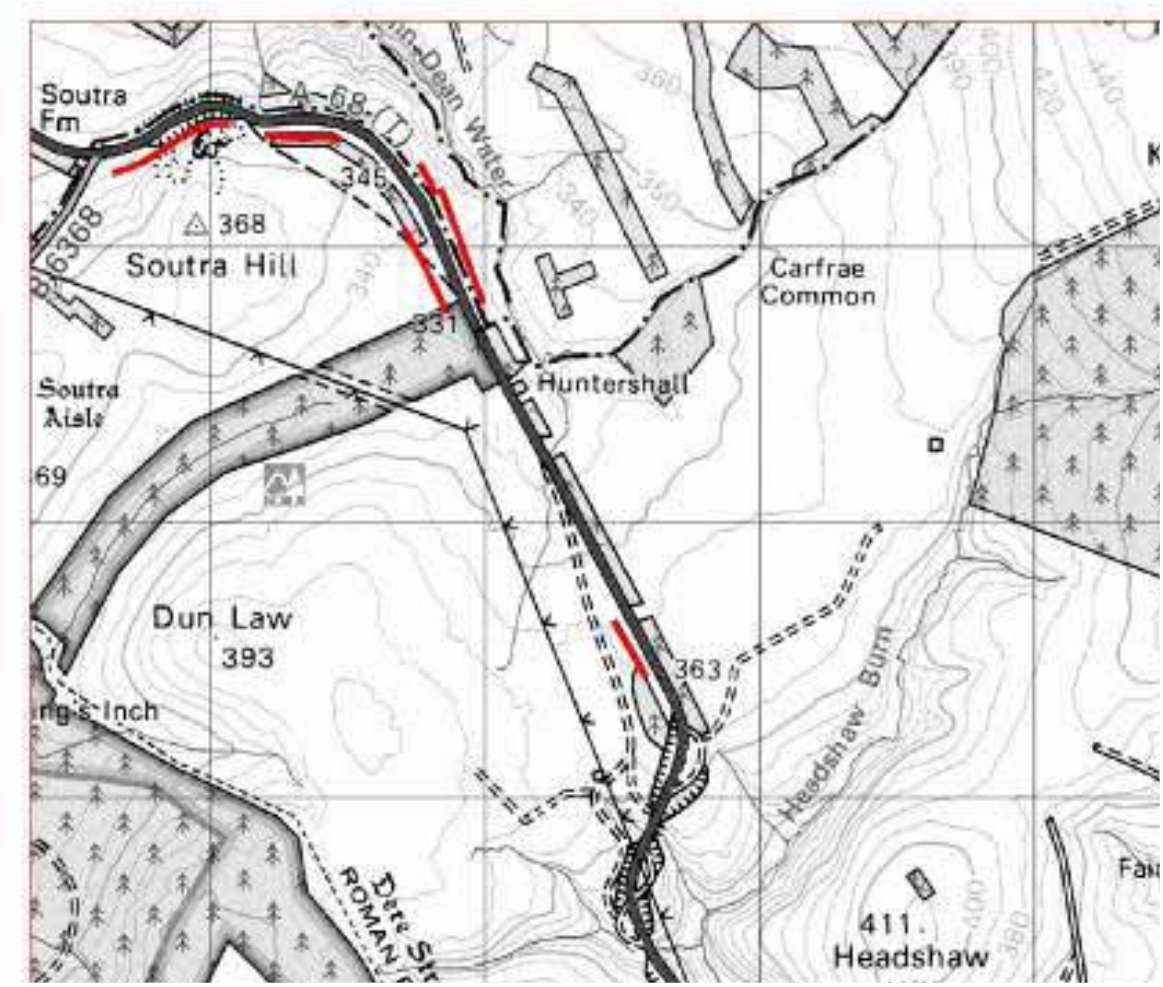
There is one set of snow gates on the network on either side of Soutra Hill. The metal double gates are hinged on either verge, padlocked open parallel to the c/w, when closed they meet on the centreline of the c/w and are padlocked closed. The map below shows the location

- Soutra Hill – at Soutra Mains Cottage
- Soutra Hill – North of Oxton Junction



Appendix WSP6 – Location of Winter Service Infrastructure – Snow Fences

Snow fencing has been installed on only one section of the network - A68 at Soutra. The map below identifies the fences in red. These will be inspected prior to 1 October and any maintenance work carried out. The fences will also be inspected following significant snow events for maintenance purposes and to consider if additional fencing is required. Any new fencing will be designed as per TRRL Report 362



Appendix WSP7 – Location of Winter Service Infrastructure – Snow and Ice Folding Message Signs

Road	Location	Detailed description of location
A7	South of Teviothead	At end of widened carriageway
A7	Hawick	Buccleuch Street
A7	Hawick	Burn Foot
A7	Galashiels Kingsknowes Roundabout	Facing west on Eastbound approach
A7	Selkirk Ladylands	Laylands Junction with A699
A7	Hawick	Junction with B6359
A689	Cleekim	Junction with A68 / A689 facing West
A68	Cleekim	50m North of A68 / A689 facing North
A68	Cleekim	Junction with A68 / A689 facing North
A68	Soutra Hill	Northbound Snow gates
A68	Soutra Hill	Southbound Snow gates
A68	Edgerton	Southbound layby
A68	Jedburgh	Oxnam road end, Abbey Bridge
A68	Jedburgh	Bonjedward southern end of triangle (A68) Northbound
A68	Jedburgh	Bonjedward southern end of triangle (A68) Southbound
A68	St Boswells	A68 / A699 crossroads
A68	Carfraemill	Southbound at roundabout
A68	Lauder	A68 / A697 at High Cross
A702	Dolphinton	Southbound between layby and 40 mph sign
A702	Dolphinton	Northbound between layby and 40 mph sign
A702	Carlops	Northbound at 30mph sign on southside
A702	Carlops	Southbound at 30mph sign on southside

Appendix WSP8 – Location of Winter Service Infrastructure – Salt Bins

A number of salt bins are required on the network and we intend to continue using existing locations at present. This will be updated and reviewed at the end of each winter season.

These will be stocked by 30 September each year and stock levels monitored and replenished as required throughout the period. At the end of each winter season salt bins will be taken back to depots and stored.

Salt Bins
A68 at junction with Frostineb Road
A68 outside Primary School, Pathhead
A68 Pathhead Medical Centre
A68 near Hundalee
A702 at Lothianburn Golf Club
A702 at Wallstone near A766 junction
A702 at Braidwood
A702 at Castlelaw Road
A702 outside No. 2 Biggar Road, Silverburn
A702 at junction with UC95, Ninemileburn
A702 at Beechwood Tea Rooms, Dolphinton
A702 at Townfoot, Coulter
A702 at Birthwood Road, Coulter
A702 at Lamington crossroads
A702 at Clanalba House, Lamington
A702 at Post Office, Lamington
A702 Causewayend
North side of Forth Road Bridge (see map below) – one NB, one SB
South side of Forth Road Bridge (see map below) – 13 No.

Self Help Salt Bins
A702 Carlops - One at North end, one at car park
A68 Earlston - Two on main road
A7 Newmill – Two on main road

Salt Heaps
None

Salt Bin Locations (North side of Forth Road Bridge)

Salt Bin Locations (South side of Forth Road Bridge)

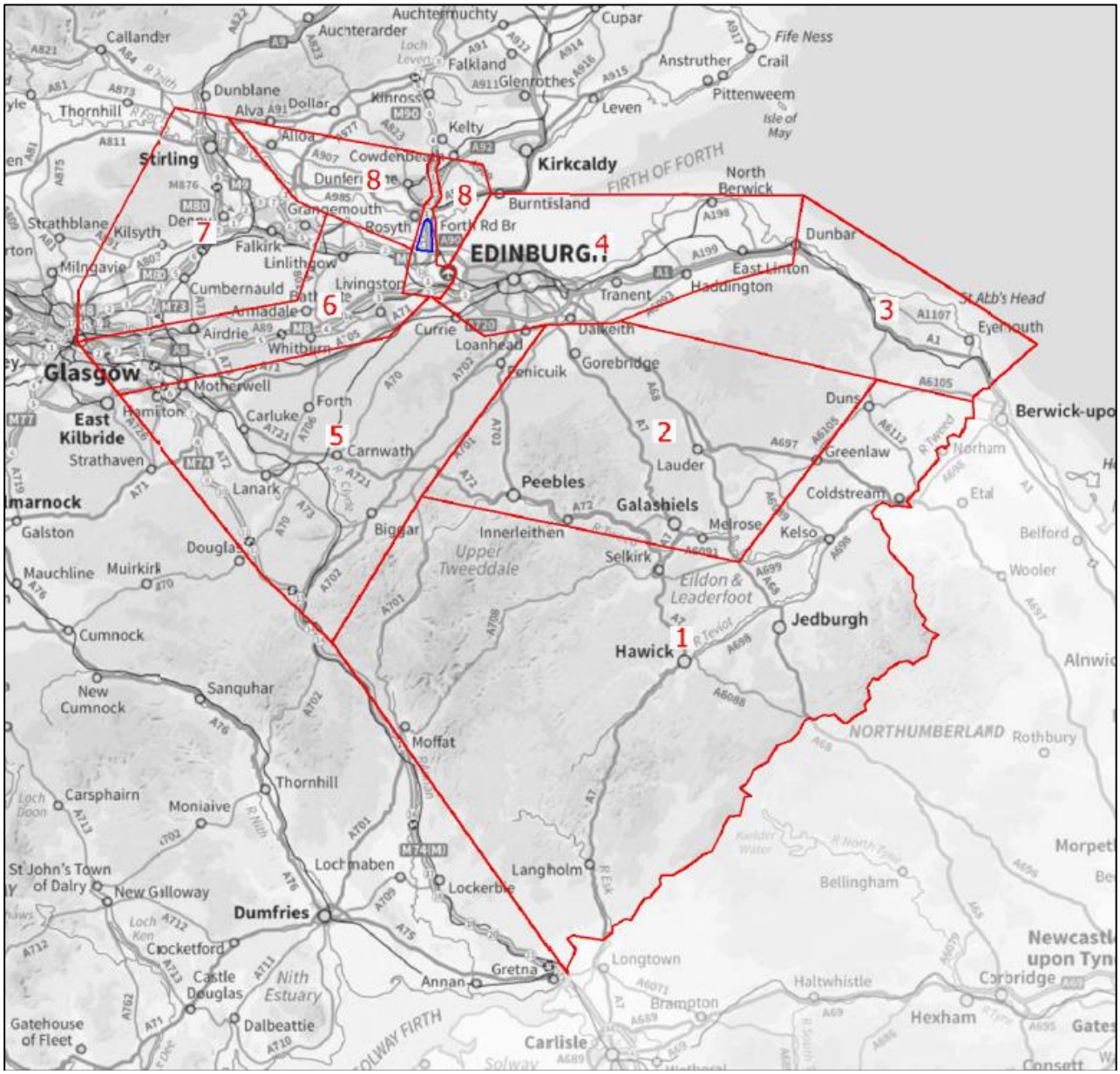
Appendix WSP9 – Location of Winter Service Infrastructure – Vertical Concrete Barriers

There are permanent concrete barriers between A720 Baberton Junction (Water of Leith Bridge) and Lothianburn Junctions and between M90 Scotstoun Bend through to the J1c Admiralty Offslip.

Route	Location	Description
A720	Baberton Junction (Water of Leith Bridge) to Lothianburn	Concrete central reserve barrier
M90	Scotstoun Bend to J1c Admiralty Offslip	Concrete central reserve barrier

Care will be taken to ensure that deep lying snow is ploughed away from these vertical barriers by the use of echelon ploughing to the left verge.

Appendix WSP10 – Forecast Domains



Domain Number	Route	Location
1	A7	Terrona
2	A68	Soutra
3	A1	Grantshouse
4	A720	Swanston
5	A702	Abington
6	M8	Whitburn
7	M80	Haggs
8	M90	Halbeath
9	M90/A9000	Forth Road Bridge NW

Appendix WSP11 – Snow and Ice Build-Up on Bridges

Definition of snow and ice accretion - snow and ice accretion is the gradual build-up of atmospheric water in a solid form on the surfaces of structures on which it impinges. It includes precipitation icing (freezing rain).

When snow or ice accretion occurs on the structure of the bridge assessments need to be made to balance road user safety against the significant disruption that would be caused by closing the bridge.

During the winter period precipitation,, relative humidity, wind speed and temperature are closely monitored by the on-duty Bridges Engineer using the Mercury system. . . If the following parameters are met then ice accretion may occur.

- Relative Humidity exceeds 90%.
- Wind Speed exceeds 8m/s
- Temperature is between MS1.5ºC and +1.5ºC
- (Note: these are guidelines only and snow accretion could occur when conditions are outside these parameters).

Should the Mercury system indicate a high or severe risk of ice accretion physical patrols will be implemented. The main cables, cable bands, main tower faces and tower top lifting beams should be monitored for snow / ice accretion. This is done by inspection teams using binoculars from the footways or if conditions allow, from the tower tops and cables – and reported to the WSDO. The WSDO will take advice, where required, from the Severe Weather Manager. Records will be produced and retained in respect of any such accumulations.

If significant snow or ice accretions are identified the bridge will be closed to all road users to allow the extent of the accretions to be assessed. Should ice accretion occur on the Forth Road Bridge and if it is deemed safe to so the FRB shuttle bus will be mobilised for pedestrians and cyclists at this time. When traffic lanes are closed the shuttle bus service will cease.

In certain prevailing wind conditions accretions on the external face of a tower leg on the Forth Road Bridge maybe unlikely to affect the carriageway. WSDO/SWM would consult with Police Scotland and Transport Scotland to discuss any potential partial openings of the bridge.

Once ice accretion has occurred then the bridge will remain closed until it is considered safe to reopen a lane, a carriageway or the bridge. Further discussions will be held with Police Scotland and Transport Scotland throughout.

Throughout this process it is important that continual monitoring and inspection is undertaken is to ensure public and employee safety.

Throughout the winter period the requirement to have traffic management resources immediately available will discussed with relevant partners.

The table below is taken from the contract documents, we have recently reviewed the list of Known Vulnerable Locations in the SE Unit and proposed some changes to TS. Our review was submitted on 08/07/22 and we are awaiting comment

Table of Known Vulnerable Locations

Road Number	Location	Vulnerability type
A1	Dunbar to E	Water run-off
A6091	Newstead	Water run-off
A68	North of Fala	Water run-off
A7	North of Teviothead at Priesthaugh Junction to Skippers Bridge near Langholm includes area at sewage works	Water run-off
A7	North of Skippers Bridge near Langholm	Water run-off
A7	South of Langholm at entrance to Sewage Treatment Works	Water run-off
A702	Immediately North of Silverburn	Water run-off
A702	North of Abington	Water run-off
A9000	Forth Road Bridge	Frost susceptible
M8	J3 to J5	Frost susceptible
A68	Huntsford Bends to Carter Bar	Frost susceptible
A68	Pathhead to Soutra	Frost susceptible
A68	South of Soutra to Carfraemill	Frost susceptible
A7	Newmills to Castle Hermitage junction	Frost susceptible
A702	South of A703 junction to north of West Linton	Frost susceptible
A702	Candymill to north of Coulter	Frost susceptible
A7	Auchenrivock Improvement	Significant gradient
A68	Soutra	Significant gradient
A68	Carter Bar	Significant gradient
A68	St Boswells to Ancrum	Significant gradient
A720	Calder to Baberton	Significant gradient
M8	Livingston	Significant gradient

Reserve fleet/additional winter plant will be mobilised where the forecast indicates snow accumulations of 0.2cm/hr or greater as per Schedule 2 Section 6.2.31 on a vulnerable location with a significant gradient. All other plant will be deployed as required based on Appendix WSP20 Snow Forecast Resource Deployment Matrix or as instructed by Transport Scotland in relation to Snow Plans.

VULNERABLE LOCATION – A9000 FORTH ROAD BRIDGE

Location	A9000 Forth Road Bridge
Grid Reference	312462, 678185 to 312605, 681143
Problems	2.5km of the carriageway over the Forth Road Bridge where traffic flows have substantially reduced due to the change in use of the bridge as becoming part of the Public Transport Corridor. • Frost is prone to occur • A significant build-up of snow has the potential to happen • Extreme low temperature could occur
Has this site experienced problems before or is it an identified risk?	The site has experienced extreme low temperatures and high snow build-up that has created, not only a risk to the few vehicles that use the bridge, but also the bridge itself, due to the weight of the snow building on the structure.
Detailed Mitigation Measures – Significant Snowfall	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed • If possible, move resources from areas not affected by snow • To close the Forth Road Bridge to all traffic when either the road surface temperature gets below the threshold level, or that the snow build-up has exceeded the threshold level. This would stay in place until the weather event has passed or that temperatures were high enough that frost and ice would not be present. • Remove snow by mechanical means if the snow build-up poses a risk to the structure
When enacted	• When the South East Weather Station has identified that the surface temperature has gone down below MS10°C (threshold level), or that there is lying snow present on the carriageway. • Reserve fleet/additional winter plant will be mobilised where the forecast indicates any significant snow accumulations
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS to warn drivers of driving conditions or closure.

VULNERABLE LOCATION – A68 HUNTSFORD BENDS TO CARTER BAR	
Location	A68 Huntsford Bends to Carter Bar
Grid Reference	368982, 608874 – 369822, 606805
Problem	Significant snow accumulations and drifting over higher ground 200 – 350m, gradient can cause HGVs to lose traction.
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open. The A68 in Northumberland is not a trunk road and has a lower level of winter service which can affect the running of the A68 in Scotland.
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• The patrol runs 3 miles into England to check conditions to allow the WSDO to contact Northumberland Council • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7°C
When enacted	• All patrols will run into England • Reserve fleet/additional winter plant will be mobilised where the forecast indicates any snow accumulations greater than 0.2mm intensity per hour as per Schedule 2 Section 6.2.31.Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from Scottish Borders Council and local farmers

VULNERABLE LOCATION – A68 PATHHEAD TO OXTON	
Location	A68 Pathhead to A68 Oxton prior to Carfraemill
Grid Reference	339981,663726 – 349317,654609
Problem	Significant snow accumulations and drifting over higher ground 200 – 350m.
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open. This is the highest point on the South East Network
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed at Soutra Hill to provide extra assistance if required • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7^{o}C • If required snow gates will be closed • Extend to Pathhead Village
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates any snow accumulations greater than 0.2mm intensity per hour as per Schedule 2 Section 6.2.31.Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager • Police Scotland will make any decision on closing the road
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from Scottish Borders Council and local farmers

VULNERABLE LOCATION – M8 J3 LIVINGSTON TO J5 SHOTTS	
Location	M8 J3 Livingston to M8 J5 Shotts
Grid Reference	304774,670298 – 286711,663890
Problem	13-mile length of 2 Lane Motorway at higher altitude (200 -250m) prone to significant snow accumulations
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open.
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed on the M8 to provide extra assistance if required • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7°C • Request assistance from Amey on the M8 DBFO contract if they are not affected. This will allow resources to move slightly further east and enable more vehicles to be on the road and treating • Closure of slip roads using emergency traffic management
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates any snow accumulations greater than 0.2mm intensity per hour as per Schedule 2 Section 6.2.31. • Alternative de-icers will be used with prior consent from Transport Scotland • Emergency traffic management will be placed on site prior to any extreme weather being forecast • Comply with Operating Company requirements as identified in the Snow Plans of DBFO Contract Providers when enacted by Transport Scotland or the relevant parts of Unit
Who enacts	• WSDO in consultation with Severe Weather Manager • Severe Weather Manager will consult Transport Scotland prior to using the traffic management • Police Scotland will make any decision on closing the road and implement the traffic management
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from local councils and local farmers if possible

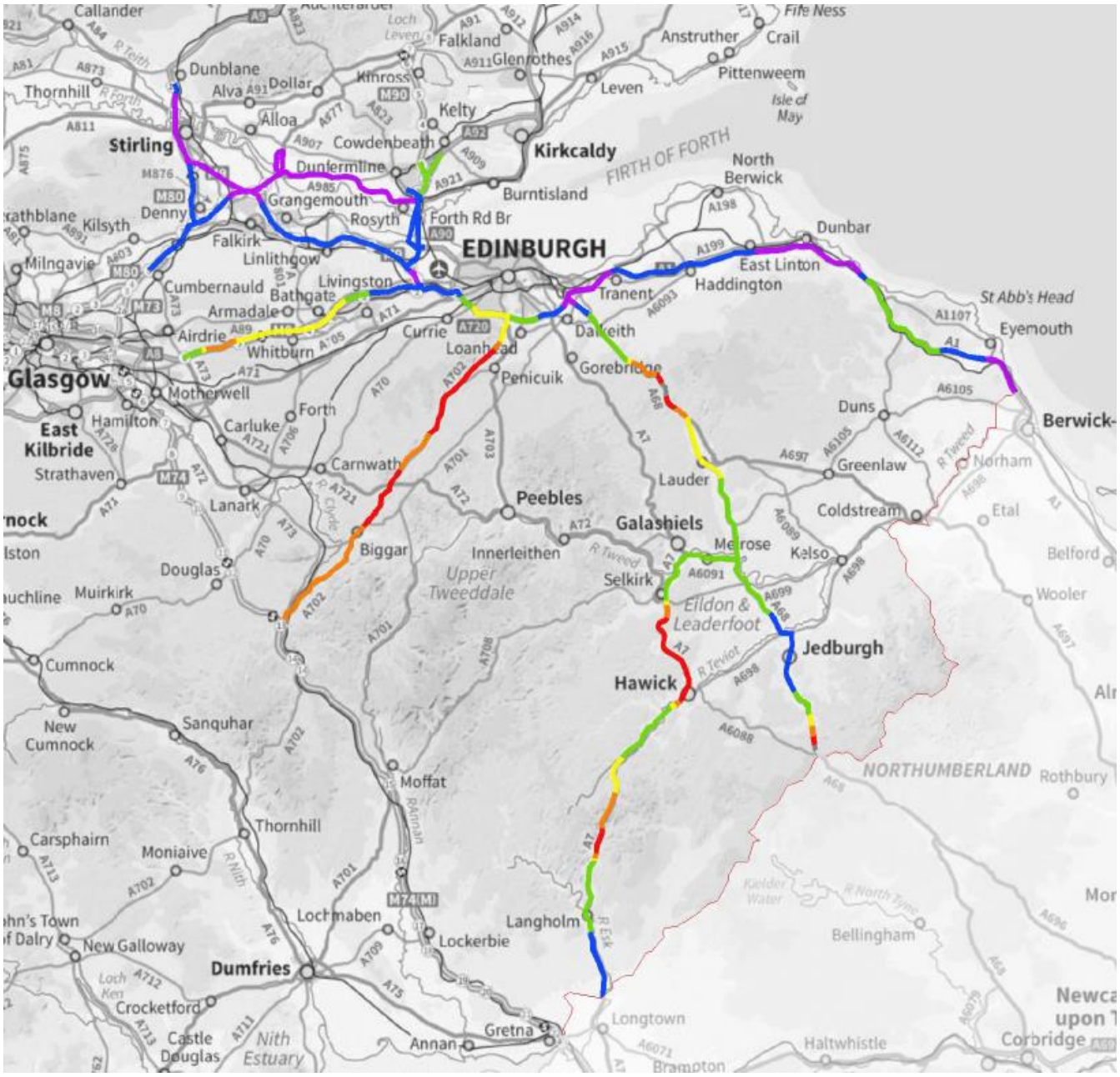
VULNERABLE LOCATION – A7 NEWMILL TO CASTLE HERMITAGE JUNCTION	
Location	A7 Newmill to Castle Hermitage Junction
Grid Reference	345300, 610511 – 338831, 596216
Problem	Significant snow accumulations and drifting over higher ground 200 – 350m
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open.
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7^{o}C • Request assistance from Scottish Borders Council
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates any significant snow accumulations • Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from local councils and local farmers if possible

VULNERABLE LOCATION – A702 SOUTH OF A703 TO NORTH OF WEST LINTON	
Location	A702 South of A703 Junction to North of West Linton
Grid Reference	325012,666305 – 315323,652319
Problem	Significant snow accumulations and drifting over higher ground 200 – 250m
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open. The steep verges make this area difficult to remove snow and long straights are prone to drifting.
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7^{o}C • Request assistance from local councils and farmers
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates any significant snow accumulations • Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from local councils and local farmers if possible

VULNERABLE LOCATION – A702 CANDYMILL TO NORTH OF COULTER	
Location	A702 Candymill to North of Coulter
Grid Reference	307403,641754 – 302375,634100
Problem	Significant snow accumulations and drifting over higher ground 200 – 250m
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to ensure it remains open. The steep verges make this area difficult to remove snow and long straights are prone to drifting
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7^{o}C • Request assistance from local councils and farmers
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates significant snow accumulations • Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from local councils and local farmers if possible

VULNERABLE LOCATION – A68 ST BOSWELLS TO ANCRUM	
Location	A68 St Boswells to Ancrum
Grid Reference	363479, 630500 – 363479, 624944
Problem	The area has a number of small dips and hills along the whole section along with a few junctions. When vehicles stop to turn into junctions HGVs can then struggle for traction.
Has this site experienced problems before or is it an identified risk?	Over a number of years this area has required additional resources to assist HGVs with traction once stopped. Once moving again there are no issues.
Detailed Mitigation Measures	
Optional Mitigation Primary Measure	• During snow events reserve fleet/additional winter plant may be deployed • If possible, move resources from areas not affected by snow • Consider the use of alternative de-icers when temperatures are below MS7^{o}C
When enacted	• Reserve fleet/additional winter plant will be mobilised where the forecast indicates snow accumulations of greater than 1.0cm over several hours as per Schedule 2 Section 6.2.31. • Alternative de-icers will be used with prior consent from Transport Scotland
Who enacts	• WSDO in consultation with Severe Weather Manager
Other Measures	• Use of VMS sign to warn drivers of driving conditions or closure • Extra assistance from Scottish Borders Council and local farmers if possible

Appendix WSP13 – Route Altitude Map



Appendix WSP14 – Daily Winter Action Plan (Planned and Actual)

PLANNED

The Daily Winter Action Plan is generated and emailled directly from Vaisala Manager in a template format, as below.

BEAR South East - DAP [*Date*] – [*x*] Frontline – [*x*] Patrol - RST [*Min RST*]

Action Summary

[*Summary of Actions for the next 24-hour period*]

Created by [*Winter Service Duty Officer*], Approved by [*Severe Weather Manager/ Duty Severe Weather Managers*]

Weather Forecast [*Headline*]

[*Confidence Level*]

[*General Synopsis*]

Snow Summary

[*Snow Forecast*]

All - Action Plans

EXAMPLES FROM NMC SE Unit

All - Action Plans

Route	Action	Cause	Start Time	Forecast Min Road Temp
A1 - A1 Cockburnspath to National Boundary	No Action	No Hazard	09.03.2022 02:00	2.9
A2 - A1 Tranent to Cockburnspath Roundabout	No Action	No Hazard	09.03.2022 02:00	2.9
A3 - A1/A720 M8 - Tranent to M9 Newbridge	No Action	No Hazard	09.03.2022 02:00	3.5
A4 - M9/M8 M9 Newbirgde to M8 Shotts	No Action	No Hazard	09.03.2022 02:00	4.0
A5 - M9 Newbridge to Jct 9 Pirnhall	No Action	No Hazard	09.03.2022 02:00	3.1
A6 - M80, M8, M876 Bowtrees, Haggs to Keir Roundabout	No Action	No Hazard	09.03.2022 02:00	3.1
A7 - M90, A90 Ferrytoll, Kirkliston to A90 Dalmeny	No Action	No Hazard	09.03.2022 02:00	5.2
A8 - Ferrytoll, Forth Road Bridge to A90 Dalmeny	No Action	No Hazard	09.03.2022 02:00	5.2
B1 - A985 Rosyth, A876 Clackmannanshire Bridge A977 Kincardine	No Action	No Hazard	09.03.2022 00:00	3.9
B2 - A702 Lothianburn to Abington	No Action	No Hazard	09.03.2022 00:00	3.3
B3 - A68 Millerhill to Ravenswood	No Action	No Hazard	09.03.2022 00:00	3.6
B4 - A7 Ashkirk, A6091 A68 Carter Bar	No Action	No Hazard	09.03.2022 00:00	2.6
B5 - A7 Ashkirk to National Boundary	No Action	No Hazard	09.03.2022 00:00	2.9
SE20R01 A7 Selkirk to Nat Bou	No Action	No Hazard	08.03.2022 15:00	2.9
SE20R02 - A7 Selkirk - A6091 - A68 Nat Bou	No Action	No Hazard	08.03.2022 15:00	2.6
SE20R03 - A1 Thistly Cross to Nat Bou	No Action	No Hazard	08.03.2022 15:00	2.9
SE20R04 - A68 Millerhill to Ravenswood Roundabout	No Action	No Hazard	08.03.2022 15:00	3.6
SE20R05 - A702 Lothianburn to Abington	No Action	No Hazard	08.03.2022 15:00	3.3
SE20R06 - A720 Gogar to A1 Thistly Cross	No Action	No Hazard	08.03.2022 15:00	3.5
SE20R07 - A1 Thistly Cross to Gogar	No Action	No Hazard	08.03.2022 15:00	3.5
SE20R08 - M8 Newhouse to M9 Kirkliston	No Action	No Hazard	08.03.2022 15:00	4.0
SE20R09 - M9 Kirkliston to M8 Newhouse	No Action	No Hazard	08.03.2022 15:00	4.0
SE20R10 - M9 Jct 1 Kirkliston to Jct 11	No Action	No Hazard	08.03.2022 15:00	3.1
SE20R11 - M9 Jct 11 to Jct 1 Kirkliston	No Action	No Hazard	08.03.2022 15:00	3.1
SE20R12 - M80 to M876	No Action	No Hazard	08.03.2022 15:00	3.1
SE20R13 - M90 Nth and Sth Approach to Queensferry Crossing	No Action	No Hazard	08.03.2022 15:00	5.2
SE20R14 - A895 Admiralty to Gartarry Roundabout	No Action	No Hazard	08.03.2022 15:00	3.9
SE20R15 - Forth Structures	No Action	No Hazard	08.03.2022 15:00	4.0
SEFW1 – Borders South Footpaths	No Action	No Hazard	08.03.2022 15:00	
SEFW2 – Borders North Footpaths	No Action	No Hazard	08.03.2022 15:00	
SEFW3 – A985 Footpaths	No Action	No Hazard	08.03.2022 15:00	
SEFW4 – Forth Road Bridge Footpath	No Action	No Hazard	08.03.2022 15:00	

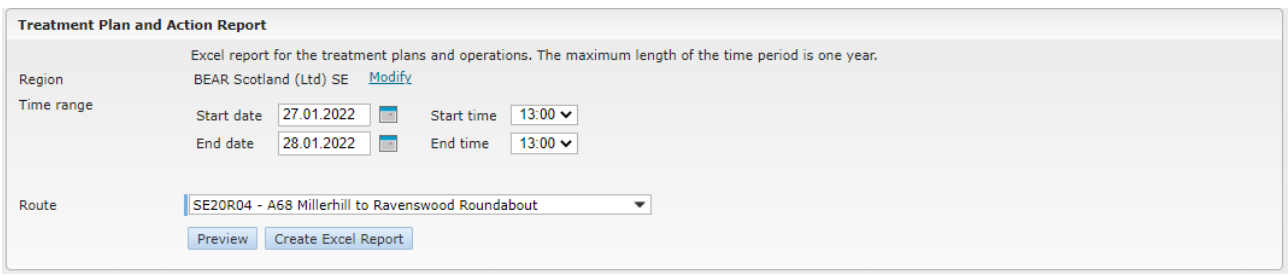
This message was sent by [WSDO]/BEAR Scotland Ltd (SE) via Vaisala RoadDSS Manager system.

ACTUAL

The Actual Actions are recorded and stored electronically in Vaisala Manager. These can be called up by generating a Treatment Plan and Action Report for the required time period.

A screenshot showing the output from Vaisala Manager is below. The Reports can also be exported in Excel format.

EXAMPLES FROM NMC SE Unit



Report preview - Report created at 05.07.2022 12:08

Summary for SE20R04 - A68 Millerhill to Ravenswood Roundabout

27.01.2022 13:00 → 28.01.2022 13:00

Route	Total chemical or plow actions	Number of days with operations	Number of days without any operation	Total salt amount used (Tonne)	NaCl Pre-wet 10g/m2	NaCl Pre-wet 20g/m2
SE20R04 - A68 Millerhill to Ravenswood Roundabout	2	2	0	9.73	1	1

Plans and operations for SE20R04 - A68 Millerhill to Ravenswood Roundabout

27.01.2022 13:00 → 28.01.2022 13:00

Route	Type	State	Action	Cause	Planned Start	Started	Completed	Duration (minutes)	Vehicle	Driver	Salt Depot	Salt Amount Used (Tonne)	Comments
SE20R04 - A68 Millerhill to Ravenswood Roundabout	Action plan	Closed	NaCl Pre-wet 20g/m2	Hoar Frost	27.01.2022 15:00								
SE20R04 - A68 Millerhill to Ravenswood Roundabout	Operation	Closed	NaCl Pre-wet 20g/m2	Hoar Frost	27.01.2022 15:00	27.01.2022 14:00 !	27.01.2022 15:05	65	SN70 XVS		Charlesfield Depot	6.57	Ross - 07984810338
SE20R04 - A68 Millerhill to Ravenswood Roundabout	Action plan	Closed	NaCl Pre-wet 10g/m2	Hoar Frost	28.01.2022 03:00								
SE20R04 - A68 Millerhill to Ravenswood	Operation	Closed	NaCl Pre-wet 10g/m2	Hoar Frost	28.01.2022 03:00	28.01.2022 03:00	28.01.2022 03:50	50	SN70 XVS	Glen Morris - 07548099478	Charlesfield Depot	3.16	

Appendix WSP15 – Winter Service Plant

(Table 6.1.6) – Winter Service Plant for All Winter Patrols

Type and Registration No*	Depot Location	Specification including Capacity	Quantity	Plant Use *
Daf/ Schmidt	Charlesfield	6m³ pre-wet spreader	2	(ii)
Daf/ Schmidt	Bonnyrigg	6m³ pre-wet spreader	4	(ii)
Daf/ Schmidt	Eyemouth	6m³ pre-wet spreader	1	(ii)
Daf/ Schmidt Daf/Econ	Burghmuir	6m³ pre-wet spreader 9m³ pre-wet spreader / 3000 litre sprayer combination	1 1	(ii) (ii)
Daf/ Schmidt	Chryston	6m³ pre-wet spreader	1	(ii)
Daf/ Econ	Rosyth	9m³ pre-wet spreader / 3000 litre sprayer combination	3	(ii)

(Table 6.1.7) – Frontline Winter Service Plant Permanently Available and Located in the Unit for Winter Service for Carriageways

Type of Winter Service Plant and Registration Number**	Depot Location	Vehicle Capacity	Number of Vehicles	Plant Use*
32t Daf/ Econ	Charlesfield	12m³	4	(i)
32t Daf/ Econ	Eyemouth	12m³	2	(i)
32t Daf/ Econ	Bonnyrigg	12m³	4	(i)
32t Daf/ Econ	Burghmuir	12m³	5	(i)
32t Daf/ Econ	Chryston	12m³	2	(i)
32t Daf/ Econ	Lochgelly	12m³	2	(i)
32t Daf/ Econ 26t Daf/ Econ spray tanker	Rosyth	12m³ 10,000 litres	2 1	(i) (i)

As per NMC requirement all frontline winter service pant in table 6.1.7 above is named as approved by Transport Scotland in December 2020

(Table 6.1.8) – Frontline Winter Service Plant Permanently Available and Located in the Unit for Winter Service for Footways, Footbridges and Cycling Facilities

Type of Winter Service Plant and Registration Number**	Depot Location	Vehicle Capacity	Number of Vehicles	Plant Use*
Footway tractor, demountable spray tank, salt hopper and plough	Charlesfield	250L or 0.5t	2	(i)
Footway tractor, demountable spray tank, salt hopper and plough	Bonnyrigg	250L or 0.5t	1	(i)
Footway tractor, demountable spray tank, salt hopper and plough	Rosyth	250L or 0.5t	1	(i)
Pedestrian fully electric brine sprayer	Rosyth, Burghmuir Bonnyrigg (2) Charlesfield	50L	5	(i)
Multihog multi-purpose vehicle with split tank for Brine & PA, demountable nylon brush for front	S. Queensferry	1000L	1	(i)

(Table 6.1.9) – Reserve Winter Service Plant Permanently Available and Located in the Unit for Winter Service for Carriageways, Footways, Footbridges and Cycling Facilities

Type of Winter Service Plant & Registration Number**	Depot Location	Vehicle Capacity	Number of Vehicles	Plant Use*
Demount pre-wet spreader	Charlesfield	12m³	1	(i)
Demount pre-wet spreader	Bonnyrigg	12m³ 6m³	1 2	(i) (i) and (ii)
Demount pre-wet spreader	Burghmuir	12m³ 6m³	2 1	(i) (i) and (ii)
Demount pre-wet spreader	Eyemouth	6m³	1	(i) and (ii)
Demount pre-wet spreader	Chryston	12m3 6m³	1 1	(i) (i) and (ii)
Demount pre-wet spreader Demount tanker sprayer	Rosyth	12m3 10,000 L	1 1	(i) (i)
Footway tractor, demountable salt hopper and plough	Bonnyrigg	0.5t	1	(i)
Footway tractor, demountable salt hopper and plough	Burghmuir	0.5t	1	(i)

** (i) precautionary treatment and clearance of snow with a depth up to 100 millimetres.*
(ii) Winter Service Patrols
***Appendix WSP25 details vehicle registration numbers*

(Table 6.1.10) – Additional Winter Service Plant

Type of Winter Service Plant & Registration Number	Depot Location/Third Party Operator	Vehicle Capacity	Number of Vehicles	Mobilisation Time
Tractor Plough	Charlesfield		1	2 hours
Tractor Plough	Bonnyrigg		1	2 hours
Tractor Plough	Burghmuir		1	2 hours
Snowblower	Charlesfield		1	2 hours
Snowblower	Burghmuir		3	2 hours
Footway Snowblower	Queensferry		1	2 hours
V plough (to fit existing tractors)	Burghmuir		1	2 hours
Tractor Plough / Snowblower	Agri Services A92 Ladybank		1	4 hours
Tractor Plough	Borders Machinery Ring (various locations)		6	4 hours
Tractor Plough	Broadwoodhead Haddington		1	4 hours
Tractor Plough	Grant Ritchie Gorebridge		2	4 hours
Tractor Plough	Howieson A702 West Linton		2	4 hours
Tractor Plough	Jason Steel Falkirk		1	4 hours
Raiko Icebreaker	Transport Scotland (Burghmuir)		1	4 hours

Appendix WSP16 – Examples of Forms Completed by Winter Maintenance Operational Staff

Winter Driver's Record

Winter Drivers Record		
Document:	Form: #406	ACTION PLAN DATE:
Issue:	#9	/ /
Related to:	All Contracts	

Depot			Vehicle Reg:			Time called out for Unplanned Action	
AutoRoute	Yes	No	Route Card	20	40	Route No	
Brine Used	Yes	No	If No Brine Why?				
Alternative De-icer Used	Yes	No	Routes which require Potassium Acetate:	South East Unit: SE20-15, SE40-22. North West Unit: NW20-07, NW20-10, NW20-14, NW40-10, NW40-12, NW40-17			
Amount Used (lts)			If Route requires Potassium Acetate has it been used?	YES / NO	Amount used (ltr)	If not why?	
Frontline Patrol (FLP)	Yes	No					

Weight when loaded		
Time Left Depot		
Start of Action	Date	
	Time	
End of Action	Date	
	Time	
Time returned to Depot		
Weight on Return		

Note: In table below enter treatment code in appropriate column.
State approx. treated length (km) and locations for part-route treatments.

Action Taken	Planned	Unplanned
T1: Treatment 10 g/m²		
T1.5: Treatment 15 g/m²		
T2: Treatment 20 g/m²		
T3: Treatment 30 g/m²		
T4: Treatment 40 g/m²		
TE: Treatment Potassium Acetate		
TF - Plough / salt whole route		
TP - Plough / salt part route detail below		
T*P: Treatment part route *= 1,2,3,4 or E		
Area's Req. Special Attention treated at 40 g/m²	Yes	No

Part route treatment	1. from		to	
	2. from		to	
	3. from		to	
	4. from		to	

Rate of Spread (g/m²)		Spread Width (m)	

Did Planned Action commence on time? Yes / No / Not applicable
Did Unplanned Action commence within 1 hour of call out? Yes / No / Not applicable
Was pre-treatment completed within 2 hours? Yes / No / Not applicable

If "No" to any of the above, give reasons/comment:

I confirm that the above is a true and accurate record of the Winter Maintenance action carried out. I claim that the above hours worked on unplanned treatment are exempt from UK domestic driver's hours restrictions.

Signed (Driver): **Name:** **Date:**

FOR SUPERVISORS USE ONLY

Supervisors Comments:

Document reason(s) for non-conformity, if applicable:

I have checked the above report and consider that the work has been undertaken in accordance with the specification and is a true and accurate record of the Winter Maintenance action carried out

Signed (Supervisor): **Name:** **Date:**

NOTE: Completed form to be scanned and electronically returned to Control Room

Patrol Route Records

Drivers Patrol Route A1 (Ex Bonnyrigg)	
Document:	Form #567
Issue:	#2
Related to:	NMC - SE

1. **A1 Cocksburnpath R/A – Start of patrol**
2. **A1 Grantshouse**
3. **A1 Reston**
4. **A1 Lemington**
5. **A1 Grantshouse**

ACTION PLAN DATE:	UNIQUE ID:
_____/_____/_____	

Print Drivers Name- ..... **Sign Drivers Name-** .....

Start Weight ..... **End Weight** .....

Date: ..... **Vehicle Reg** .....

Patrol 1- start 02:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Cocksburnpath						
Grantshouse						
Reston						
Lemington						
Grantshouse						

Patrol 2- start 04:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Cocksburnpath						
Grantshouse						
Reston						
Lemington						
Grantshouse						

Patrol 3- start 06:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Cocksburnpath						
Grantshouse						
Reston						
Lemington						
Grantshouse						

Patrol 4- start 08:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Cocksburnpath						
Grantshouse						
Reston						
Lemington						
Grantshouse						

Patrol Runs from A1 Cocksburnpath Roundabout to National Boundary and the tables above show where the temperatures should be recorded. When not Patrolling wait at ***Grantshouse*** unless otherwise instructed. Information must be returned to Control Room for every patrol.

Supervisor sign ..... Date.....

I have checked the above report and consider that the work has been undertaken in accordance with the specification and is a true and accurate record of the Winter Maintenance action carried out.

Drivers Patrol Route B1 (Ex Rosyth)	
Document:	Form #575
Issue:	#2
Related to:	NMC - SE

1. **A985 Kings Road**
2. **A985 Crombie**
3. **A985 High Valleyfield**
4. **A977 Gartarry Rdbt**
5. **A985 Cairneyhill**

ACTION PLAN DATE:	UNIQUE ID:
_____/_____/_____	

Print Drivers Name- ..... **Sign Drivers Name-** .....

Start Weight ..... **End Weight** .....

Date: ..... **Vehicle Reg** .....

Patrol 1- start 00:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Kings Rd						
Crombie						
High Valleyfield						
Gartarry Rdbt						
Cairneyhill						

Patrol 2- start 03:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Kings Rd						
Crombie						
High Valleyfield						
Gartarry Rdbt						
Cairneyhill						

Patrol 3- start 06:00 Start Time..... End Time.....

Location	Time	RST	Air Temp	Grip	Road/ Weather Conditions	Comments
Kings Rd						
Crombie						
High Valleyfield						
Gartarry Rdbt						
Cairneyhill						

Patrol Runs from M90 Admiralty via A985 to Kincardine Bridge and Clackmannshire Bridge to A977 Gartarrry Roundabout and Kincardine and the tables above show where the temperatures should be recorded. When not Patrolling wait at ***Cairneyhill*** unless otherwise instructed.
Information must be returned to Control Room for every patrol.

Supervisor sign ..... Date.....

I have checked the above report and consider that the work has been undertaken in accordance with the specification and is a true and accurate record of the Winter Maintenance action carried out.

Appendix WSP17 (Table 6.1.11) – Operating Company's Compounds, Depots and Facilities

Compound/Depot/Facility Name	Owner	Postal Address	Purpose	Access Arrangements	Contact Details	Facilities
Queensferry	Transport Scotland	EH30 9SF	Head Office	M90 via A904	Via Network Hub	Head office, welfare, Forth Road Bridge Compound
Burghmuir	Transport Scotland	EH49 7LR	Office, Operational and Winter Depot	M9 J3 near Linlithgow	Via Network Hub	Office, mess, welfare, material/salt store, weighbridge
Chryston	Aggregate Industries	G69 0JL	Office, Operational and Winter Depot	M80 Moodiesburn	Via Network Hub	Office, mess, welfare, material/salt store, weighbridge
Bonnyrigg	Derek Hogg/David McGuinness	EH20 9LZ	Main Office, Operational and Winter Depot	A7	Via Network Hub	Office, mess, welfare, material/salt store, weighbridge
Charlesfield	Breedon	TD60 0HH	Office, Operational and Winter Depot	A68 Newtown St Boswells	Via Network Hub	Office, mess, welfare, material/salt store, weighbridge
Rosyth	Scarborough Muir	KY11 2XB	Operational and Winter Depot	Forties Campus/Barham Road	Via Network Hub	Mess, welfare, material/salt store, weighbridge
Eyemouth	Scottish Borders Council	TD14 5SF	Operational and Winter Depot	Gunsgreenhill Technology Park Eyemouth	Via Network Hub	Mess, welfare, material/salt store, weighbridge
Lochgelly	Purvis Group	KY5 8LL	Operational and Winter Depot	Cartmore Ind. Est. Lochgelly	Via Network Hub	Mess, welfare, material/salt store, weighbridge

Appendix WSP18 (Table 6.11, 6.11.1/2/3/4 and 6.12.1/2) – Decision Matrix for Winter Service

Table 6.11 – Decision Matrix for Winter Service

Table 6.11.1 – Decision Matrix for Winter Service

<table>
<tr><td rowspan="2">Road Surface Temperature</td><td colspan="3">Predicted Road Conditions</td></tr>
<tr><td>Wet</td><td>Wet Patches</td><td>Dry</td></tr>
<tr><td>May fall below 1°C</td><td rowspan="2">Salt before frost</td><td>Salt before frost (See note A)</td><td>No action likely, monitor weather (See note A)</td></tr>
<tr><td rowspan="4">Expected to fall below 1°C</td><td colspan="2">Salt before frost (see note B)</td></tr>
<tr><td colspan="3">Salt after rain stops</td></tr>
<tr><td colspan="3">Salt before frost and after rain stops (see note C)</td></tr>
<tr><td colspan="2">Salt before frost</td><td>Monitor weather conditions</td></tr>
<tr><td>Expected snow</td><td colspan="3">Salt before snow</td></tr>
<tr><td rowspan="3">Freezing Rain</td><td colspan="3">Salt before rainfall (see note C)</td></tr>
<tr><td colspan="3">Salt during rainfall (see note C)</td></tr>
<tr><td colspan="3">Salt after rainfall (see note C)</td></tr>
</table>

Notes:

(a) Particular attention should be given to any possibility of water running across carriageways and such locations should be monitored and treated as required.
(b) When a weather forecast contains reference to expected hoarfrost considerable deposits of frost are likely to occur and close monitoring will be required. Particular attention should be given to the timing of precautionary treatments due to the possibility that salt deposited on a dry road may be dispersed before it can become effective.
(c) Under these circumstances rain will freeze on contact with running surfaces and full pre-treatment should be provided even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.

Table 6.11.2 sets out the spread rates for precautionary treatments. Rate of spread for precautionary treatments should not be adjusted to take account of residual salt or surface moisture unless stated otherwise.
The rates in the table below are for precautionary salt treatment prior to snowfall that is essential to form a de-bonding layer and snow clearance.

Table 6.11.2 – Treatment Matrix Spread Rates for Precautionary Treatments

Item	Forecast weather condition	Dry or damp road (grammes/square metre)	Road Surface Wet / Frost Susceptible / Surface Water Run-off Area (grammes/square metre)
1	RST higher than plus 1°C	0	0
2	RST lower than or equal to plus 1°C but higher than minus 2°C	10	20
3	RST lower than or equal to minus 2°C but higher than minus 5°C	15	30
4	RST lower than or equal to minus 5°C (or see TS alternative de-icer guidance)	30	40
5	Freezing Fog	Add 5 to Item 1 to 4 as applicable	Add 10 to Item 1 to 3 as applicable; otherwise as per item 4.
6	Freezing Rain	40	40
7	Snow Accumulations of any depth	40	40

Table 6.11.3 – Precautionary Treatment Potassium Acetate Spreading Rates

Conditions forecast	Spread Rate (litres/square metre)
Road surface temperature lower than or equal to plus 1°C but higher than minus 2°C	0.0156
Road surface temperature lower than or equal to minus 2°C but higher than minus 5°C	0.0312
Frost and road surface temperature lower than	a minimum of 0.0312 which should be increased with manufacturer's recommendations
-5°C	
Snow	
Freezing conditions after rain	

Table 6.11.4 – Snow or Ice Clearance Salt Spreading Rates

Road Surface Condition	Treatment				
	Spreading Salt (grammes/square metre)	Ploughing	Blowing	Alternative De-Icer	Ice Breaker
Ice Formed	40	No	No	Where Applicable	No
Snow covering of less than 30mm	40	Yes	No	No	No
Snow covering exceeds 30mm	40	Yes	No	No	No
Snow accumulations due to prolonged snowfall	40	Yes (continuous)	Where applicable	No	No
Hard packed snow/ice less than 20mm thick	40 (successive treatments)	No	No	No	Where applicable
Hard packed snow/ice	salt/abrasive (successive)	No	No	Yes	Yes

Attachment 6.12 Snow Clearance

Table 6.12.1 Snow Clearance

Condition Criteria	Category A Patrol Routes		Non Category A Patrol Routes	
	Dual Carriageways & Motorways		Dual Carriageways	Dual Wide Single 2+1 & Single Carriageways
	Number of Existing Lanes		Number of Existing Lanes	
	2	3 or More	2	1 or 2 (WS 2 + 1)
	Minimum number of lanes in each direction free from ice and snow as far as is reasonably practicable		Minimum number of lanes in each direction free from ice and snow as far as is reasonably practicable (Except where snow gates)	
Snow at any time	1	2	1	1
Following clearance of minimum lanes or the cessation of snow fall all lanes are to be clear of snow	3 hours	3 hours	3 hours	3 hours

Table 6.12.2 Road Surface Wetness

Definition	Description	Water film thickness (for when using WFT instrumentation)
Dry Road	A road that shows no signs of water or dampness at the surface but may be just detectably darker. It may have moisture contained in pores below the surface that is not 'pumped' to the surface by traffic.	0 to 0.03mm (=0-30 g/m²)
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 (=30-50 g/m²)
Wet Road	A road on which traffic produces fine 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 (=50-100 g/m²)
Very Wet Road and Flowing Water on Road*	A road on which traffic produces droplets of water in the air to visibly flowing water on the surface	Greater than 0.1mm (=>100 g/m²)

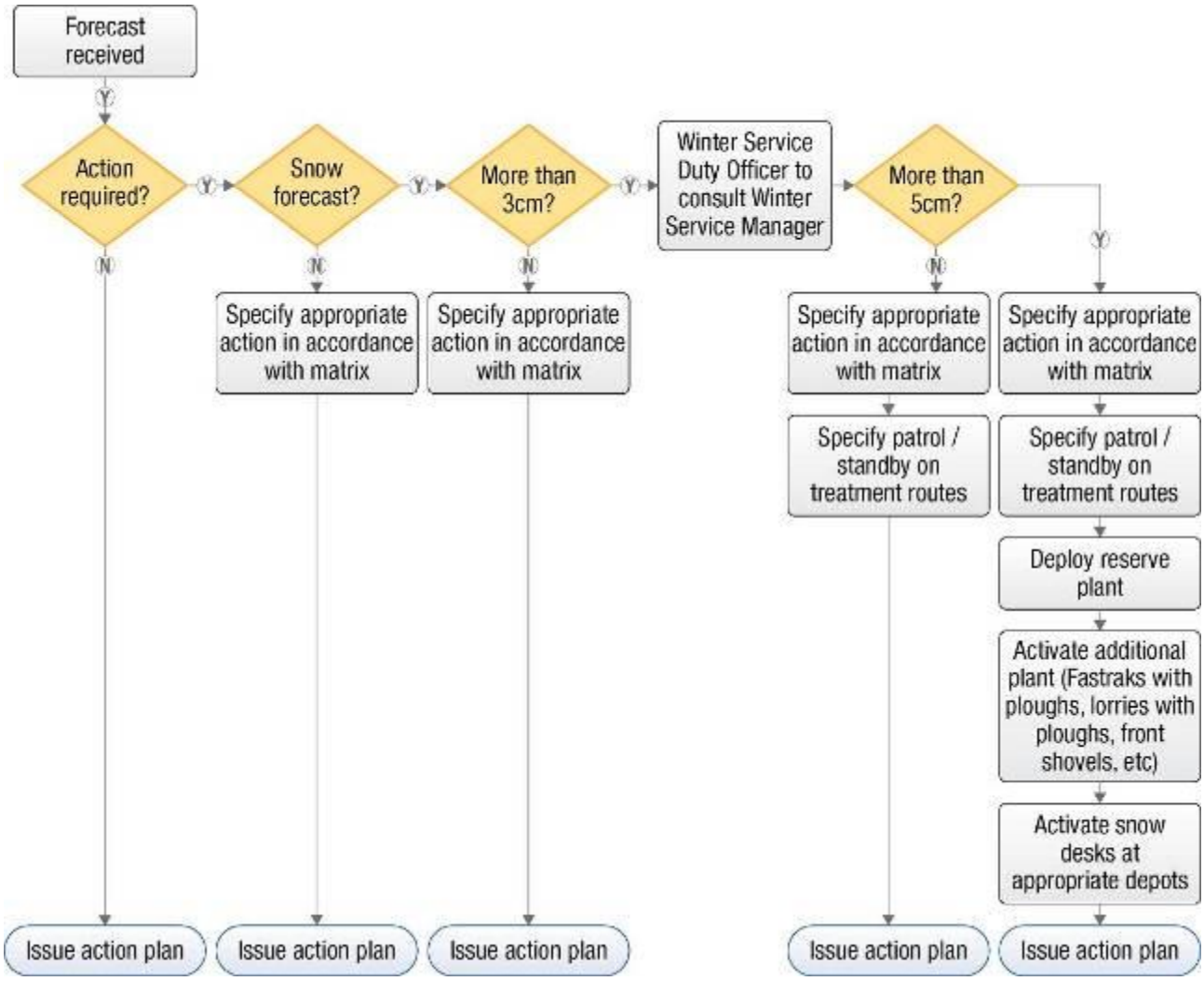
Appendix WSP19 (Table 6.10.2) – Footways, Footbridges and Cycleways – Response Times and Clearance Requirements for Snow or Ice Occurring Together

Table 6.10.2 - Footways, Footbridges and Cycleways – Response Times and Clearance Requirements for Snow or Ice Occurring Together

Categories	General	Between 06.00 and 19.00 hours	Treatments out with daytime hours
A	Between the hours of 06.00 and 19.00, commence snow clearing as soon as practicable to prevent compaction by traffic. Ploughing should be continuous thereafter to prevent a build up of snow.	Clear all snow within 2 hours of snow ceasing to fall. On wide routes, 1.2 metre minimum width shall be cleared initially.	Clear snow when required by the Director.

Appendix WSP20 – Snow Forecast Resource Deployment Matrix

The following domain specific snow event escalation matrix will be used. Consultation will still need to take into account the forecast confidence level, altitude and timing.



Appendix WSP21 – De-icing Materials

De-icing Material (i.e. Dry salt/ABP)	Location	Type (barn/open)	Min (tonnes) 1st Oct
Dry salt	Charlesfield	Covered storage	1,500 T
Dry salt	Bonnyrigg	Covered storage	9,500 T
Dry salt	Burghmuir	Covered storage	4,500 T
Dry salt	Rosyth	Covered storage	5,500 T
Dry salt	Chryston	Covered storage	500 T
Dry salt	Hawick (SBC)*	Covered storage	500 T
Dry Salt	Eyemouth	Covered Storage	1,500T
Dry Salt	Lochgelly	Covered Storage	1,500 T
		Total	25,000 T

Pure salt for brine	Charlesfield	Covered storage	30 T
Pure salt for brine	Bonnyrigg	Covered storage	60 T
Pure salt for brine	Burghmuir	Covered storage	60 T
Pure salt for brine	Rosyth	Covered storage	60 T
Pure salt for brine	Chryston	Covered storage	30 T
Pure salt for brine	Eyemouth	Covered Storage	30T
Pure salt for brine	Lochgelly	Covered Storage	30T
		Total	300 T

Potassium Acetate	Rosyth	Storage Tanks	150,000 litres
		Total	150,000 litres

Magnesium Chloride	Charlesfield	1,000 litre Intermediate Bulk Containers	8,000 litres
Magnesium Chloride	Bonnyrigg	Bulk storage	13,000 litres
Magnesium Chloride	Burghmuir	Bulk storage	12,000 litres
Magnesium Chloride	Rosyth	1,000 litre Intermediate Bulk Containers	8,000 litres

Magnesium Chloride	Chryston	1,000 litre Intermediate Bulk Containers	3,000 litres
Magnesium Chloride	Eyemouth	1,000 litre Intermediate Bulk Containers	3,000 litres
Magnesium Chloride	Lochgelly	1,000 litre Intermediate Bulk Containers	3,000 litres
		Total	50,000 litres

Depot	**Brine Saturator**	**Brine Storage Capacity**	**Total Combined**
Charlesfield	5 m^3 saturator / 25,000 litres storage	0	25,000 litres
Bonnyrigg	5 m^3 saturator / 25,000 litres storage	45,000 litres	70,000 litres
Burghmuir	5 m^3 saturator / 15,000 litres storage	22,000 litres	37,000 litres
Rosyth	5 m^3 saturator / 15,000 litres storage	22,000 litres	37,000 litres
Chryston	5 m^3 saturator / 15,000 litres storage	0	15,000 litres
Eyemouth	5 m^3 saturator / 15,000 litres storage	0	15,000 litres
Lochgelly	5 m^3 saturator / 20,000 litres storage	0	20,000 litres
Totals			219,000 litres

***** These depots will be utilised in snow conditions

Appendix WSP22 – Snow and Ice Clearance Procedures

Carriageway Surfaces

BEAR Scotland will, so far as is reasonably practicable, ensure sufficient resources are available to prevent snow or ice from remaining on the Network, and put into place specific arrangements to ensure that these resources will be available as and when required.

The WSDO, in discussion with the Severe Weather Manager, will determine, from the 2-5 day weather forecast, the requirements to mobilise additional resources. Winter Service shifts and the preparation of de-icing and ploughing equipment will be instructed by the WSDO. Conditions and de-icing spread rates for snow and ice clearance of carriageways are detailed in Appendix WSP18.

The clearance procedure for dual carriageways and motorways will be echelon ploughing (2 or more vehicles moving in the same direction, one behind each other on different lanes). Ploughing techniques to be adopted are shown in Figures 22/1 below.

Ploughing Techniques (Carriageway surfaces)
2 Lane dual carriageway without hardshoulders: The method of clearance, on both carriageways, should be: (a) plough the left-hand lane to the verge; (b) plough the right-hand lane to the central reservation
2 Lane dual carriageway with hardshoulders: The method of clearance, on both carriageways, should be: (a) plough the left-hand lane to the hardshoulder; (b) plough the right-hand lane to the central reservation; (c) plough the hardshoulder to the verge
3 Lane dual carriageway without hardshoulders: The method of clearance, on both carriageways, shall be: (a) plough the centre lane to the left hand lane; (b) plough the left-hand lane to the verge; (c) plough the right-hand lane to the central reservation
3 Lane dual carriageway with hardshoulders: The method of clearance, on both carriageways, shall be: (a) plough the centre lane to the left-hand lane; (b) plough the left-hand lane to the hardshoulder; (c) plough the right-hand lane to the central reservation; (d) plough the hardshoulder to the verge

Figure 22/1: Ploughing Techniques – Carriageway Surfaces

Forth Road Bridge

The clearance procedure for the removal of snow from the Forth Road Bridge deck, would be that ploughs would be set to a level above the surface, due to the presence of the protruding metal bridge deck joints, and echelon ploughing would be carried out across the bridge, with snow being directed as outlined in Figure 22/2. Further continuous treatment with potassium acetate would then be carried out, together with the application of grit, if required.

Snow requiring to be cleared from the Viaduct sections of the Forth Road Bridge would be tackled by directional ploughing from the carriageway to the footway, and from the footways from where the snow would be either transported off site or deposited in a safe location at the

ends of the structure. Forth Road Bridge footways would be closed during snow clearing operations and transport provided, similar to high wind footway closures.

Where hard packed snow and ice not exceeding 20mm thick has formed, and the air temperature is above minus 5°C, removal will be achieved by successive spreading of de-icing material. Below minus 5°C or where the snow or ice is more than 20mm thick, a single sized abrasive aggregate of particle size of 6mm, or 5mm sharp sand and having low fines content will be added to the de-icing material on a 1:1 ratio. Reversion to the use of de-icing material only will be made as soon as possible. Abrasive aggregates will be considered as a supplement on footway sections where de-icing material alone would provide an unacceptably slippery surface.

Ploughing Techniques – Forth Road Bridge
Viaduct. And up to 50 metres before Side Span*   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the right-hand lane to the left hand lane;   (b) plough the left-hand lane to the footway / verge
Side Span (including suspended span).   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the left-hand lane to the grillage / verge;   (b) plough the right-hand lane to the grillage / central reservation
Viaduct. From 50 metres beyond Side Spans*   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the left-hand lane to the footway / verge;   (b) plough the right-hand lane to the grillage / central reservation

Figure 22/2: Ploughing Techniques – Forth Road Bridge

**Over the 50 metres prior to and beyond the Suspended Span, drivers require to alter the angle of the snow plough blade from ploughing to the left to ploughing to the right.*

Queensferry Crossing

Ploughing Techniques – Queensferry Crossing Bridge
Viaduct. And up to 50 metres before Side Span*   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the right-hand lane to the left-hand lane;   (b) plough the left-hand lane to the hardshoulder
Side Span (including suspended span).   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the right-hand lane to the left-hand lane;   (b) plough the left-hand lane to the hardshoulder
Viaduct. From 50 metres beyond Side Spans*   The method of clearance, on both carriageways, should be by echelon ploughing: (a) plough the right-hand lane to the left-hand lane;   (b) plough the left-hand lane to the hardshoulder

Figure 22/3: Ploughing Techniques – Queensferry Crossing Bridge

**If significant snow builds up in edge of the hardshoulder in sections over the shoreline of north and south Queensferry, this shall be pushed, using the V ploughs to the verges off the bridge structure. If the snow builds up on sections over the river Forth, then a snow blower shall be used to move this build up.*

During prolonged periods of snowfall at locations where the use of salt for de-icing is prohibited, ploughing will be continuous followed by repeated applications of de-icing chemical. If snow becomes hard packed, consideration will be given to applying 5mm sharp sand to aid traction while snow clearing operations are During prolonged periods of snowfall at locations where the use of salt for de-icing is prohibited, ploughing will be continuous followed by repeated applications of de-icing chemical. If snow becomes hard packed, consideration will be given to applying 5mm sharp sand to aid traction while snow clearing operations are being carried out.

Ploughing routes will mirror the precautionary treatment routes. In severe weather the priority will be to keep one lane of the carriageway open. When conditions allow echelon ploughing will be utilised to clear all carriageway lanes.

Ploughing will be undertaken in a way to avoid irregular weaving windrows and to ensure completely cleared running lanes with no sudden encroachments, hardshoulder to be completed when running lanes clear.

Forth Road Bridge – Loading Effects of Snow
The critical structural area of the Forth Road Bridge (with respect to snow accumulation and associated loading effects) is the area where the viaduct footway flares to form the side span / suspended span footway. At this location the overall footway width flares from 6.172m (4.648m footway plus 1.524 verge) to 9.144m (4.648m footway plus 4.496 verge / reserve) over a distance of 54m. The critical loading criterion at this point is due to the underdeck stringer beams that are capable of supporting 2No. 3.5T vehicles passing in either direction e.g. total imposed weight of 7T over circa 3No. stringer beams. This is equivalent to circa 130mm deep snow across the panel width.

Appendix WSP23 – South East Salt Tonnage Targets

20 g/m² Treatment Routes						
Route	Min. Tonnage (-10%)		Target Tonnage		Max. Tonnage (+10% for guidance)	
	T2	T1	T2	T1	T2	T1
20R01	7.94	3.97	8.82	4.41	9.70	4.85
20R02	7.13	3.57	7.925	3.963	8.72	4.36
20R03	10.51	5.18	11.67	5.756	12.84	6.33
20R04	9.03	4.52	10.03	5.017	11.04	5.52
20R05	7.97	3.98	8.855	4.428	9.74	4.87
20R06	12.84	6.42	14.27	7.136	15.70	7.85
20R07	11.17	5.59	12.42	6.208	13.66	6.83
20R08	11.32	5.66	12.58	6.29	13.84	6.92
20R09	10.41	5.21	11.57	5.784	12.72	6.36
20R10	9.86	4.93	10.95	5.476	12.05	6.02
20R11	10.83	5.41	12.03	6.015	13.23	6.62
20R12	11.03	5.52	12.26	6.13	13.49	6.74
20R13	7.06	3.53	7.847	3.924	8.63	4.32
20R14	7.80	3.90	8.662	4.331	9.53	4.76
20R15 A	2.26	n/a	2.52	n/a	2.77	n/a
20R15 B	0.97	n/a	1.08	n/a	1.19	n/a
20R16	9.87	4.94	10.97	5.49	12.07	6.03

The routes for the T3 and T4 treatments are different from the T1 and T2 treatments. The T3 and T4 treatments appear on Page 2 of this form. Details of the routes can be found in the Winter Service Plan - Appendix WSP1, especially the tables on pages 39 and 75.

40 g/m^2 Treatment Routes

Route	Min. Tonnage (-10%)		Target Tonnage		Max. Tonnage (+10% for guidance)	
	T1	T2	T1	T2	T1	T2
40R01	2.972	5.944	3.302	6.604	3.632	7.264
40R02	3.211	6.422	3.568	7.136	3.925	7.85
40R03	3.218	6.437	3.576	7.152	3.934	7.867
40R04	3.007	6.014	3.341	6.682	3.675	7.35
40R05	2.806	5.612	3.118	6.236	3.43	6.86
40R06	3.261	6.521	3.623	7.246	3.985	7.971
40R07	3.362	6.723	3.735	7.47	4.109	8.217
40R08	3.245	6.491	3.606	7.212	3.967	7.933
40R09	3.246	6.493	3.607	7.214	3.968	7.935
40R10	2.923	5.846	3.248	6.496	3.573	7.146
40R11	3.049	6.098	3.388	6.776	3.727	7.454
40R12	3.552	7.105	3.947	7.894	4.342	8.683
40R13	3.678	7.357	4.087	8.174	4.496	8.991
40R14	3.11	6.221	3.456	6.912	3.802	7.603
40R15	3.434	6.869	3.816	7.632	4.198	8.395
40R16	3.299	6.597	3.665	7.33	4.032	8.063
40R17	2.928	5.855	3.253	6.506	3.578	7.157
40R18	2.937	5.873	3.263	6.526	3.589	7.179
40R19	2.758	5.515	3.064	6.128	3.37	6.741
40R20	3.362	6.723	3.735	7.47	4.109	8.217
40R21	3.261	6.521	3.623	7.246	3.985	7.971
40R22 A	As 20g treatment route table					
40R22 B	As 20g treatment route table					

Details of the routes can be found in the Winter Service Plan - Appendix WSP1, especially the tables on pages 39 and 75

40 g/m^2 Treatment Routes

Route	Min. Tonnage (-10%)		Target Tonnage		Max. Tonnage (+10% for guidance)	
	T3	T4	T3	T4	T3	T4
40R01	8.9154	11.887	9.906	13.21	10.9	17.45
40R02	9.6336	12.845	10.7	14.27	11.77	15.7
40R03	9.6552	12.874	10.73	14.3	11.8	15.73
40R04	9.0207	12.028	10.02	13.36	11.03	14.7
40R05	8.4186	11.225	9.354	12.47	10.29	13.72
40R06	9.7821	13.043	10.87	14.49	11.96	15.94
40R07	10.085	13.446	11.21	14.94	12.33	16.43
40R08	9.7362	12.982	10.82	14.42	11.9	15.87
40R09	9.7389	12.985	10.82	14.43	11.9	15.87
40R10	8.7696	11.693	9.744	12.99	10.72	14.29
40R11	9.1476	12.197	10.16	13.55	11.18	14.91
40R12	10.657	14.209	11.84	15.79	13.03	17.37
40R13	11.035	14.713	12.26	16.35	13.49	17.98
40R14	9.3312	12.442	10.37	13.82	11.4	15.21
40R15	10.303	13.738	11.45	15.26	12.59	16.79
40R16	9.8955	13.194	11	14.66	12.09	16.13
40R17	8.7831	11.711	9.759	13.01	10.73	14.31
40R18	8.8101	11.747	9.789	13.05	10.77	14.36
40R19	8.2728	11.03	9.192	12.26	10.11	13.48
40R20	10.08	13.446	11.2	14.94	12.32	16.43
40R21	9.7821	13.043	10.87	14.49	11.96	15.94
40R22 A	n/a	2.26	n/a	2.52	n/a	2.77
40R22 B	n/a	0.97	n/a	1.08	n/a	1.19

NOTE:

Details of the routes can be found in the Winter Service Plan - Appendix WSP1, especially the tables on pages 39 and 75

Appendix WSP24 – Drivers' Rotas

Rotas are available in BEARnet using hyperlink below.

https://bearscotland.sharepoint.com/:f:/r/SE%20Records%20Referencing%20System/05/02?csf=1&web=1&e=WbhsPe

WSP25 - List of Winter Plant Registration Numbers

Registration	Depot	Description	Size	Type	Vehicle Use
SN70 XUY	Eyemouth	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVW	Charlesfield	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVP	Charlesfield	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVS	Charlesfield	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVL	Eyemouth	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVJ	Charlesfield	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVM	Bonnyrigg	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVC	Bonnyrigg	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVT	Bonnyrigg	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVU	Bonnyrigg	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVD	Burghmuir	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVG	Burghmuir	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVH	Burghmuir	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVE	Burghmuir	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVO	Burghmuir	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVK	Chryston	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVR	Chryston	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XUW	Rosyth	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline

SN70 XVX	Rosyth	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVY	Lochgelly	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SN70 XVF	Lochgelly	32t Daf chassis	12m3	Econ dedicated Pre-wet	Frontline
SK21 AMX	Rosyth	26t Daf chassis	10,000 L	Econ dedicated sprayer	Frontline
SN70 XZV	Charlesfield	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 YAF	Charlesfield	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 XZY	Bonnyrigg	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 YAA	Bonnyrigg	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 XZX	Eyemouth	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 XZZ	Bonnyrigg	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 YAD	Bonnyrigg	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SN70 XZW	Burghmuir	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SL70 ZVG	Rosyth	26t Daf Chassis	9m3	Econ dedicated combi	Patrol
SL70 ZVD	Rosyth	26t Daf Chassis	9m3	Econ dedicated combi	Patrol
SL70 ZVC	Burghmuir	26t Daf Chassis	9m3	Econ dedicated combi	Patrol
SN70 YAE	Chryston	18t Daf chassis	6m3	Schmidt dedicated Pre-wet	Patrol
SL70 ZVE	Rosyth	26t Daf Chassis	9m3	Econ dedicated combi	Patrol
SN70 XZD	Charlesfield	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve
SN70 YAG	Eyemouth	18t Daf chassis	6m3	Schmidt demount Pre-wet	Reserve
SN70 XZC	Bonnyrigg	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve
SN70 YAU	Bonnyrigg	18t Daf chassis	6m3	Schmidt demount Pre-wet	Reserve
SN70 YAK	Bonnyrigg	18t Daf chassis	6m3	Schmidt demount Pre-wet	Reserve
SN70 XZE	Chryston	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve
SN70 XZB	Burghmuir	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve
SN70 YAJ	Chryston	18t Daf chassis	6m3	Schmidt demount Pre-wet	Reserve

SK21 ANF	Burghmuir	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve
SN70 YAO	Burghmuir	18t Daf chassis	6m3	Schmidt demount Pre-wet	Reserve
SK21 AMU	Rosyth	26t Daf Chassis	10,000L	Econ demount sprayer	Reserve
SK21 AMV	Rosyth	32t Daf chassis	12m3	Econ demount Pre-wet	Reserve

Appendix WSP26 - Salt Resilience Days per Depot

Depot	Current Salt Stock (A) (tonnes)	Resilience (2 x 40 g/m^2 treatments per route, salt only) (B) (tonnes)	Number of Resilience Days (C) C = A/B (tonnes)
Bonnyrigg	**(from Vaisala Manager)**	**217**	
Burghmuir	**(from Vaisala Manager)**	**147**	
Charlesfield	**(from Vaisala Manager)**	**77**	
Eyemouth	**(from Vaisala Manager)**	**53**	
Lochgelly	**(from Vaisala Manager)**	**55**	
Chryston	**(from Vaisala Manager)**	**53**	
Rosyth	**(from Vaisala Manager)**	**81**	
Totals	**(from Vaisala Manager)**	**683**	

Appendix WSP27 – Proposed Winter Trials for Season 2024/ 25

The theme of the last winter season's Transport Scotland Winter Trunk Road Operators Exercise was Sustainability, Innovation and Collaboration. As a direct result of this we developed and undertook the following sustainability initiatives in the SE Unit for the period 22nd January to 31st March 2024.

(i) A 10% reduction in salt spread rates for all carriageway treatments

(ii) Footway treatment activation temperature reduced from +1°C to +0.3°C

Reducing spread rates by 10% resulted in a salt saving of 349 tons over the trial period, whilst salt usage was 3,138 tons. By using less salt, we are reducing the amount of carbon produced in the production and distribution of the salt to its place of final loading before use. Using salt usage data from the first 3 winters of the SE NMC and information from our salt supplier we have theoretically calculated that by using 10% less salt we would have saved 6,234 tons of salt, this would equate to a carbon saving of 380 tons.

For the footway trial reducing the activation temperature to +0.3°C resulted in the number of required treatments dropping from 102 to 48, this equates to a 52.9% reduction. In the SE Unit we treat 41 Km of footway, but due to the linear nature of our network we drive 564 Km to achieve this. As a result of this trial, we drove approximately 30,500 Km less than we otherwise would have, this equates to a carbon saving of some 51 tons.

These trials went well with no issues reported, albeit during the trial period the winter was relatively mild. As such we would like to propose that these 2 trials be continued for the full 2024/ 25 winter season.

Additional trials proposed for 2024/ 25 winter season

Category A & B Patrols Trial

As mentioned in our Winter Annual Report for Season 2023/24 we also intend proposing some trial changes to the Category A & B patrols to reduce their carbon emissions. The patrols carried out in the season just past accounted for 60% of the total carbon produced because of winter vehicle use.

Patrols are currently activated when the RST falls to +2°C or below, however with the accuracy of the forecasts we receive as well as the ability to monitor temperatures with the 38 fixed weather stations spread across the network, we believe this could be reduced further without impacting safety on the network.

Motorways and dual carriageways are constructed to a higher design standard than single c/w routes some of which follow have continued the same alignment since their original construction. There is more positive drainage on the motorways & duals and they do not have the significant gradients or altitudes that some of the single c/w trunk roads have.

We would propose trial activation temperatures as follows;

Dual c/w & motorway	Category A Patrols	+1.4°C and below
Single c/w routes	Category B Patrols	+1.7°C and below

Potassium Acetate on Major Bridges – trial change to treatment matrix

The PA Treatment Matrix (table 6.11.3) currently has only 2 spread rates regardless of the road condition.

15.6 ml/m2 for RST's lower than +1°C but greater than -2°C
31.2 ml/m2 for RST's lower than -2 °C but greater than -5°C

The Precautionary Treatment Matrix for salt/brine (table 6.11.2) allows differing spread rates for the same RST depending on whether the road condition is dry/damp or is wet. We are proposing that we could continue with the 15.6ml/m2 spread rate when the RST is below -2°C when the road is dry or damp. This could be of particular use in periods of very cold weather when there is no precipitation or dew limiting the potential for road hazards to occur. Currently the matrix would lead us to be doing repeated 31.2ml treatments regardless of there being no hazards forecast.
As well as carbon and cost savings, less de-icing chemical spread onto the bridge structures will have a positive benefit on the lifespan of the various components of the bridges.

For all the above proposed trials we would continue to closely monitor their performance against existing standards and collate data in relation to carbon savings and the like as we have done previously.

Appendix WSP28 – Links to Electronic maps of Precautionary Treatment Routes

20R01
https://www.google.com/maps/d/u/1/edit?mid=1LslGq4TD60fv9I_mN8_GqJwo14pZ8kVR&usp=sharing

20R02
https://www.google.com/maps/d/edit?mid=15b3vpKhtEaVBYrhL8hN8LuECOhXkK4Mt&usp=sharing

20R03
https://www.google.com/maps/d/u/1/edit?mid=1NgorqCRyJ2_xywggj1OgJtaAeSU8UDEA&usp=sharing

20R04

https://www.google.com/maps/d/u/1/edit?mid=1BFDXHIXQpmZV6JMDenfhfGli_org5GTp&usp=sharing

20R05
https://www.google.com/maps/d/u/1/edit?mid=1m9UaNsZRGcMFZBQctUOsrJZUsCTz0a2F&usp=sharing

20R06 1 of 2
https://www.google.com/maps/d/edit?mid=1-PxkO3wx3u3WVC46vRukqdzqyJalZ54&usp=sharing
https://www.google.com/maps/d/edit?mid=1dLReYatQCqKyOUxoybdkTBWHsqnIVTA&usp=sharing

20R07
https://www.google.com/maps/d/u/1/edit?mid=1hcmOJlzrX9wJNnXMoboB3ZJUjqdDSTL-&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=1fV1lzinEFEcSCN66ANdB7o9PZ7nLk3w&usp=sharing

20R08
https://www.google.com/maps/d/edit?mid=1OQMk8YyiKDy8EQJKnbmbf7GBPCLZXDMr&usp=sharing
https://www.google.com/maps/d/edit?mid=1v4WnShRF7ENjhalMvVIqzRncdeEmm-I&usp=sharing

20R09
https://www.google.com/maps/d/u/1/edit?mid=1xEHTV6MZCMUds93Lj2EkQHXmBMUcDmPz&usp=sharing
20R10
https://www.google.com/maps/d/u/1/edit?mid=1RWTbWR2X5bIyFELB6M1sIZLi3NGa59q9&usp=sharing
20R11
https://www.google.com/maps/d/u/1/edit?mid=1SYuA7R1xFV_cHYL2mlEuYBZ3vblZcMJ_&usp=sharing

20R12
https://www.google.com/maps/d/u/1/edit?mid=1XX8DSc0w0lNLxZ7CDX5xuSq8Oe1iHUK_&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=17lWBear3M0AbsbhC3UxPmVskyHDcun6q&usp=sharing

20R13
https://www.google.com/maps/d/u/1/edit?mid=1DaqrT55CulvKjl3dr6vpwbc9cg8rBx0&usp=sharing

20R14

https://www.google.com/maps/d/u/1/edit?mid=1dCt1pw0sItO0Y5GYhAyyMgdoa0j-t8s&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=1NKq8a48_Iade3-barJCviH7jxAQoO2M&usp=sharing

20R15A
https://www.google.com/maps/d/u/1/edit?mid=1z5kuXGJt94qUJLtlEiL4MzlEGbllYcVV&usp=sharing

20R15B
https://www.google.com/maps/d/u/1/edit?mid=19RDSryTzEMtcl33MIm9CQLDOjU68z8Kw&usp=sharing

40R01
https://www.google.com/maps/d/u/1/edit?mid=161huVfajwCjveTTy7iBmZdk7Wf3LmFxA&usp=sharing

40R02
https://www.google.com/maps/d/u/1/edit?mid=1cz9eYbwaQDrUTfsDLozSJ5oto6BM_Yn1&usp=sharing

40R03
https://www.google.com/maps/d/u/1/edit?mid=1oACblmlyF4D3maCNgAkcf2aF7AEbpCu7&usp=sharing

40R04
https://www.google.com/maps/d/u/0/edit?mid=1fB6yE6fWCyUOicO_MZzyI9RG3g3CfEk&usp=sharing

40R05
https://www.google.com/maps/d/u/0/edit?mid=1VvMlaxkN3RoRHnP6TKeu05V2hesTv50&usp=sharing

40R06
https://www.google.com/maps/d/u/1/edit?mid=1bIe62rAGEFVMsH-nyaiK8RkwgX43fba0&usp=sharing

40R07
https://www.google.com/maps/d/u/1/edit?mid=1KqVyNQvoVL5CWwq0Qb1sUUpjAfkE5GGI&usp=sharing

40R08
https://www.google.com/maps/d/u/1/edit?mid=1nU5PgbJqIs8NMkvKd8h9t5KRD0ggWCVX&usp=sharing

40R09

https://www.google.com/maps/d/u/1/edit?mid=1BqJxrsaenV0O0kArbhZ-1bb6ppJ-lmkR&usp=sharing

40R10
https://www.google.com/maps/d/u/1/edit?mid=1DjLmMydTXKOkX__Yf4_k3QJQKrbxCHdg&usp=sharing

40R11
https://www.google.com/maps/d/u/1/edit?mid=1DmficscG7Cjmw59O3Cy5QdplFz8Tys6v&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=1-Oq7_MMc6y9zL7VbnsdWJZVkL_zm6xOw&usp=sharing

40R12
https://www.google.com/maps/d/u/1/edit?mid=1jiMyd1bo7H8NL3P_gkcWygWurAEBUdTE&usp=sharing

40R13
https://www.google.com/maps/d/u/1/edit?mid=1nftJ2Wsdueu7mrTO3oBhkfc_MnnvTY82&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=1w82aHglfFZ0b6HyZvpXE8-2xPBjmvV3k&usp=sharing

40R14
https://www.google.com/maps/d/u/1/edit?mid=10bCweGpQ1yuDfEXSO8eZS4DgmV0ORa01&usp=sharing

40R15
https://www.google.com/maps/d/u/1/edit?mid=1Q4CCFrRbCsePr1-Ws52hlk2RcIf0mLyy&usp=sharing

40R16
https://www.google.com/maps/d/u/1/edit?mid=1XbuENw_QygKHgI9FNRcJMiA5A5qwXQY&usp=sharing

40R17
https://www.google.com/maps/d/u/1/edit?mid=1YC7SNuv_Ivb54rM0h-7F8wdo-MucjqBn&usp=sharing

40R18
https://www.google.com/maps/d/u/1/edit?mid=1qVCwQvAQ3uGOHB3z5ak_p44KFbrtdfRu&usp=sharing

40R19
https://www.google.com/maps/d/u/1/edit?mid=1ow2Payd-EDu-oK_g3vsLix6Dp-inOeLw&usp=sharing

40R20
https://www.google.com/maps/d/u/1/edit?mid=1P5Mi1or1y3zOceLljxXGOquB5RpJRmfu&usp=sharing
https://www.google.com/maps/d/u/1/edit?mid=1SMq4FzdsWltnQXtMfHp9H-9j0i10wiu9&usp=sharing

40R21
https://www.google.com/maps/d/u/1/edit?mid=1IgdNG15zhm415pmedMSQCtFG7iRjNb5N&usp=sharing

40R22 A
https://www.google.com/maps/d/edit?mid=1BgHDtxE-lb1uTEKkd-OJOldJOtRck7Op&usp=sharing

40R22 B
https://www.google.com/maps/d/u/1/edit?mid=1Vf5xs7Ap60hfoY4_3enoOuNz4wbX9BrX&usp=sharing

Appendix WSP29 – Resilience Precautionary Treatment Routes

	Depot	Description	Depot to Route (km)	Time to Route (mins)	Total Route Length (km	Total Route Length Treated (km)	Aver Speed (km/hr)	Route Time (mins)	Route to Depot (km)	Route Efficiency	Average Width of Route	Alternative Access	Route Tonnage @ 10 g/sqm (tonne)	MAX SPREAD RATE FOR 12 m3 vehicle(g/sqm)	Treatment type
SE20R01	Charlesfield	A6091 Ravenswood to A7 English Border	5.3	6	81.7	81.7	48	102	87		7.3	Bonnyrigg	6.0	25	Pre-wet salt
SE20R02	Bonnyrigg	A720 Millerhill to A68 English Border	8	8	83	83	56	89	91		7.4	Charlesfield	6.2	25	Pre-wet salt
SE20R03	Bonnyrigg	A720 Sherrifhall to A1 English Border	6.4	6.4	282	153.2	64	265	6.4		8.7	Eyemouth	13.3	11	Pre-wet salt
SE20R04	Bonnyrigg	A720 Sherrifhall to Hermiston and A702 Hillend to Abington	6.4	6.4	157	115	56	168	6.4		6.4	Burghmuir	7.4	20	Pre-wet salt
SE20R05	Burghmuir	M8 and M9 as per route card	10.7	10.7	258.2	116.8	68	228	10.5		10.2	Chryston	11.9	12	Pre-wet salt
SE20R06	Burghmuir	M9 as per route card	1.1	1.1	221.8	114.5	68	196	13.5		10.3	Rosyth	11.8	12	Pre-wet salt
SE20R07	Rosyth	M90, A985, M80, M876 as per route card	2.1	2.1	286.2	137.5	60	286	24		9.8	Lochgelly	13.5	11	Pre-wet salt
SE20R08	Rosyth	Clackmannanshire Bridge, Kincardine Bridge, Queensferry Crossing and Forth Road Bridge as per route card	3.6	3.6	105.5	38.6	56	113	20.7	25%	7.3	Burghmuir	4393 litres	NO CHANGE TO PA ROUTE CARD	Potassium Acetate

Appendix WSP30 – Vulnerable Locations Review (updated July 2024)

Location	Vulnerable Location type i.e. gradient, run-off, frost	Detail	Proposal/Evidence

A1 Dunbar to Houndwood	Water run-off	There are several locations within the section of c/w Dunbar to Houndwood (as noted in the Drainage Strategy) where water flows from adjacent land during periods of prolonged heavy rain.	Length of vulnerable location reduced as identified issues are all between Dunbar and Houndwood. No issues over last 4 winter seasons in any other areas out with named section.
A6091 Newstead	Water run-off	Was newly added after 2020/21 winter season due to water run-off from 3rd party access onto trunk road, drainage work completed previously, no repetition has occured	Has now be removed from list in WSP.
A68 Fala Mains (not north of Fala)	Water run-off	Water run-off from 3rd party track/ banking onto trunk road	Remain on list of vulnerable locations
A7 North of Teviothead at Priesthaugh Junction	Water run-off	No change	There are several locations within the 17 mile section of c/w Skippers Bridge to Priesthaugh junction (as noted in the Drainage Strategy) where water flows from adjacent land during periods of prolonged heavy rain. These have been combined into 1 vulnerable location in the WSP
A7 North of Skippers Bridge nr Langholm	Water run-off	No change	
A7 South of Langholm at entrance Sewage Treatment Works	Water run-off	No change	
A702 Immediately north of Silverburn	Frost susceptible	Remove all frost susceptible area from the Vulnerable Locations list . Frost susceptible areas have been in the Contracts historically, from 2G through to 4G and now the NMC, the winter specification and treatment matrix have been developed through time to prevent the formation of frost/ ice on the c/w	Routes are always treated when the forecast RST is less or equal to +1C, spread rates also increase the colder it gets, also in the NMC all routes on the network have a Category A or B patrol during high risk periods for frost. With the above in place there is no evidence to suggest that any areas on the network are more frost susceptible than others
A702 north of Abington	Frost susceptible		
A9000 Forth Road Bridge	Frost susceptible		
M8 J3 – J5	Frost susceptible		
A68 Huntsford Bends to Carter Bar	Frost susceptible		
A68 Pathhead to Soutra	Frost susceptible		
A68 South of Soutra to Carfraemill	Frost susceptible		
A7 Newmills to Castle Hermitage junction	Frost susceptible		
A702 south of A703 junction to north of West Linton	Frost susceptible		
A702 Candymill to north of Coulter	Frost susceptible		
A7 Auchenrivock	Significant	Relatively low lying 50 –	Auchinrivock section does

Improvement	gradient	100m a short section of gradient has caused issues in the past for HGV's during heavy snow. Just to the south of Langholm should be combined with the section north of Langholm, Hermitage junc to Newmill where altitude is 250 – 300m	not generally get significant snowfall as relatively low lying so scope to create longer vulnerable location section. Contract requires frontline and Category B patrol vehicles in place for any snow accumulations, for slight accumulations of less than 0.5cm over several hours there is no evidence to suggest further resources are required
A68 Soutra	Significant gradient	No significant change given long gradients and altitude 250 – 300m.	Contract requires frontline and Category B patrol vehicles in place for any snow accumulations, for slight accumulations of less than 0.2cm per hour there is no evidence to suggest further resources are required
A68 Carter Bar	Significant gradient		
A68 St Boswells to Ancrum	Significant gradient	No significant change, an altitude of less than 150m this section of c/w undulates up and down with a series of short gradients, vehicles slowing/ stopping to turn right can cause traction issues for following HGV's.	Contract requires frontline and Category B patrol vehicles in place for any snow accumulations, for slight accumulations of less than 1.0cm over several hours there is no evidence to suggest further resources are required
A720 Calder to Baberton	Significant gradient	No significant change given long gradient on very heavily trafficked section, altitude 150 – 200m.	Contract requires frontline and Category A patrol vehicles in place for any snow accumulations, for slight accumulations of less than 0.2cm per hour there is no evidence to suggest further resources are required, previously experienced difficulties including season 2020/21 have occurred during heavy snowfall
M8 Livingston to Duntilland	Significant gradient	No significant gradients on the M8 J3 – J5, however altitude varies from 100m – 220m, as	Contract requires frontline and Category A patrol vehicles in place for any snow accumulations, for

		it's an inland section it can be prone to significant snow accumulations. Need to deploy reserve vehicle for overall accumulations of less than 0.5cm should be considered	slight accumulations of less than 0.2cm per hour there is no evidence to suggest further resources are required

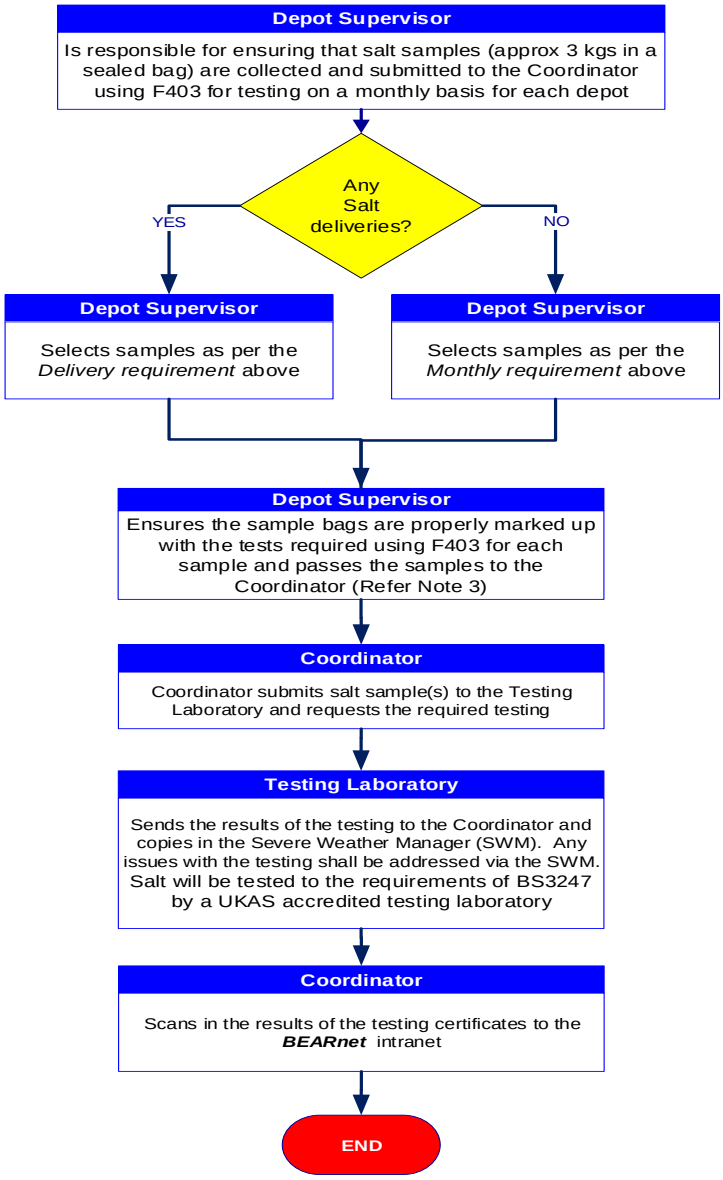
Appendix WSP31 – Salt Testing (Procedure 093SE)

Delivery Requirement **(sampled within 10 days of delivery)**

Moisture Content (1 test per 500 tonnes)
Particle Size Distribution (1 test per 500 tonnes)
Chloride Content (1 test per 1500 tonnes)
Soluble Sulphate (1 test per 1500 tonnes)

Monthly Requirement **(October – May inclusive)**

Stockpiles in Covered Structure
Moisture Content – (1 test per month from base of the salt pile)



NOTE 1
A delivery is defined as per boatload not for every lorry load that arrives

NOTE 2
The salt testing carried out at the shared depot of Chryston represents both Units

NOTE 3
Bonnyrigg Depot Supervisor - Coordinator for the specific SE depots, Bonnyrigg, Burghmuir, Charlesfield, Rosyth and the shared Chryston depot.

Passes the collected samples to Highland Council for testing

NOTE 4
Any test results not meeting the required specifications (eg moisture content greater than 4%) shall be notified to the Severe Weather Manager who shall take the necessary steps to ensure compliance with the requirements of Schedule 2 Section 6, 6.4.4

NOTE 5
The Severe Weather Manager, who orders the salt, shall notify the Depot Supervisors of what samples need to be taken for sending for test.

Appendix WSP32 – Consultation Certificate (#25SE)/Minutes of Consultation Meetings (TS confirmed that minutes will suffice, certificates are not required)

CERTIFICATE NUMBER: ConsultC NMC SE WSP 20/21

Order Reference : N/A …… Scheme Identifier: N/A ……..

Scheme Title: N/A …….. Route: N/A …..

1. We hereby certify to the Scottish Ministers in respect of:

Schedule 2 Section 6 Winter Service

that we have consulted with ……. (Name of Consultee) and have ascertained that they have no objections to the document as listed in part 2. below.

We agree that the words and phrases herein, unless otherwise stated, have the same meaning as attributed to them in this Contract between the Scottish Ministers and the Operating Company.

Signed ……..

Firm BEAR Scotland Limited …….
(On behalf of Operating Company)

Name …… Date …… ……
(Block Capitals)

2. LIST OF CONSTRUCTION DOCUMENTS

Draft Winter Service Plan for the South East Unit 2020/21

3. DECLARATION BY ……(Name of Consultee)

On behalf of …….. (Name of Organisation) I confirm that:

(i) consultations referred to above have been completed as indicated above.

(ii) …….. (Name of Organisation) has no objections to the document listed in part 2. of this Consultation Certificate, and

(iii) the document listed in part 2. of this Consultation Certificate meet all known requirements of the consultee

Signed ……..

Name ……
(Block Capitals)

duly authorised to sign on behalf of ……(Name of Consultee)

Date ……..