

Winter Service Plan

2017 to 2018

Operational Details



**Roads Division
Place Directorate**

WINTER SERVICES SUPPLEMENT WINTER SERVICE POLICY AND PROVISION FOR 2017/2018 REPORT No ~~267/17~~

OPERATIONAL DETAILS

Well-managed Highways – Code of Practice Part B – Highways Oct 2016 current version recommends the following are included in the Authority's Winter Service Policy and Plan.

Statement of Policies and Responsibilities

- Policies and priorities – as set out in 17/18 Committee report.
- Client and Service Provider risks and responsibilities:

The Client (Angus Council) is responsible for decision making and the Contractor (Tayside Contracts) for undertaking the works requested. The Contractor is also responsible for the training of operatives carrying out gritting and snow clearing and checking the road worthiness of the plant used.

- Decision making process and responsibilities:

Decision making will be based on the chart enclosed subject to local knowledge and experience.

- Liaison and communication arrangements with other authorities and other public services:

Daily action plans are exchanged with the Trunk Road Authority's agent (BEAR Scotland Ltd) and Perth & Kinross Council with whom there are several cross boundary agreements. With regard to Dundee City and Aberdeenshire Councils with only minimal cross boundary gritting arrangements contact only takes place by telephone as and when required. Routes were originally set to ensure consistency with all neighbouring authorities.

- Winter risk period:

The winter risk period is detailed as 30 October 2017 to 30 March 2018 with 3 week lead in and out times with reduced treatment coverage. (Core period 1 Dec to 1 Mar)

- Resilience standard:

Resilience Standard – 2.5 weeks 5,500 Tonnes of salt

- Legislative background:

Roads (Scotland) Act 1984 Section 34.

Route Planning for Carriageways, Footways and Cycle Routes

- Carriageway routes by risk level:

The Plan includes carriageway routes for pre-treatment (i.e. priority routes/Category 1) – min winter network; carriageway routes for post treatment by risk level (auxiliaries/Category 2 and non priorities/Category 3). Carriageway routes for snow clearing by risk level are as for pre treatment, etc., as above.

- Response and treatment times for all carriageway treatments:

1 hour response time from when called at home to get to depots.

- Routes for footbridges, subways and other high risk pedestrian areas:

Footway routes for treatment by risk level which include high risk pedestrian areas (priority/Category 1) – min winter network; and then other non priority footway routes (Category 2) by risk level are also detailed.

- Response and treatment times for footway and cycle route treatments:

As soon as practicable

- Routes for other footways and cycle route treatment by risk level:

Cycle route treatment is covered within footway and carriageway treatment routes in the relative priorities.

- Allocation of plant, vehicles, equipment and materials to routes:

Information available within this document or from Contractor, Tayside Contracts

- Location and maintenance of salt bins and grit heaps:

Grit bins are listed in the Manual (to be listed before start of winter).

- Special sites or features (e.g. near railways or traffic calming):

Special sites or features (e.g., near railways or traffic calming) are treated as part of the footway or carriageway routes. Level crossings are not treated between the gates.

The A92 Arbroath to Dundee carriageway and cycleway is treated as a priority by the managing agent.

Weather Prediction and Information

- The decision making process:

The decision making process is detailed in the Quality Assurance procedure included. A decision matrix is included.

- Road weather information bureau service:

Vaisala provide a road weather information bureau service and maintain the ice stations.

- Road weather stations:

Road weather stations are detailed within these Operational Details

- Timing and circulation of information:

As detailed in the Quality Assurance procedure process included.

- Road weather forecast:

Road weather forecasts will be provided by a specialist forecaster – currently at tender through Tayside Procurement Consortium.

- Reporting procedure:

Information which is provided is detailed on the daily action plan which is circulated to various parties daily through the winter period.

This action plan is normally circulated before 2:00 pm every day through the winter period.

Details of gritting start and finish times, salt usage; and plant and labour used are maintained for reference by the Maintenance Section.

- Thermal mapping:

Thermal mapping has been undertaken.

- Maintenance of ice detection equipment:

Ice detection equipment is maintained under contract by Vaisala currently.

Organisational Arrangements and Personnel

- Command, control and operational organisation:

The Quality Assurance procedure covers decision making, record keeping, reporting, standard operating procedures and operational monitoring including command, control and operations organisation including employee roles and responsibilities.

- Arrangements with other authorities:

Liaison regarding forecast with neighbouring authorities takes place regularly (Perth and Kinross (PKC); Dundee City Council (DCC) and Aberdeenshire Council (A'shire))

- Arrangements with other public services:

Liaison takes place with the Emergency Planning Section of the council in poor conditions and generally through them with the Police.

- Decision making:

Recorded.

- Operational record keeping and reporting:

Recorded.

- Plant and vehicle manning arrangements, including management of drivers' hours regulations:

By Tayside Contracts

- Materials management:

Materials management in terms of stocks of salt held, location and re-ordering are as detailed here. Salt ordered and stored by Tayside Contracts. All Scottish Authorities share information regularly throughout the winter period on salt stocks and levels of resilience.

- Training and development arrangements:

Training and development arrangements for operatives are carried out by Tayside Contracts. Angus Council client staff receive appropriate training in terms of forecast interpretation etc., and decision making. Regular refresher training takes place 3 yearly normally.

- Schedules of Staff Contacts, Contract and Voluntary Personnel (CVP):

Schedules of Staff Contacts, contract and voluntary personnel in terms of self help ploughs are listed in the Operational Details (to be listed before start of winter).

- Employee roles and responsibilities:

The guidelines on supply of ploughs to self help operators are also detailed in the Operational Details (to be listed before start of winter).

- Contact and commissioning arrangements for CVP:

As above.

- Employee duty schedules, rotas and standby arrangements:

Duty schedules, rota, and standby arrangements will be detailed prior to the start of the winter period by Angus Council and Tayside Contracts as appropriate.

- Winter Service exercising arrangements:

The council does not undertake exercises to test its capability due to the high level of operational activity annually.

- Standard operating procedures:

Regarding escalation and emergency operating procedures and contingency arrangements these issues are addressed in the Committee Report.

- Escalation and emergency operating procedures:

As above.

- Operational monitoring:

As Quality Assurance procedure

- Health and safety procedures:

With regard to Health and Safety, contractors are required to follow current legislation. Angus Council client staff are required to follow relevant Safe Working Procedures. Driver training need is monitored to enhance experience already gained by staff 'in the job' for many years.

- Contingency arrangements.

As above.

Facilities, Plant, Vehicles and Equipment

The following are dealt with by the Contractor, Tayside Contracts:

Winter Service compounds and facilities;
 Calibration procedures;
 Fleet inventory including licence requirements and capacity;
 Fuel stocks and locations.

Location of plant, vehicles, snow blowers and other equipment;
 Contingency arrangements;
 Garaging, servicing and maintenance arrangements;
 Contract and hire arrangements for contract plant
 Sufficient capacity is deemed available to cover for breakdown for priority carriageway. No cover for footway. Tayside Contracts expertise is relied on in the purchase of specialist equipment, driver training, drivers hours, calibration of equipment, etc. Also the best value hire of additional equipment.

Salt and Other De-Icing Materials

Similarly the following are generally dealt with by Tayside Contracts (TC) unless noted otherwise as follows:

Location and capacity for stocks of salt and other materials;
 Contracts and purchasing arrangements for supplies;
 Min pre season and in season stock levels (Angus Council (AC) and TC joint checks); via weigh bridge.
 In season re stocking arrangements (AC see restocking table);
 Testing arrangements;
 Stock level monitoring (TC) and forecasting procedures (by AC staff);
 Loading arrangements;
 Treatment requirements including spread rates detailed in the Plan are determined by Angus Council staff in the action decision making procedure. Angus Council also determines minimum pre season salt quantities and restocking levels while Tayside Contracts carries out stock level checks.

Operational Communications

Communication issues are noted in the Report.

Mobile telephones are used by both client and contractor staff.

Gritter drivers are required to either text or telephone client supervisory staff at the start during and at the end of each route to detail timescales, tonnages of salt used and any problems or poor conditions encountered.

Contingency Plan

See Committee Report 17/18

Salt supply through Tayside Contracts/ other/ salt conservation measures – see Committee Report 17/18

Additional plant brought in as required

No minimum networks (Priority networks can be used as minimum winter networks).

Mutual aid through TC network – PKC/DCC

Business Continuity Plan in place for Winter Maintenance

Cat1/2 responder's discussion through Emergency Planning

Information and Publicity

Local press and broadcast contract information - this is dealt with through the council's Communication Team

Leaflets – produced and supplied annually.

Information placed on council's website.

Other key local and national contact information - through Communications Team.

Public Self help – The council is prepared to provide salt and guidance for groups prepared to carry out self help. Also grit bins are provided for self help on public areas.

Thermal mapping – completed a number of years ago.

Responsibilities and guidance for providing information - as above. Client staff update the Council's intranet site in snow conditions for roads blocked, etc.

The decision making process - as Quality Assurance procedure.

Information to be provided - as Quality Assurance procedure.

Road weather stations – included in Operational Details.

Road weather info bureau service – Vaisala at present.

Timing and circulation of information - as Quality Assurance procedure.

Road weather forecast - as Quality Assurance procedure.

Notification arrangements for failure to maintain the published network – through Communications Team as required.

Reporting procedure - as Quality Assurance procedure.

Maintenance of ice detection equipment - Vaisala at present.

Quality Management

- Quality management regime including regular service audits;
- Document control procedures;
- Distribution of documents;
- Information recording and analysis;

- Arrangements for performance monitoring, audit and updating - through BSI
- Procedure for deviation from the Winter Service Plan; - Committee Report 17/18
- Service Review following significant events and at the end of season.

Quality Management Angus Council has Quality Assurance for winter maintenance with records kept of who documents are distributed to.

A local performance indicator exists for percentage of occasions when gritting commences within instructed time. Target 100%.

Salt usage is recorded and checked against targets and reviewed and reported and routes re run if necessary.

Quality Procedure

- 1.1 Duty Officer (officer with authority to decide on what action to take in relation to weather conditions) shall devise an action plan daily around lunchtime based on information available – namely from weather forecast (received from Council's weather forecast provider); from Ice Alert stations; from Thermal Maps; from local knowledge (own and reports from Supervisors); and from knowledge of plant availability and treatment techniques and capabilities. He/she shall then update this action plan as necessary through the next 24 hours as conditions and knowledge change.
- 1.2 He/she shall distribute the action plan (decision on action to be taken to deal with weather conditions) to the relevant interested parties including the Contractors required to undertake the work; other authorities bounding Angus and to management and staff involved with the service.
- 1.3 The appropriate Roads Management staff (Superintendent and Supervisors) shall then monitor that the work (gritting and snow clearing) is provided as required and is modified as necessary in light of updates and emergencies.
- 1.4 Staff shall keep records of forecasts/action taken/complaints and any other relevant information. These records are maintained on specialised forms and associated spreadsheets for priority fixed rate treatment routes; priority variable rate; auxiliary; weekend auxiliary; non priority- 3 areas; footway – 3 areas; snow – 3 areas; external costs; grit bins and piles salt and salt deliveries.
- 1.5 Budget monitoring shall be carried out in accordance with the Financial Control procedure.
- 1.6 Annually the Winter Maintenance Policy and Service Provision shall be reviewed and reported to Elected Member Committee for approval.

- 1.7 Each year the plant available shall be checked and renewed, extra provision and maintenance needs, together with costs, are agreed with Tayside Contracts.
- 1.8 The weather forecast service provision and Ice Alert station maintenance and calibration service shall be reviewed regularly.
- 1.9 Prior to the Winter Maintenance period (which normally runs between the 3rd week in October until the end of March) publicity on the service provided and advice on driving shall be issued to the public and other stakeholders by means of press release and a leaflet.

Service Resilience

A resilience standard is recommended of 6 days of 6 treatments per day of the priority network at 20g/sqm during the core winter period (1 Dec to 1 March). For Angus say 5,500Tonnes. Angus aims to achieve this.

Winter Maintenance Service

1. Level of Service

Winter maintenance has historically been carried out by the local councils' Direct Labour Organisations (DLO's), and a balance has to be struck between the level of service which can be provided on winter maintenance and the manpower resources which can be gainfully employed on other work during periods of more clement weather in winter, and which can also be sustained during the rest of the year taking into account the overall financial resources available to the council and the potential workload available to the DLO from all client sources.

In order to maintain the balance between the workforce required for summer and winter activities, other cyclic maintenance work (e.g. gully cleaning, emergency patching, drainage investigation, etc) and a proportion of routine and structural road maintenance work is awarded without competition to Tayside Contracts.

In order to ensure value for money on these awarded work activities the prices quoted by Tayside Contracts are benchmarked against prices for similar work obtained through competitive tendering where possible and for other activities where there is no viable external provider (e.g. winter maintenance) through benchmarking with other Councils or cost plus.

In this way, maximum use is made of Tayside Contracts available resources. In prolonged snow conditions it may be necessary to supplement these resources by the re-deployment of Parks operatives or by employing private contractors to assist with snow clearing.

Discussions with Tayside Contracts on the fixed costs and operational rates for the coming winter are currently in hand and the Head of Technical and Property Services anticipates that the level of service proposed in Appendix 1 can be contained within the available budget subject to the weather conditions which prevail over the winter period.

Appendix 2 details the normal level of plant and vehicles available.

2. A90 Trunk Road

Responsibility for maintenance (including winter maintenance) of the A90 Trunk road within Angus rests with the Scottish Government and the day to day operational management and maintenance is carried out on their behalf by BEAR Scotland Limited.

BEAR provide 24 hour cover on the A90 between 1 October and 15 May (inclusive). Report No. 1345/01 presented to the Roads Committee on 22 November 2001 authorised operational decisions at officer level taking into account all prevailing circumstances whereby assistance may be provided to BEAR Scotland Limited in clearing snow from the A90.

There has been no requirement to assist BEAR during previous winter seasons.

3. Assistance from Other Departments/Sub-Contractors

Tayside Contracts undertake the winter maintenance service and are assisted through sub-contracts and other sections.

Other sections also have responsibility in the interests of public safety for winter maintenance on the areas which they look after (e.g. schools, parks and cemeteries, council owned housing schemes, day-care centres, etc).

On occasions winter weather and in particular snow conditions can prevent normal work activities (e.g. street sweeping, ground maintenance, other paid contract work, etc) from being carried out and therefore any available additional resources from the Parks, etc workforce can be usefully employed to assist with snow clearing on public roads. In these circumstances payroll costs are allowed for within the Parks, etc budget. Overtime payments however which have not been otherwise budgeted for have to be charged to the Roads winter maintenance budget.

Tayside Contracts also employ other sub-contractors from the local farming community. These operators are local based and treat selected routes on a routine basis. Details of the routes treated by farmers are given in Appendix 1. Sub-contractors have been assessed to ensure health and safety requirements are fulfilled. Existing sub contracted farmers and relief drivers are currently offered a contribution to gaining the correct driving licences for themselves and staff to ensure availability in terms of sickness and holiday to operate the scale of plant needed.

4. Communications and Publicity

4.1 Mobile Telephones

Good communications are vital in the control of winter maintenance operations. Both Tayside Contracts and Angus Council Roads staff rely on mobile telecom technology throughout the winter.

4.2 Liaison with the Police

In severe weather conditions liaison with the police must be maintained at all times. The police in turn collate this information together with feedback from their own patrols and other sources and forward details to the media, motoring organisations and other emergency services, etc. These arrangements have worked well in previous years and will continue.

4.3 Publicity

In order to provide the public with information regarding the level of service to be provided and to help to ensure that the public's expectations are reconciled with the council's policy and available resources it has been customary to publish details of the hours of cover, priority routes, winter maintenance policy, etc in advance of the start of the winter maintenance period through press releases, leaflets, etc. For maximum impact this information will be released around the middle of October.

During heavy snow conditions (and indeed other severe weather emergencies) the council's Communications Unit will be supplied with general background information in support of press releases and social networking. This information will be provided by the Head of Technical and Property Services. Information on roads "closed", "open" and "passable with care" is made available to allow departmental managers to make decisions affecting their staff and to the ACCESSLine staff to allow them to advise callers. This is updated during office hours in severe weather conditions.

5. Technical and Property Services Supervision of Winter Service Operations

The Technical Property Services Department has out-of-hours arrangements through standby rotas within the Roads Maintenance section to supervise winter service operations, monitor road conditions and weather forecasts, and deal with emergencies. The costs of standby allowances, etc are allowed for within the section's budget.

6. Ice Prediction System

The council has a computerised Ice Prediction System based on real-time data received from automated "outstations" which measure weather conditions and road surface state at dispersed locations on the road network. These outstation monitoring points are located at:-

- Balgavies on the A932 between Forfar and Friockheim
- Balshando on the A923 between Muirhead and Coupar Angus
- Forebank on the A933 between Brechin and Friockheim
- Upper Dysart on the A92 between Inverkeilor and Montrose
- Upper Victoria on the A92 between Monifieth and Muirdrum
- Lochlair on the B9128 between Craichie and Muirdrum
- Ruthven Crossroads between Alyth and Kirriemuir

Information from additional outstations on the Trunk Roads and within adjacent council areas are also accessible to staff.

These remote outstations record and transmit data to central bureau computers operated with technical support by the council's Ice Prediction System service provider. This data can then be accessed by computers to download information on:-

- Road Surface State (dry, moist, wet, frost, black ice, snow)
- Road Surface Temperature
- Below-surface Road Temperature
- Air Temperature
- Dew Point
- Relative Humidity
- Precipitation Intensity
- Wind Speed and Direction *
- Gust Speed*
- Presence and Concentration of Salt

(*Not recorded at Forebank, Lochlair, Upper Victoria, Balshando or Ruthven)

The "outstations" are maintained and calibrated by a consultant Vaisala.

As well as being available via computer screens in real time to Angus Council's roads maintenance staff responsible for the day-to-day management of winter service operations, the data from the "outstations" is also made available to the weather forecast service provider to allow computer generated weather forecasts (both area based and site specific).

These forecasts allow prediction (with approximately 85-90% accuracy) of sub-zero temperatures and (with approximately 50% accuracy) the probability and depth of snow.

The site-specific forecasts are linked via computer modelling to the thermal mapping data (undertaken several years ago) which was compiled for the priority route network to allow extrapolation of road surface temperatures, both actual and predicted, over the whole network. This in turn allows much greater confidence and accuracy in decision-making regarding where, when, and how much salting is required to prevent ice forming on priority routes with consequent economies in salt usage without any reduction in service or safety.

7. Salt and Gritting Materials

7.1 Salt Specification

Salt is ordered through Tayside Contracts. Tayside Contracts order salt for Angus Council, Dundee City Council and Perth and Kinross Council and therefore gain the benefits of economies of scale. Salt for road purposes varies depending on the source of supply. Particle shape, size grading, uniformity, insolubles (clay/dirt) content, tendency to "cake", resistance to weathering, spreadability, etc all vary depending on the source. Trials in the past have shown that 6mm imported marine salt, although more expensive than UK mined salt, has superior purity and weatherproof qualities (can be stored uncovered with good thatching properties).

However in recent years escalating shipping costs together with a fluctuating exchange rate has led to increasing marine salt costs. This combined with improvements in the quality of mined UK (rock) salt and its lower price in comparison to marine salt has led to a strategy of using both marine and rock salt.

7.2 Storage

Marine salt for road use to BS3247:1991 is supplied with an anti-caking chemical additive which is designed to prevent the salt consolidating into a solid mass in a stockpile or clogging the delivery system in a gritter. A useful side-effect of this is that when this chemical is washed through the outer layer of the stockpile by rain the remaining additive-free salt forms a crust which then protects the rest of the stockpile from further weathering.

Given the cost differential between marine and rock salt and with the need to cover rock a business case for a 6,000 Tonne barn was developed and built in Forfar in the autumn of 2011.

7.3 Salt Stock Holdings

The rules of "supply and demand" apply to the purchase of salt in a similar way to other commodities. Advance orders for salt delivered during the summer months can be purchased at more favourable rates than salt ordered during the height of winter. The marine salt used is imported and delivery (by boat) is fairly slow and not geared up to urgent orders. It is prudent therefore to store supplies of salt in advance of winter in sufficient quantity to meet the anticipated need for the whole of the winter service period. 19,000 tonnes of salt has been ordered for the winter of 2017/18 including 6,000 tonnes of rock salt for Forfar stored in the barn and the remainder marine salt stored outside at Forfar and Arbroath with a small holding at Brechin. In severe winters however, where salt levels fall below predetermined levels at specific times through the winter period additional salt will be ordered in. Experience of an excessively bad winter has shown 5,500 Tonnes of salt

could be used at peak usage, therefore this has been recommended as a minimum to be held to the end of March to cope with any bad spell of weather at any time of year. Tayside Contracts are responsible for purchasing and stockpiling the salt. Measurement of use is by weighbridge at the depots in Forfar and Arbroath.

7.4 Salt Usage

Weighbridges are used in Forfar and Arbroath to determine salt usage. To reduce human error weighbridge software has been installed at Arbroath and Forfar. Live monitoring of vehicles is leading to reduced administration of stock control.

8. Self-Help Schemes

8.1 Grit Bins

The provision of grit bins for use by the local community offers a practical low cost supplement to the use of the council's own limited resources. However grit bins also have disadvantages:-

- keeping bins filled puts additional pressure on stretched resources during continuing severe weather conditions
- some grit bin locations have a history of vandalism and litter nuisance
- salt/grit provided for use on public roads is sometimes taken for private use
- grit bin locations are sometimes a source of complaint on the grounds of environmental damage (salt damage to hedges, gardens etc) and aesthetics ("eye sores")
- although the bins are provided for general community use in practice this very often relies on one or two individuals, and some grit bins are hardly used at all.

Notwithstanding the above the Head of Technical and Property Services is of the view that the proper use of grit bins is to be encouraged and it is proposed therefore to continue to provide grit bins in accordance with the following criteria:-

- (1) Grit bins will not be provided on priority routes (since these are adequately covered under the winter service policy and proposed level of service).
- (2) Grit bins can be provided on "adopted" Cat 2 & 3 non-priority routes:-

- where there are tight bends, steep inclines, junctions, turning areas, "residential homes" or other sections particularly prone to icing-up
 - where the local residents agree on a suitable location within the public road boundaries
 - where there is some confidence that the grit bins will be properly used
- (3) Grit bins can be provided at other locations on public roads where there is a special need and where agreement has been reached with the local residents regarding a suitable location within the road boundary (e.g. at sheltered housing, school crossing patrol points, steps on public footpaths, etc).
- (4) Grit bins are not provided on unadopted roads (grit bins are provided where required on prospective public roads by the developer under Road Construction Consent requirements).
- (5) Grit bins will be stocked and re-filled with a salt/grit mixture, normally 1salt/6 grit.
- (6) The policy of leaving grit bins in place all year round (Report No. 909/00 to the Roads Committee of 24 August 2000 refers) has proved to be cost effective, however in some residential and tourist areas increasing concerns have been expressed over the unsightly nature of such bins through vandalism (although perhaps still serviceable), and litter, etc particularly in the summer months. Given this discretion to remove certain bins through the summer months remain with the Head of Technical and Property Services to consider each case on its merits.
- (7) Grit bins are provided for community use. Where the community is unable to look after the bins or where they have suffered from the effects of repeated vandalism (two separate occasions), the bins will be removed.

When a new bin is provided, a letter is issued to the person(s) requesting the bin stating that the bin is provided for community use but will be removed if subject to repeated vandalism.

Similarly for existing bins, following vandalism, a standard letter is issued to adjacent residents stating that repeated vandalism (two occasions) will result in the grit bin being removed.

8.2 Roadside Grit Heaps

Grit heaps on rural road verges have fallen into disuse as roads have received more regular treatment (especially high land auxiliary routes) and the practice of leaving grit heaps has therefore all but ceased

Roadside grit heaps can be provided where requested and determined appropriate by the Head of Technical and Property Services on rural non-priority routes.

8.3 Farmers' Snowploughs

Since 1996 Angus Council has operated a self-help scheme whereby snow ploughs are issued to farmers for use by them on agreed lengths of public road at minimal cost to the council (initial purchase and annual maintenance costs). The council insures the farmer's tractor while clearing snow on public roads and it is accepted that the farmer will also use the plough for clearing his own access and private roads. This system has worked over the past winters and this will continue and if possible extend if more farmers are prepared to volunteer their services and if additional ploughs can be purchased within the available budget.

9. Snow Conditions

The application of salt to icy roads or precautionary salting when icy conditions are predicted is generally effective and can remain effective over a period of time depending on prevailing weather conditions. Snow conditions on the other hand can require continuous treatment while snowfalls persist and if snow is allowed to become hard-packed effective treatment requires more intensive use of resources (with associated increased costs). It should also be borne in mind that icy roads are always passable (albeit with extreme care on the part of the road user); heavy snow on the other hand, particularly when combined with high winds and drifting, can block roads to all traffic with consequent implications for public health and safety and with detrimental effects on the local economy albeit of a transient nature.

There are real benefits therefore in dealing with snow as quickly as possible by making maximum use of available resources while conditions persist.

Lists of external contractors hired through Tayside Contracts and areas to place snow are available.

In abnormally severe conditions, situations may arise involving life and limb emergencies or serious damage to property that require Angus Council/Tayside Contracts assistance in getting to a casualty/patient or property. Requests for emergency action will normally only be accepted from the emergency services. Supply of feedstuffs to animals will not normally be considered an emergency.

Once the main transport routes are in an acceptable condition, noting that with further low temperatures or additional snow they may require re-treatment, then in heavy snow conditions (as experienced in the winter of 2010/11) resources will be used to address the other issues, in the following general order. The hierarchy below will be followed in principle and will be delivered in a practical and economic way subject to the prevailing

circumstances. The process will be in accordance with the council's incident management procedures and will seek to maximise the productivity of the resources whilst focussing on the hierarchy and it is proposed that such operational management is delegated to officers. The committee are asked to confirm this operational approach.

- Snow clearance of town centre areas;
- Treatment of areas of public transport difficulties (i.e. at or around bus stations, widening of specific routes to enable safe passage of buses);
- Routes to schools– see below;
- Areas requiring clearance for specific road safety issues (such as narrowing routes due to continued ploughing), particularly for school transport routes;
- Town centre car parks, once other services are being restored to enable off street parking;
- Health care areas such as doctors' surgeries, improved access to hospitals;
- Nursing homes and elderly resident areas (through customer contact and specific requests);
- Residents/business requests – whilst these are the majority of our ACCESSLine calls, we will have to limit our response to (potentially) serious issues. Life and limb situations will be assessed and addressed as appropriate.

This process was the basis of the hierarchy followed in snow events and consequently snow clearance is initially focussed on town centres and then radiated out of town centres to areas of public transport, schools and health centres.

As part of the actions to clear non-priority routes, and in order to maximise the effect as quickly as possible, footways on one side of the road only are cleared. This doubles the length of footways which can be cleared with the available resources, allowing increased access to services for the public.

As a consequence of the 2010 event, certain pedestrian areas for snow clearance around schools have been agreed with the Children and Learning Directorate and school head teachers. These areas are those considered to be a priority by the head teacher where they are part of the adopted road. Depending on the school they may include walking routes, bus drop off points and areas used by parents to drop off children. They do not, however, imply the clearance of all routes to the school or in some cases continuous routes. The priorities for the Children and Learning Directorate are that services are restored to secondary schools ahead of primary schools such that the disruption to pupils preparing course work or undertaking preliminary examinations is minimised.

The Children and Learning Directorate have in place processes for making decisions regarding school closures and notifying the media and parents. These are not detailed in this report. The Children and Learning Directorate arranges for the snow clearance of schools grounds as deemed appropriate.

Subsequent to the agreed areas at schools being cleared; restoration of school transport services is the Children and Learning Directorate's next priority. While some of these routes are auxiliary routes, additional clearance

works may be required to provide safe passage of school transport including widening at corners and clearance of passing places on narrow roads often made narrower by accumulations of snow including from ploughing operations. Again priority is given to transport routes for secondary school pupils.

As in previous years, staff and plant resources from Parks Service staff may be available to assist in snow clearance. Where operatives are unable to carry out their normal activities due to the weather they may be available to assist in snow clearance activities. Parks already undertake third party contracts for winter treatment and these remain their priority due to established contractual commitments. These contracts include access and car parks for the health service and servicing of grit bins for housing associations. When available these resources are utilised in snow clearance operations for the council on a wider basis than duties under the Roads (Scotland) Act. This includes clearance of council staff office car parks and council business/industrial estates. This increases the council's winter resilience and assists in restoring council services affected by the weather related issues. These resources are managed through the council's incident management team during extreme weather conditions as appropriate. Operational issues are coordinated but there are resource implications, particularly the ability for operatives to be transported which limits their actual availability for use.

Assistance has been provided in the past by Community Service Criminal Justice Services operatives and in future events any resources made available will be utilised on a self-managed basis.

10. Snow Fencing

Snow fencing does not prevent the deposition of snow on a road completely but can reduce the depth to a level which can be ploughed. Drifting snow which can be a problem long after fresh snow has ceased falling can be controlled by the use of fencing erected on the windward side of likely affected areas. Its use has proved beneficial in the past and it is proposed to continue with permanent snow fencing in high areas. Such fencing can be provided at minimal cost, and all costs can be contained within the winter service budget. The erection of temporary fencing is now no longer carried out on agricultural land given farmers' concerns over damage to crops and drainage and the fact that most locations for temporary fencing were on lower land where more effective treatment practices have led to a reduced need for such installations.

11. Weather Forecasts

An essential requirement for ensuring a state of preparedness and a quick response in marginal conditions is the availability of accurate local weather forecasts. Forecasts of freezing temperatures after rain allow precautionary salting to be carried out before ice forms dependent on operational working hours. Forecasts of early evening or early morning frost or ice allow instructions to be given for operatives on standby to report to depots at a pre-set time to

allow a quick response as temperatures drop. Snow forecasts allow vehicles to be prepared in advance (fitting of snow ploughs, demountable gritters etc).

As stated in Section 6 the Winter Weather Forecast Service Provider also makes use of data from the Ice Prediction System as input to its computerised weather forecasting models. Forecasters also have access to weather radar, satellite, and data from a network of weather stations and observation points.

Weather forecasting is currently being tendered along with Fife, Perth and Kinross, Dundee City, Aberdeenshire, Aberdeen City, Moray and Highland through the Tayside Procurement Consortium.

12. Route Optimisation

A route optimisation exercise was carried out by Vaisala TMI Ltd as an element of the provision of the Ice Prediction System prior to and during the winter of 1998/99.

The priority (Category 1) gritting routes were again studied for running lengths, gritting lengths, distance from the depots and some rearrangements were carried out to produce improved efficiency. Software called "Routesmart" has been used to review the gritting routes as part of a service review and this led to a reduction in priority routes from 11 to 10 for 2013/14. Appendix 3 contains the priority routes covered.

13. Auxiliary Routes (Category 2)

These roads are generally at a higher altitude than the rest of the network and are therefore more prone to icing. They are lightly trafficked compared to the normal criteria used to justify priority treatment. These routes are generally treated in advance of the school bus Monday to Friday.

The Infrastructure Services Committee, on 28 August 2007 in the report on Winter Service Policy and Provision for 2007/08, agreed to treat all high road glen auxiliary routes north of the A928/B957/A90 on Saturday and Sunday mornings and public holiday mornings for access and tourism reasons only when priority routes were being treated. In 2008/09 the C52 Westhills to Cockhill from the B9128 at Draffin to Redford on the B961 was added to ensure consistency. In 2010/11 Auchterhouse Brae was added on a similar basis.

14. Tayside Contracts Working Hours

Tayside Contracts operate seasonal working hours arrangements which included a period of reduced working hours during the winter period.

For seven weeks each side of the winter solstice (i.e. 14 weeks in total) the working hours are reduced to 32½ hours per week (from 39 giving an annual average of 37 hours per week).

Drivers Hours Regulations have been considered in determining the operational aspects of the winter service provision.

15. Pre wetted salt

Pre-wetting of salt with brine can improve salt spreading efficiency by reducing the amount of salt required, helping to target the salt to the road surface making it move to solution quicker and therefore become effective quicker than dry salt. Salinity tanks have been installed at Arbroath and Forfar depots and with priority gritters already fitted with brine tanks. During the winter of 15/16 pre wetting on priority routes was introduced.

16. Hours of Cover

The Roads (Scotland) Act 1984 Section 34 requires the authority to take such steps as they consider **reasonable** to prevent snow and ice endangering safe passage of pedestrians and vehicles. In considering the hours of cover, the council are required to deliver the winter service that is therefore reasonable which has to be practicable operationally and within other legislative requirements such as those laid down in Drivers' Hours legislation.

The hours of cover detailed below indicate the times out with which no services are provided. The times within the hours of cover are the overall period in which services may be delivered but are not the definitive start and finish times for the individual route treatments or the times that routes will necessarily be getting treated.

In practical terms where the hours of cover commence, i.e. at 5.00/6.00 a.m., these times are the earliest time that vehicles would leave the depot and treatment of all of the priority network, which may be some distance away from the depot, will be significantly later as determined by the vehicle journey time.

Similarly the hours of cover are not continuous, in that vehicles can not grit constantly between the hours of cover. Vehicles need to refill with salt and fuel, drivers require breaks and legislatively drivers are restricted to the number of hours that can be driven. Therefore whilst there are double crews for priority carriageways on weekdays neither the priority carriageway or priority footway network can reasonably be treated constantly within the hours of cover and the operational hours are more limited. Further, conditions are likely to change throughout the period of cover thereby obviating the need for continuing treatment as milder conditions prevail.

The hours of cover are also subject to available resources and in the case of vehicle breakdowns or significant driver shortages (such as sickness, particularly pandemic flu, or industrial action).

Therefore due to operational constraints, including resources, it can not be guaranteed that cover commences at the times given or is continuous through out the period of cover.

The actual periods of treatment are based on the weather forecast and actual weather experienced.

Salting/gritting operations are not continuous over the hours of cover stated in the winter maintenance leaflet, etc as vehicles need to refill with salt and fuel and conditions are likely to change throughout the period of cover obviating the need for continuing treatment as milder conditions prevail. Within these details it notes that the start and end times are not definitive and are not continuous. The council's policy also states to use resources available for winter maintenance in the most efficient, effective and economic way to prevent, as far as considered reasonably possible by Angus Council, snow and ice endangering the safe passage of pedestrians and vehicles over public roads. Giving an example of where continuous treatment on priority footways would not be appropriate for instance would be say on a Saturday in January (Policy coverage Priority footways 0600 to 1800) where the forecast is for sub zero temperatures and scattered snow showers. The controller would request a mini gritter (for the one weekend priority route in question). The operative would undertake gritting from 0600 and would expect to complete the route by 0930 approx. For all treatments the operatives checks the performance of their equipment and ensures the correct amount of salt/grit is spread. The forecast snow showers later in the afternoon would have been pre-treated as far as considered to be practically effective. Thus the single weekend priority route would have been treated as appropriate for the weather forecast and further treatment would have had no additional benefit. Therefore the policy "to use resources available for winter maintenance in the most efficient, effective and economic way to prevent, as far as considered reasonably possible, snow and ice endangering the safe passage of pedestrians..." in this illustrative example the policy would have been met. To continue to treat continuously would not be necessary or beneficial.

Tayside Contracts drivers are covered by the Domestic Drivers Hours Regs. In normal circumstances drivers can work 11 hours and drive for 10 hours in any 24 hour period. These rules apply to any full-time drivers (i.e. a driver who has driven for more than 4 hours in any working day of that week). Only in the event of an emergency can a driver exceed those limits. In an emergency **Tayside Contracts apply the ruling that** a driver can be on duty for up to 16 hours but must be given 8 consecutive hours rest before resuming work. Emergencies are defined as an unforeseen event and therefore must not be allowed to **exceed** a reasonable length of time (normally 24 hours **but this is not defined in law**) as it should be possible to make **adequate and on-going arrangements** beyond that. Therefore, outside an emergency situation, if the decision is made to work to 11pm in line with Angus Council **policy** extreme care needs to be exercised to ensure compliance with the Drivers Hours Regs. and in the lead in it may be necessary to send **drivers** home to have sufficient rest beforehand. This may leave other parts of the network without resource, i.e. not enough men to operate minis, etc. If the weather forecast isn't sufficiently accurate and such a decision has to be made late in the working day operatives may have been working on other things and are unable therefore to work on till 11pm (or possibly before). By this time they may have already worked a full day and then can only perform one grit run at 3 hours.

16.1 Carriageway Priority Routes - Hours of Cover

To be fully effective salt spread on road surfaces requires the action of traffic to aid dispersal and to assist the break-up of ice and snow. There is therefore little benefit and high cost in treating roads at times when traffic is very light. Also, by definition, the risk of accidents reduces as traffic volumes decrease.

The weekday hours of cover for treatment of priority carriageway routes for are 05.00 - 23.00 hours as detailed in Appendix 1 in that gritting does not commence unless operations can be completed by 23.00. This reflects the reality of the current level of service whereby gritting does not commence unless operations can be completed by 23.00 hours. Effectively, with a typical 2.5 to 3 hour route treatment time gritters are therefore not sent out after 20.00 hours. In practice precautionary salting treatment is normally undertaken earlier in the evening. The need to grit later in the evening is only required when rain is forecast to precede freezing temperatures. Early treatment might then result in the salt being washed off the road leaving no protection later in the evening. Whilst precautionary salting treatments are normally carried out in the early evening, when the forecast indicates rain followed by freezing temperatures gritters will commence treatment up to 20.00 hours (finishing up to 23.00 hours). Rain until after 20.00 hours followed by freezing temperatures before 05.00 means that priority roads would remain untreated and possibly icy with treatment not starting until 0500.

In 2011/12 one of the priority gritting routes was altered to include a section of the C60 and C59 known locally as Balcathie from the A92 south of Arbroath to Arbirlot aiding access for the school bus and also a section of the C1 from the A92 from Upper Victoria to Craighton known as The Marches for operational and safety reasons was added.

16.2 Carriageway Priority Routes - Weekend Cover and Public Holidays

Weekend and public holiday traffic levels on priority routes are approaching those during weekdays and therefore weekday hours of cover are continued for Saturdays and Sundays, i.e., 05.00 hours till 23.00 hours (latest time for mobilisation 20.00 hours (see Section above)).

16.3 Footways Routes - Hours of Cover

On priority footways the hours of cover are between 06.00 and 18.00 hours on weekdays and Saturdays, and 08.00 till 18.00 hours on Sundays for priority routes. On Saturdays and Sundays only busy shopping areas are treated where the majority of weekend pedestrian traffic activity takes place. (On weekdays school routes and the like are included in the priority footway routes). On non-priority footways the hours of cover are between 07.30 and 16.00 hours Monday to Friday.

Footway treatment is usually carried out either early mornings or during the day. The policy also takes account of public feedback and benchmarking in line with the Best Value Service Review for Road Maintenance.

It should be noted that the width of treatment on footways will be dependent on the width of spreader used.

There is no footway treatment on Public Holidays

16.4 Auxiliary Routes - Hours of Cover

The publicised hours of cover for treatment of auxiliary carriageway routes for weekdays are as detailed in Appendix 1 Monday to Friday. The timing of treatment for these routes is in-line with the bus operators' times for school transport services. High level auxiliary routes treated Saturday and Sunday and public holidays' **mornings only** will be treated at the same time as priority routes for reasons of supervision efficiency.

17. In broad terms Angus Council's policy and procedures generally accord with the current recommendations in the Code.

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

This is the function of the annual policy and operational plan

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

Since the start of Angus Council, the salt anticipated for use has been purchased ahead of the season.

The Code suggests a resilience benchmark of 12 days/48 runs for full pre season salt holding by 1 November for English authorities and 6 days resilience for salt and other resources, (fuel, etc) is recommended.

The salt quantities have been reviewed in light of the past five winters the overall holding is 19,000 tonnes with a minimum holding of 5,500 Tonnes for any period of extreme weather compared to an average season. The quantity of 5,500 tonnes represents the amount of salt used for a 18 day severe spell of weather without conservation measures (as experienced in December 2009/January 2010).

Angus Council consults with Tayside Police as part of its annual review of winter maintenance policy presented to Committee each year.

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

The council has collaborative arrangements in place through Tayside Contracts which leads to an effective and value for money approach to increasing winter service resilience including procurement of salt and plant for the region.

Tayside Procurement Consortium is now procuring the weather forecast, Bureau and ice station maintenance service for the Fife, and the former Tayside and Grampian region council areas. There are also cross boundary gritting arrangements.

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

Angus Council has previously consulted with the Police, NHS Tayside, bus service providers, Education and Passenger Transport colleagues to determine critical areas and infrastructure. Regular contact before and during winter is maintained with neighbouring roads authorities.

5. Authorities should consider sharing depots.

This is not appropriate geographically for Angus.

6. Authorities should ensure effective communication of information for the public before and during both normal and severe winter weather conditions and establish ties with the media.

Angus Council has published a winter maintenance leaflet for many years which is revised annually. It provides the main information available on the council's website.

The council continues to issue press releases, occasionally in conjunction with the police during the winter and responds to press inquiries. In addition the council has developed the use of social networking. Advice on self help is given and encouraged.

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

See response to Recommendation 5 above.

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

This is a function of the annual policy and operational plan.

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

Angus Council's routing strategy generally accords with the road hierarchy as treatment routes already take account of traffic levels. This Report contains the agreed priority routes. Non priority routes are those routes that are adopted by Angus Council as local roads authority that are not priority or auxiliary routes. The route hierarchy generally takes on board the factors highlighted in the Code such as transport strategies, climatic conditions, other authorities, consistency, topological factors, footways, cycleways and accessibility dependencies for remote communities. The latter issue may be argued in the case of the high level glen routes at weekends.

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

The council adopted the salt conservation measures in previous seasons when salt was limited and has a long established priority route network.

This approach was replicated in adjacent authorities and on a national basis through SCOTS.

Monitoring of resilience and contingency is carried out through the Scottish salt cell of Transport Scotland.

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

The council procures salt through Tayside Contracts and there is consequently some sharing of deliveries if required as well as limited sharing of salt stocks.

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

Angus Council have tried and tested decision making processes.

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

The authority has in place supervisory and management systems in order to ensure performance is monitored and adapted to the prevailing conditions.

- 14.** Authorities should make use of GPS where possible.

Tayside Contracts have this fitted to priority gritters and are striving to get operational.

- 15.** Authorities should prepare Health and Safety policies, etc and discuss with contractors to ensure implemented.

Angus requires Tayside Contracts to comply.

- 16.** Authorities should consider qualifications and experience, record and ensure competence and need for refresher training

Angus Council staff are given training particularly in gritting decision making based on the information from forecasters and detection equipment. Tayside Contracts' operational staff undergo competence based training. This training is not City and Guilds but is deemed to be of sufficient quality for the tasks required. Route based training is also given and covers farmers, etc used on certain routes and operations. Tayside Contracts have in place Safe Working Arrangements.

- 17.** Authorities and relevant organisations should provide training and conduct periodic exercising to test plans for responding to severe weather events.

Given the frequency of weather events in Scotland this recommendation is not considered as necessary.

- 18.** Authorities should consider their approach to salt supply – service rather than commodity purchase; summer restocking; develop close relationships.

This is considered through the arrangements with Tayside Contracts that the council has benefited from purchasing through a broker rather than direct with suppliers. The service currently received is considered appropriate. By utilising Tayside Contracts they have access to more than one supplier.

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

This is considered through the arrangements with Scotland Excel. However there are concerns that such arrangements can have little benefit in times of crisis and that the intervention of the Scottish Government can effect such arrangements.

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

As part of the Committee process the service is reviewed annually before being recommended for approval by Committee.

Angus Council listens to the comments made by its customers and incorporates changes as determined necessary. Annual "wash up" meetings are held with Tayside Contracts to review the winter past and preparation for the next.

Angus Council consults with Tayside Police as part of its annual review of winter maintenance policy presented to Committee each year and shares information with its neighbours Perth & Kinross and Aberdeenshire Councils as well as publishing information on the web and through a leaflet. There is also collaboration of services with neighbouring authorities for salt/forecast procurement along with cross boundary routes and the use of Neighbourhood Services resources.

18. Decision Making Treatment Matrix

The SCOTS Winter Service Subgroup had been in consultation with the National Winter Service Research Group (NWSRG) concerning the implementation of Appendix H of the previous Well Maintained Highways Code of Practice This document contains a number of suggestions developed by the SCOTS Winter Service Subgroup to implement Appendix H that have been commented on by the NWSRG. These comments indicate where the NWSRG agree with the SCOTS Winter Service Subgroup interpretation of Appendix H, where they do not agree and where they indicate that they will review the text of Appendix H in relation to these matters. The primary residual issues that the SCOTS Winter Service Subgroup have identified with Appendix H are indicated below along with advice for variations to be applied.

Having considered the feedback from the NWSRG on the review of Appendix H the SCOTS Winter Service Subgroup provides advice that Scottish Local Roads Authorities adopt the variations to Appendix H of Well Maintained Highways listed below. The SCOTS Winter Service Subgroup provides the following justification for advising these variations and seeks Scottish Local Authority views for the winter 15/16. There has yet

to be feedback from the group on numbers of authorities taking up the advice. Angus Council approved these as policy in its August Committee Report 295/15.

- Review conclusions based on significant experience of delivering winter service in by Scottish local Authorities.
- Review conclusions based on developed best practice within Scottish local Authorities.
- Recognition that going forward that these variations to Appendix H, and the successor document, need to be monitored in relation to the development of equipment, research undertaken and revisions to Appendix H.
- These variations to Appendix H of Well Maintained Highways need to be kept under review by the SCOTS Roads Group/SCOTS Winter Service Subgroup to continue to inform the most appropriate approach to Winter Service to be taken by Scottish Roads Authorities.

Advised Variation to Appendix H	Applying Variation? – Yes or No / Reasons
<p>Section 4 De-Icing Materials and Section 7 Calibration of Salt Spreaders – In relation to the calibration of spreaders – “Spreaders should be calibrated twice per season ie in advance of the winter season and at mid-season. Additional calibration may be required dependant on concerns raised or changes to relevant parameters through the regular monitoring of treatments carried out.”</p>	<p>Angus Council will comply with SCOTS advice opposite as agreed with PKC and DCC.</p> <p>Priority – purpose built and demount gritters – to be set for coarsest salt – i.e. rock/marine Angus will set for rock.</p> <p>Will not calibrate footway gritters.</p>
<p>Section 4 De-Icing Materials – In relation to salt/abrasive mixes – “It would be up to each Roads Authority, during periods of salt conservation, to determine the appropriate ratio of salt/abrasive mix dependant on prevailing weather conditions and salt reserves.”</p>	<p>Will comply with SCOTS advice opposite. Normally 1:1; salt to sand mix.</p>
<p>Section 6 Salt Storage – in relation to spread rates for salt stored outside and unprotected – “Salt stored outside and unprotected should not be spread at rates lower than 10-15g/m2.”</p>	<p>Angus Council agree and will follow SCOTS advice opposite.</p>
<p>Section 6 Salt Storage – In relation to salt stockpile rotation – “Where salt is to be used that has been stored outside and unprotected for more than one winter season or stored outside and under cover for more than 3 winter seasons then a risk based approach, including</p>	<p>As above</p>

<p>testing, calibration and monitoring, should be undertaken in determining the adequacy of the salt for use in carriageway treatments and the subsequent spread rates."</p>	
<p>Section 6 Salt Storage – In relation to salt testing frequency – "Salt testing should be carried out twice per season ie in advance of the winter season and at mid-season. Additional testing may be required dependant on concerns raised through the regular monitoring of treatments carried out."</p>	<p>As above in relation to moisture content as with PKC and DCC.</p>
<p>Section 6 Salt Storage – In relation to the use of salt with a high moisture content - "Where salt is to be used that has a moisture content in excess of 4.5% then a risk based approach, including testing, calibration and monitoring, should be undertaken in determining the adequacy of the salt for use in carriageway treatments and the subsequent spread rates."</p>	<p>Agreed – likely to be "poor" salt distribution anyway.</p>
<p>Section 10 Treatment Spread Rates – In relation to treatment spread rates – "For dry salt the treatment rates derived from the development work undertaken by the Edinburgh, Lothian, Borders and Fife Councils Roads Working Group and indicated in the SCOTS treatment table should be utilised by the Scottish Local Roads Authorities".</p>	<p>Agreed for when using dry salt. Angus Council to use pre wet version for priority col C.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to depths of snow – "Light snow should be defined as <10mm and moderate/heavy snow should be defined as ≥ 10mm".</p>	<p>No issue but in relation to these conditions Angus Council likely to treat 20g/sqm and reassess/consider need for further action.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to ploughing at level crossings - "A standard agreement with Network Rail on ploughing procedures at level crossings should be developed."</p>	<p>Agreed – happy to agree through SCOTS. Angus Council do not plough across lines.</p>

<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to precautionary treatments before snow or freezing rain (replacing treatment matrix D - “For precautionary treatments before snow or freezing rain the treatment rates indicated in the SCOTS treatment table should be utilised by the Scottish Local Roads Authorities”.</p>	<p>Agreed See sec 11 above.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to treatments during snowfall (replacing Appendix H Treatment Matrices E and F) - “During snowfall treatments following ploughing should be undertaken to provide a de-bonding layer at 20g/m² of dry salt, 20g/m² of treated salt or 15g/m² of pre-wetted salt”.</p>	<p>Agreed See sec 11 above.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to treatments for thin layers of ice and layers of compacted snow and ice (replacing Appendix H Treatment Matrix G) - “For treatments of thin layers of ice, layers of compacted snow and ice omit Appendix H Treatment Matrix G and use Appendix H Treatment Matrix H”.</p>	<p>Agreed See sec 11 above.</p>

Page 395 H13 of Code Spreading when no or very little traffic – increase spread rate by 25% - Not agreed by Angus Council

Decision Making Treatment Matrix Notes

- (a) Particular attention should be given to possibility of water running across carriageways and other surfaces e.g., off adjacent fields after heavy rains, washing off previously deposited salt. Such locations should be closely monitored and may require further treatments.
- (b) When a weather warning contains reference to expected hoar frost, considerable deposits of frost are likely to occur. Hoar frost usually occurs in the early morning and is difficult to cater for because of the probability that any salt deposited on a dry road too soon before its onset, may be dispersed before it can become effective. Close monitoring is required under this forecast condition which should ideally be treated just as the frost is forming. Such action is usually not practicable and salt may have to

be deposited on a dry road prior to and as close as possible to the expected time of the condition subject to the Council's hours of cover (5:00am to 11:00pm). Hoar frost may be forecast at other times in which case the timing of the salting operations should be adjusted accordingly.

- (c) When rain is forecast prior to frost, treatment should be timed to commence at the cessation of rainfall subject to being completed within the council's hours of cover (5:00am to 11:00pm).
- (d) If rain is forecast to fall on frozen surfaces then treatment should take place on the dry roads prior to the commencement of the rain and again during the rainfall until temperatures are above 0°C, subject to being completed within the council's hours of cover (05:00 a.m. to 11:00p.m.).
- (e) Proposed action plans should take into account the hours of cover provided by Angus Council. If possible treatment should be brought forward to ensure treatment before hours of cover are exceeded.

Target Spread Rates of Salt - Included in table. For salt stored under cover a pre treatment can be 10g/sqm; for salt stored outside, a pre treatment should be 15g/sqm.

De-icing Materials

Materials used are detailed.

Negative texture thin surfaces are monitored to ensure effectiveness of treatment.

Where hard packed snow and ice have formed and cannot be removed by ploughing, a salt sand mix can be used in successive treatments at a spread rate of 20 – 40 g/sqm. This aids vehicle traction and acts to break up the snow and ice.

Sand used in mixes shall be single sized abrasive such as 5mm sand having a low fines content. The particles should be angular in shape and suitable to create an abrasive surface. The sand can be added to salt at a rate of 1:1 by weight.

Decision Making Treatment Matrix

WINTER TREATMENT SPREAD RATE MATRIX SCOTS WINTER SERVICE SUBGROUP ADVICE - JULY 2015

Salt Type	Precautionary Treatment for frost / ice	Variation of Well Maintained Highways Appendix H - September 2013					
		Column C	Column D	Column G	Column H	Column K	Column L
		Poor Cover medium Traffic Normal Loss	Poor Cover medium Traffic High Loss	Fair Cover medium Traffic Normal Loss	Fair Cover medium Traffic High Loss	Good Cover medium Traffic Normal Loss	Good Cover medium Traffic High Loss
Dry Salt	<p>Table H9 of Code - where the road surface is dry no action is needed even when conditions are below zero</p> <p>RST at or above -2 Degrees and damp road conditions</p>	10(8) [15 ▶10]	10(8)	10(8)	10(8)	10(8)	10(8)
Pre-wet Salt		10(8)	10(8)	10(8)	10(8)	10(8)	10(8)
Treated Salt		10(7)	10(7)	10(7)	10(7)	10(7)	10(7)
Dry Salt	RST at or above -2 Degrees and wet road conditions	15(13) [15]	20(16)	10 or 15(11)	15(13)	10(8)	10
Pre-wet Salt		15(12)	15(14)	10(10)	15(12)	10(8)	10(9)
Treated Salt		10(10)	10 or 15(11)	10(8)	10(10)	10(7)	10(7)
Dry Salt	RST below -2 deg C and above -5 deg C and damp road conditions	15 or 20(17) [15]	20	10 or 15(14)	20(17)	10 or 15(11)	15(13)
Pre-wet Salt		15 or 20(16)	20(18)	15(14)	15(16)	15(11)	15(12)
Treated Salt		15(12)	15(14)	10 or 15 (11)	15(12)	10(8)	10(10)
Dry Salt	RST below -2 deg C and above -5 deg C and wet road	1 x 20 then monitor & treat as required(2x17)[20]	1 x 20 then monitor & treat as requ'ed(2x20)	1 x 20 then monitor & treat as requ'ed(2x28)	1 x 20 then monitor&treat asrequ'ed(2x17)	20(20)	1 x 20 then monitor & treat as required(25)

Pre-wet Salt	conditions	1 x 20 then monitor & treat as required(2x16)	1 x 20 then monitor & treat as requ'ed(2x18)	1 x 20 then monitor & treat as requ'ed (27)	1 x 20 then monitor & treat as requ'ed(31)	1 x 20 then monitor & treat as requ'ed(21)	1 x 20 then monitor & treat as required(24)
Treated Salt		1 x 20 then monitor & treat as required(24)	1 x 20 then monitor & treat as requ'ed(28)	1 x 20 then monitor & treat as requ'ed (21)	1 x 20 then monitor & treat as requ'ed(24)	1 x 20 then monitor & treat as requ'ed(16)	1 x 20 then monitor & treat as required(19)
Dry Salt	RST at or below -5 deg C and above -10 deg C and damp road conditions	1 x 20 then monitor & treat as required(2x16)[20]	1 x 20 then monitor & treat as requ'ed(2x19)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor&treat asrequ'ed(2x16)	20	1 x 20 then monitor & treat as required(24)
Pre-wet Salt		1 x 20 then monitor & treat as required(2x16)	1 x 20 then monitor & treat as requ'ed(2x18)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor & treat as requ'ed(31)	1 x 20 then monitor & treat as requ'ed(21)	1 x 20 then monitor & treat as required(24)
Treated Salt		1 x 20 then monitor & treat as required(23)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor & treat as requ'ed (20)	1 x 20 then monitor & treat as requ'ed(23)	1 x 20 then monitor & treat as requ'ed(15)	1 x 20 then monitor & treat as required(18)
Dry Salt	RST below -5 deg C and above -10 deg C and wet road conditions	1 x 20 then monitor & treat as required(2x32)[20]	1 x 20 then monitor & treat as requ'ed(2x39)	1 x 20 then monitor & treat as requ'ed(2x27)	1 x 20 then monitor&treat asrequ'ed(2x32)	1 x 20 then monitor&treat asrequ'ed (2x20)	1 x 20 then monitor & treat as required(2x24)
Pre-wet Salt		1 x 20* then monitor & treat as required(2x31)	1 x 20 then monitor & treat as requ'ed(2x36)	1 x 20 then monitor & treat as requ'ed2x(27)	1 x 20 then monitor & treat as requ'ed(2x31)	1 x 20 then monitor & treat as requ'ed(2x21)	1 x 20 then monitor & treat as requ'ed(2x24)
Treated Salt		1 x 20 then monitor & treat as requ'ed(2x23)	1 x 20 then monitor & treat as requ'ed(2x27)	1 x 20 then monitor & treat as requ'ed(2x20)	1 x 20 then monitor & treat as requ'ed(2x23)	1 x 20 then monitor & treat as requ'ed(30)	1 x 20 then monitor & treat as required(2x18)

() = App H

[] = 14/15 Angus Figure

H4.34 of Code. The dry salt: brine mix proportions can be varied but are typically 0:30 by weight. Therefore 10g of pre wetted salt containing 7g of dry salt plus 0.66g of (pre) salt in brine if the brine concentration is 22%

Please note that NWSRG were not able to answer whether 2x16, etc was to be placed before freezing conditions or during to cover the period of the forecast.

Please see H10.25 regarding effectiveness of sodium chloride at low temperatures.

If confident in residual figures can reduce figures above.

* consider pure salt no pre wet

WINTER TREATMENT SPREAD RATE MATRIX SCOTS WINTER SERVICE SUBGROUP ADVICE
- JULY 2015

Salt Type	Precautionary Treatments Before Snow or Freezing rain	Light or Medium Traffic	Heavy Traffic
Dry Salt	Light Snow Forecast	20g/m ²	20g/m ²
Pre-wet Salt		20g/m ²	20g/m ²
Treated Salt		15g/m ²	15g/m ²
Dry Salt	Moderate/Heavy Snow Forecast	20g/m ²	40g/m ²
Pre-wet Salt		20g/m ²	40g/m ²
Treated Salt		15g/m ²	30g/m ²
Dry Salt	Freezing rain Forecast	1 x20g/m ² then monitor	
Pre-wet Salt		1 x20g/m ² then monitor	
Treated Salt		1 x15g/m ² then monitor	

ANGUS COUNCIL APPENDIX H 2016 -17			
WINTER TREATMENT SPREAD RATE MATRIX			
ANGUS COUNCIL REFERENCE	SALT TYPE	PRECAUTION TREATMENT FOR FROST / ICE	SPREAD RATE IN GRAMS
A1, A2, A3, B1, C1, D1	Pre-Wet Salt	Road Surface dry. No Action needed even when conditions are below zero	0
A1, A2, A3, B1, C1, D1	Dry Salt		
B2	Pre-Wet Salt	RST at or above -2 Degrees and damp road conditions	10 (7 salt 3 brine)
B2	Dry Salt		10
B3	Pre-Wet Salt	RST at or above -2 Degrees and wet road conditions	15 (10 salt 5 brine)
B3	Dry Salt		15
C2	Pre-Wet Salt	RST below -2 Degrees and above -5 Degrees and damp road conditions	15 (10 salt 5 brine)
C2	Dry Salt		15

C3	Pre-Wet Salt	RST below -2 Degrees and above -5 Degrees and wet road conditions	20 (13.5 salt 6.5 brine) then monitor and treat as required
C3	Dry Salt		20 then monitor and treat as required
D2	Pre-Wet Salt	RST below -5 Degrees and above -10 Degrees and damp road conditions	20 (13.5 salt 6.5 brine) then monitor and treat as required
D2	Dry Salt		20 then monitor and treat as required
D3	Pre-Wet Salt	RST below -5 Degrees and above -10 Degrees and wet road conditions	20 (13.5 salt 6.5 brine) then monitor and treat as required
D3	Dry Salt		20 then monitor and treat as required

DECISION MAKING TREATMENT MATRIX

Forecast or Actual Condition		Reactive Treatment	
A	Road Surface temperature above 1°C	L	Snow accumulations over 30mm
B	Road Surface temperature 1°C to -2°C	M	Hard Packed Snow/Ice
C	Road Surface temperature -2°C to -5°C		
D	Road Surface temperature below -5°C		
E	Road Surface temperature 0°C to -2°C following rain		
F	Road Surface temperature -2°C to -5°C following rain		
G	Road Surface temperature below -5°C following rain		
H	Hoar Frost		
I	Freezing Fog		
J	Freezing Rain		
K	Snow Accumulations		

Road Surface Condition

1	Road Surface Dry
2	Frost Susceptible area / known surface water run off
3	Road Surface Wet

	Road Surface Condition 1		Road Surface Condition 2		Road Surface Condition 3	
	Dry	Wet / Dry	Dry	Wet / Dry	Dry	Wet / Dry
A	0	0	0	0	0	0
B	0	0	15	15	15	15
C	0	0	15	15	20	20
D	0	0	20	20	20	20
E	15	15	15	15	20	20
F	15	15	15	15	20	20
G	20	20	20	20	20	20
H	15	15	15	15	20	20
I	15	15	15	15	20	20
J	20	20	20	20	30	30
K	20	20	20	20	20	20
L	20	20	20	20	20	20
M	40	N/A	40	N/A	40	N/A

All Spread rates in gm / m²

For Reactive treatments L and M treatment should include ploughing operations.

The intervention Matrix assumes no residual de-icing material on the carriageway. The presence of residual de-icing material will be taken into account and spread rates adjusted in preparing proposed action plans.

All decisions should be taken with reference to Notes (a) to (e)

Priority Footway Gritting Decision Making

1. On issuing the mid day action plan the Angus Council duty controller considers the 5 day forecast noting that Tayside Contracts require 36hours notice for priority footway treatment. If forecast suggests wet surfaces and sub zero temps or snow/ice he puts priority footway crews on standby for 6am treatment (i.e. in approx. 36 hours' time). The controller has the option of not placing minis on standby where he is able to justify this decision e.g. weather conditions, residual salt, etc and reasons must be recorded.

2. On issuing the mid day action plan the day before the planned treatment (i.e., in approx 18 hours time) the duty controller determines whether or not forecast still suggests wet surfaces and sub zero temps or snow/ice, hoar frost, then priority footway crews remain on stand by for 6am treatment. If there is a significant change to forecast whereby wet surfaces and sub zero temps no longer apply then priority footway crews are removed from stand by requirement.

3. On the actual day where priority footway crews report at 6 a.m. the Angus Council supervisors will check around areas and call salt run on priority footways as required. The supervisors have the ability to decide not to treat if the weather or conditions are such that treatment is not needed or there is sufficient residual salt already down although all such decisions must be recorded. It is noted that spread rates for minis are not given. The controller also has the option of not placing minis on standby where he is able to justify this decision e.g. weather conditions, residual salt, etc and again reasons must be recorded.

21. Salt Conservation

Where grit/salt conservation is required it must be agreed with the Head of Property and Technical Services to deviate from the gritting/salting matrix and introduce salt conservation techniques in accordance with advice on salt conservation as current in the Code of Practice or as deemed appropriate.

APPENDIX 1

WINTER SERVICE 2017/2018
LEVEL OF SERVICE AND PERFORMANCE STANDARDS

(a) Period of Cover

Based on past experience the probability of wintry weather is very low before the end_of October/ beginning of November and after the first week in April. Personnel will therefore be required to standby to provide cover out with normal working hours for priority routes

From – 30 October 2017 To – 30 March 2018

It is intended to run a reduced service of four gritters in the three weeks before and after these dates and with limited resources response times will be slower. The four gritters are used to cover the main priority A, B and C class high speed rural roads. Not all A, B and C class roads or high speed ones are covered. Thereafter they are deployed as required. It should be made clear that that they do not treat all the priority routes in the timescales as would be expected in the core winter time. This reduction in performance is however considered reasonable given the reduced and ever-decreasing likelihood of wintry conditions away from these dates.

The proposed coverage during the Christmas/New Year Holiday Period is detailed in Appendix 2(c).

(b) Hours of Cover

To be fully effective salt spread on road surfaces requires the action of traffic to aid dispersal and to assist the break-up of ice and snow. There is therefore little benefit and high cost in treating roads at times when traffic is very light. Also, by definition, the risk of accidents reduces as traffic volumes decrease. The following hours of cover are therefore considered reasonable:-

Day 30 Oct 17 to 30 March 18	Priority Routes Carriageway	Auxiliary Routes Carriageway	Priority Routes Footways	Non-Priority Routes Carriageway and Footways
Monday - Friday	05.00 – 23.00*	06.00 – 16.00	06.00 - 18.00	07.30 - 16.00
Saturday	05.00 – 23.00*	05.00 - 08.00**	06.00 – 18.00	Nil
Sunday	05.00 – 23.00*	05.00 - 08.00**	08.00 – 18.00	Nil
Public Holidays	05.00 – 23.00*	05.00 - 08.00**	Nil	Nil

Public holidays – 25 and 26 Dec 2017 and 1 and 2 Jan 2018

*Latest time for start of treatment with completion by 23.00 is 20.00

**Auxiliary glen routes north of A926/B957/A90 + C52 (B961 to B9128) + U338 Auchterhouse Brae

When snow or icy road surfaces are forecast standby crews will be required to report to their depots at pre-set times within the above hours of cover. If circumstances change or adverse conditions occur unexpectedly standby crews will be called out from home in which case longer response times will delay the commencement of treatment. However, given the increased sophistication of weather forecasting and the ice prediction system the probability of unforeseen adverse conditions is low. Therefore compared to the alternative "fail-safe" option of having men standing-by in their depots at all times out with normal working hours even during clement weather (with associated cost implications) this increase in response time in a call-out situation is considered reasonable.

(c) Christmas and New Year Holiday Period Hours of Cover

During the Christmas and New Year Holiday period Tayside Contracts operate normal working on the working days between Christmas and New Year. Coverage for priority and non-priority routes will therefore be as follows:-

Day	Priority Carriageways + ((aux glen +C52 + U338)Sat/Sun +pub hols am only)	Priority Footways	Non-Priority Carriageways and Footways(incl aux)
Fri 22.12.17	05.00 – 23.00	06.00 – 18.00	07.30 – 16.00
Sat 23.12.17	05.00 – 23.00	06.00 – 18.00	Nil
Sun 24.12.17	05.00 – 23.00	08.00 - 18.00	Nil
Mon 25.12.17	05.00 – 23.00	Nil	Nil
Tues 26.12.17	05.00 – 23.00	Nil	Nil
Wed 27.12.17	05.00 – 23.00	06.00 – 18.00	07.30 – 16.00
Thur 28.12.17	05.00 – 23.00	06.00 – 18.00	07.30 – 16.00
Fri 29.12.17	05.00 – 23.00	06.00 – 18.00	07.30 – 16.00
Sat 30.12.17	05.00 – 23.00	06.00 – 18.00	Nil
Sun 31.12.18	05.00 – 23.00	08.00 -18.00	Nil
Mon 01.01.18	05.00 – 23.00	Nil	Nil
Tues 02.01.18	05.00 – 23.00	Nil	Nil

(d) Standby Requirements

In order to ensure availability of drivers, mechanics and supervisory staff it is necessary to put personnel on "standby" on a rota basis – i.e. to require personnel to remain available and contactable by telephone or pager at all times out with normal working hours. To compensate for this restriction of freedom standby allowances are paid. These costs are fixed costs (whether or not the operatives are called out) and have to be allowed for in the budget. Taking into account the resources available and the need for a guaranteed response on priority routes out with normal working hours the following standby arrangements are considered reasonable.

30Oct 17 – 30 March 2018

	No of men per week	
Gritter Drivers (0800-2300)	10	(Total No = 30 on 1 in 3 rota)
Gritter Drivers (0500-0800)	10	a.m. only
Auxiliary Route Drivers	3	a.m. only (6 for rota)
Footway Snowplough Drivers	20*	(= Total No)
Footway Snowplough Back-up	11*	(= Total No)
Mechanics	2	(Total No = 7 on separate 1 in 4 and 1 in 3 rotas)
Supervisors (i.e. Tayside Contracts' Supervisors)	1	(Total No = 5 on 1 in 5 rota)

* Footway Snowplough Drivers and Back-up Crews are put on standby on a day-to-day basis depending on the weather forecast.

(e) Salt Stocks

These are as described in Section 7. A salt stock holding at the start of the winter maintenance period which should be sufficient for the start is held.

(f) Response Time

The "response time" is the period between decisions being taken to begin treatment and vehicles leaving the depot. This must take into account distance between operatives' homes and depots in a call-out situation, pre-start checks on vehicles, and time required to load up with salt and fuel.

A maximum response time of:-

One Hour is considered reasonable from home to depot.

(g) Treatment Time

The "treatment time" is the period between vehicles leaving the depot and the completion of treatment on all priority routes for salting and gritting. (Treatment times for snow-clearing will vary considerably depending on the depth and persistence of the snow fall). The aim is to complete salting and gritting of priority carriageways before the major peak traffic flows.

Treatment times will depend on route length, distance to start of route from depot, carrying capacity of gritter, speed limits, prevailing weather conditions, driver experience etc. Unrealistically short target treatment times will have disproportionate cost implications. Relaxed (long) target treatment times will mean either completion after traffic has built up or extended working at overtime rates (with associated cost implications).

(h) Assistance From Other Departments

This is described in Section 3 of this report.

Routes treated by farmers acting as sub-contractors to Tayside Contracts are:

Auxiliary Routes

Route B22A – UC445/447 Aberlemno

Route B24 - C34 Glen Lethnot

Route B25 - C36 Glenesk

Routes M48 & M46 - Montrose area

Routes T51A & T51 - Muirhead/Birkhill areas

Route K44 - B955 Glen Clova

Route K45 - C27 & C28 Glen Prosen

Route K43 - Kilry/Lintrathen areas

Route B23A – Ogil/Quiech

Farmers/Contractors for gritting Burghs and Villages - non priority

Route K37 & K38 - Kirriemuir Burgh

Route T52 - Wellbank and Tealing areas

Route F30 - West half of Forfar, Glamis & Padnaranam

Route F31 - East half of Forfar, Lunanhead and Kingsmuir

Route B28 - Brechin

Route A13- Arbroath East

Route A14 - Arbroath West

Route A15 - Arbroath West

Routes K37 & K38 - Kirriemuir extra when snow.

WINTER SERVICE 2017/2018
PLANT AND VEHICLES

Depending on the prevailing conditions an effective Winter Service requires a range of specialised plant, adapted operational vehicles, and normal operational vehicles. The level of service which can be provided is directly related to the plant available and the costs (both fixed and variable) of providing this plant, keeping it in serviceable condition, and operating it when required. Because of the hostile environment (freezing temperatures, slippery road conditions, high exposure to salt, heavy loading and traction etc) in which this plant operates maintenance costs are significantly higher than for normal vehicles. Efficiency and reliability deteriorates rapidly with age and allowance must be made for renewal of worn out plant. Taking into account the resources available and experience of winter weather encountered in previous years, provision of the following vehicles and plant is considered reasonable:-

Snow blower attachment	1 No
Snow cutters/blowers	1 No
Purpose Built 6 x 6 Gritters (9m ³)	4 No
Purpose Built 4 x 4 Gritters (6m ³)	1 No
Purpose Built 6 x 4 Gritters (9m ³)	6 No
Purpose Built 4 x 2 Gritters (6m ³)	2 No
Operational Lorries with Demountable Gritters (6m ³)	6 No
Hired Tractors with Trailing Gritters	23 No
Tractor Shovels	1 No
Loading Shovels	2 No
Tractor Digger / Loaders	4 No
Footway Tractor Snowploughs	20 No

Tayside Contracts manage and maintain the winter maintenance fleet on a Tayside-wide basis. Vehicle replacements are prioritised on the basis of age, condition, cost of repair, serviceability, etc.

For winter 2017/18 new replacement vehicles are expected as follows:

A57 plate to be replaced with a surplus 63 plate DAF 4x2 from Perth

1 footpath SN57 being replaced with a new John Deere + Khun hopper.

6 trailing gritters

1 new plough and 1 plough cover.

WINTER SERVICE
PRIORITY ROUTES

(a) **CARRIAGEWAYS**

Priority gritting routes have to be carefully planned to minimise the “unproductive travel” (distance from depot to start/end of route, sections of route covered twice, one-way traffic systems, sections of route overlapping with other gritting routes, etc). Routes must also be practical for the size and type of plant deployed. Optimum gritting routes have been drawn up to maximise the inclusion of strategic routes. However these will inevitably include lengths of less important roads linking strategic routes and necessarily covered for overall routing efficiency. For obvious reasons the gritting route is treated (unless already covered) over its full length (including these less important roads).

The following roads including both strategic routes and non-strategic roads required for routing efficiency are therefore proposed as PRIORITY CARRIAGEWAYS:-

URBAN ROADS

ARBROATH

Abbey Park	Emislaw Drive	Ladyloan
Abbey Path	East Abbey Street	Lamley Terrace
Abbey Street	East Grimsby	Leonard Street
Abbot Street	East Kirkton Road	Ladybridge Street
Academy Lane	East Muirlands Rd	Lochlands Drive
Addison Place	Fisheracre	Lochlands Street
Alexandra Place	Flairs Avenue	Lordburn
Arbirlot Road	Gallowden Road	Millgate
Arbirlot Road West	Glenogil Drive	Millgate Loan
Barngreen	Guthrie Port	Montrose Road
Benedict Road	Grant Road	Ness Drive (Part)
Bloomfield Road	Gravesend	Newton Avenue
Brechin Road	Greenbank Brae	Nolt Loan Road
Bruce Road	Great Michael Road	Patrick Allen Fraser Street
Brothock Bridge	Hamilton Green	Ponderlaw
Brothock Way	Hamilton Street	Rosemount Road
Burnside Drive	Hayshead Road	Seaton Road
Cairnie Loan	Hill Street	Springfield Terrace
Cairnie Road	Hill Place	St Ninians Road
Cairnie Street	High Street	St Vigeans Road
Catherine Street	Horologe Hill (part)	Stanley Street
Charles Avenue	Hospitalfield Road	Tarry Road
Clova Avenue	Infirmery Brae	Viewfield Road
Cliffburn Road	Keptie Road	Walker Place
Commerce Street	Keptie Street	West Abbey Street
Culloden Terrace	Kinghorn Street	West Port
Doocot Place	Kirk Square	West Way
Elmfield Avenue	Kirkton Road	

BRECHIN

Airlie Street
 Bridge Street
 Caledonian Road
 Castle Street
 Church Street
 Clerk Street
 Commerce Street
 Cookston Road
 Distillery Road
 Drumachlie Loan
 Duke Street
 East Mill Road
 Eddie Avenue
 High Street

Infirmery Road
 Infirmery Street
 Latch Road
 Market Street
 Montrose Street
 North Latch Road
 Panmure Street
 Park Place
 Park Road
 Park View

Pittendreich Road
 Provost Buchan Road
 Provost Millar Avenue
 River Street
 St David Street
 St Mary Street
 Scott Street
 Southesk Street
 Swan Street
 Trinity Fields Cres
 Union Street
 Wards Road
 Witchden Road

CARNOUSTIE

Arbroath Road
 Balmachie Road
 Barry Road
 Carlogie Road
 Church Street
 Dundee Street

Ferrier Street (top half)
 High Street
 Ireland Street
 Kinloch Street
 Newton Road
 Panbride Road
 Queen Street

Station Road
 Thomas Street
 Victoria Street
 West Path
 West Haven Park
 Shanwell Road
 David Moyes Road

FORFAR

Academy Street
 Airlie Crescent
 Arbroath Road
 Castle Street
 Coutties Wynd
 Brechin Road
 Craig O' Loch Road
 Dundee Loan
 Dundee Road
 East High Street
 Gallowshade Road
 Glamis Road
 Glenclova Terrace
 Glenmoy Terrace
 Glenogil Terrace

Gordon Street
 Jamieson Street
 Jeanfield Road
 Kirriemuir Road
 Lilybank Crest/Road
 Market Street
 Montrose Road
 North Loch Road
 North Street
 Old Brechin Road
 Old Halkerton Road
 Orchard Loan
 Orchardbank Loan
 Prior Road
 Queenswell Road

Restenneth Drive
 Robertson Terrace
 St James Road
 South Street
 Station Road
 Strang Street
 Strathmore Avenue
 Taylor Street
 Threewells Drive
 Turfbeg Road
 Victoria Street
 Westfield Loan (Whole)
 West High Street
 Yeaman Street

KIRRIEMUIR

Angle Road
Bank Street
Bellies Brae
Brechin Road
Cortachy Road
Easthill Road
Forfar Road
Glamis Road

Glengate
Golf Road
High Street
Kinnordy Road
Lindsay Street
Lochmill
Marywell Brae
Morrison Street

Reform Street
Roods
St Malcolm's Wynd
School Wynd
Shielhill Road
Slade Road
Tannage Brae
West Hill Road

MONIFIETH

Albert Street (part) Maule Street to Durham Street
Bank Street
Broomhill Drive
Buddon Drive
Church Street
East Navarre Street
Durham Street (part) Bank Street to Albert Street
Ferry Road
Grange Road (part)
West Grange Road to Ferry Road
High Street
Hill Street

Lorne Street
North Balmossie Street
North Union Street
Panmurefield Road
Panmure Street
Reform Street
South Street
The Fairway
Union Street
Victoria Street
West Grange Road

MONTROSE

Academy Square
Annat Road
Basin View
Brechin Road
Bridge Street
Broomfield Road
Caledonia Street
Castle Place
Charleton Road
Christies Lane
Coronation Avenue
Dorward Place
Dorward Road
Erskine Place
Erskine Street
Faulds Road (Part)
Ferry Street
Garrison Road (Part)
George Street

High Street
Hill Street
Hume Street
John Street
India Street
Links Avenue
Lower Hall Street
Medicine Well Drive
Murray Street
Newhame Road
New Wynd
North Esk Road
North Street
Panmure Place
Panmure Terrace
Patons Lane
Provost Reids Road

Provost Scott Road
Rosehill
Rosehill Road (Part)
Rossie Island Road
St Peter's Place
St Peter's Road
Traill Terrace
Union Place
Union Road
Union Row
Union Street
Waterside Road
Wharf Street
Western Road
Whites Place
Craig Road (part)

RURAL ROADS**A CLASS**

A92
A94
A923
A926
A928
A929
A930
A932
A933
A934
A935
A937

C CLASS

C1 Part B978 to B961
C45
C2 Part A92 to A930
C4 Part A92 to B961
C5
C6
C7
C9
C11
C13
C16
C12
C22
C29 Part B9128 to B957
C32 Part A90 to B957
C35 part A90 to B966
C37
C38
C39 (Dubton)
C44
C46
C47
C48
C51
C53 Bractullo Mill
C54
C61
C62 Part A92 to A930
C445
C59
C60
C8

B CLASS

B954 (South section only)
B955 (Part Northmuir only)
B961
B957
B962
B965
B966
B978
B9113
B9127 (Part Arbroath to B961)
B9127 (Douglstown to A90)
B9128
B9134

UNCLASSIFIED

U302
U305 (from A92 via Dobbies to C4)
U307
U322 UP TO C6
U324
U329
U334
U337
U339
U339(2)
U357
U359
U375
U376
U462
U463
U485
U489
U494
U522
U552
U327

(b) PRIORITY FOOTWAYS - MONDAY TO FRIDAY

The weekday priority footway routes are designed to include the main pedestrian destination centres for Monday to Friday travel patterns (shops, schools, business premises, medical centres, day care centres etc). As for priority carriageway routes, these footways include both busy and less heavily trafficked footways for routeing efficiency. In some roads, to maintain efficient gritting/ploughing routes, the footways on one side of the road only may be given priority treatment, with the footway opposite being treated as non-priority.

ARBROATH

Abbey Street	East Muirlands Road	Lochlands Street
Abbey Park	East Abbey Street	Lochlands Drive
Abbey Path	East Kirkton Road	Lordburn
Abbot Street (part)	Elgin Place	Market Place
Applegate	Ernest Street	Mayfield Shops
Academy Street	Fisheracre	Millgate
Addison Place	Grant Road	Millgate Loan
Allan Street	Gravesend	Montrose Road
Arbirlot Road	Guthrie Port	Ponderlaw
Arbirlot Road West	Hamilton Green	Ponderlaw Lane
Bakers Wynd	Hume Street	Rosemount Road
Barbers Croft	Hayshead Road	Seaton Road
Barngreen	Hays Lane	Spink Street
Bloomfield Road	Hays Terrace	Springfield Terrace
Brechin Road	Hayswell Road	Stanley Street
Brothock Bridge	Helen Street	St Abbs Road
Bruce Road	Hill Place	St Ninians Road
Burnside Drive (part)	Hill Street	St Vigeans Road
Cairnie Loan	Hill Terrace	Timmergreens shops
Cairnie Road	High Street	Viewfield Road
Cairnie Street	Horologe Hill	Warddykes Avenue (part)
Catherine Street	Keptie Street	Warddykes Road (part)
Charles Avenue	Keptie Road	Walker Place
Cliffburn Road	Kirk Square	Wesley Gardens
Commerce Street	Kirkton Road (part)	West Abbey Street
Culloden Crescent	Ladyloan	West Port
Culloden Terrace	Leonard Street	Westway
Dundee Road	Linton Road	
Emislaw Drive	Link path to Inverbrothock School	

BRECHIN

Airlie Street
 Bridge Street
 Castle Street
 Church Street
 City Road
 Clerk Street (incl
 McGregor St)
 Commerce Street
 Cookston Road
 Dalhousie Street
 Distillery Road
 Drumachlie Loan

Duke Street
 Gallowhill
 High Street
 Infirmary Road
 Infirmary Street
 Latch Road
 Link Path to School
 (Strachans Park to
 Drumachlie)
 Market Street
 Montrose Street
 North Latch Road

Panmure Street
 Scott Street
 Southesk Street
 St Davids Street
 St Mary Street
 St Ninians Square
 Swan Street
 Trinity Road
 Union Street
 Witchden

CARNOUSTIE

Anderson Street
 Arbroath Road (to
 Ireland Street)
 Balmachie Road
 Barry Road
 Bonella Street
 Carlogie Road
 Church Street
 Dalhousie Street
 Dundee Street

Ferrier Street
 High Street
 Ireland Street
 Kinloch Street/Park
 Lochty Street
 Links Avenue
 Mckenzie Street
 Maule Street
 Newton Road

Panbride Road
 Park Avenue
 Queen Street
 Ruxton Place
 Shanwell Road
 Station Road
 Thomas Street
 Victoria Street
 West Path
 James Street

FORFAR

Academy Street
 Arbroath Road
 Bankhead Road
 Boyles Close
 Brechin Road
 Castle Street
 Craig O'Loch Road
 Coutties Wynd
 Dundee Loan
 Dundee Road
 East High Street

Glamis Road
 Lowson Avenue
 Lentlands Road
 Market Street
 Montrose Road
 Myre Road (part)
 New Road
 North Street
 Orchard Loan
 Prior Road
 Queenswell Road

Robertson Terrace
 South Street
 St James Road
 Station Road
 Taranty Road
 Taylor Street
 The Cross
 Victoria Street
 West High Street
 Westfield Loan
 Fyfe St + path + Service Rd

KIRRIEMUIR

Bank Close
 Bank Street
 Bellies Brae
 Brechin Road
 Clova Road
 Crofthead
 Cumberland Close
 Forfar Road
 Glamis Road
 Glengate
 Gordon Park
 High Street

Isla Road
 Jamieson Close
 Kirkton Court
 Knowehead
 Knowehead Crescent
 Lesser Roods
 Lindsay Street
 Manse Close
 Marywell Brae
 Middlefield
 Morrison Street
 Ogilvy's Close

Prosen Road
 Reform Street
 Rogers Close
 Roods
 School Wynd
 Shielhill Road
 Sidlaw Range
 St Malcolm's Wynd
 St Colme's Close
 Tannage Brae
 Whiteside

MONIFIETH

Albert Street (Maule Street to Hill Street)
 Brook Street (Tay Street to Reform Street)
 Church Street
 East Navarre Street
 Ferry Road
 Grange Road

High Street
 Hill Street
 Lorne Street (Hill Street to High Street)
 Maule Street
 North Balmossie Street
 North Union Street

Panmure Street (part)
 Panmurefield Road
 Reform Street (High Street to Brook Street)
 Tay Street (High Street to Brook Street)
 Victoria Street

MONTROSE

Baltic Street
 Basin View – cycle track to Medicinewell Park
 Brechin Road
 Bridge Street
 Castle Place
 George Street
 High Street
 Hume Street
 John Street

Kincardine Street
 Lower Hall Street
 Market Street
 Mill Street
 Mount Road
 Murray Street
 Newhame Road
 New Wynd
 North Street
 Northesk Road

Nursery Road
 Rosehill Road
 The Mall
 Upper Hall Street
 Victoria Bridge
 Western Road
 Western Road North

(c) PRIORITY FOOTWAYS – SATURDAY AND SUNDAY

The weekend priority footway routes are designed to include only the town centres and busy shopping areas where the majority of weekend pedestrian activity takes place (eg not including schools, business premises etc). As with other priority routes however these weekend routes will include some less heavily trafficked footways for routing efficiency. In some roads, to maintain efficient gritting/ploughing routes, the footway on one side of the road only may be given priority treatment, with the footway opposite being treated as a non-priority.

ARBROATH

Abbey Street	Gravesend	Springfield Terrace
Abbey Park	Guthrie Port	Stanley Street
Abbey Path	Hamilton Green	St Ninians Road
Abbot Street (part)	Hume Street	St Vigeans Road
Applegate	Helen Street	Timmergreens shops
Academy Street	Hill Place	Walker Place
Addison Place	Hill Street	Wesley Gardens
Allan Street	Hill Terrace	West Abbey Street
Arbirlot Road	High Street	West Port
Bakers Wynd	Keptie Street	
Barbers Croft	Keptie Road	
Barngreen	Kirk Square	
Brechin Road	Kirkton Road (part)	
Brothock Bridge	Leonard Street	
Burnside Drive (part)	Lochlands Street	
Cairnie Loan	Lordburn	
Cairnie Road	Market Place	
Cairnie Street	Mayfield Shops	
Catherine Street	Millgate	
Commerce Street	Millgate Loan	
Culloden Terrace	Montrose Road (part)	
Emslaw Drive	Ponderlaw	
East Abbey Street	Ponderlaw Lane	
Elgin Place	Rosemount Road	
Fisheracre	Seaton Road (part)	
Grant Road	Spink Street	

BRECHIN

Church Street	Market Street
City Road	Montrose Street
Clerk Street (incl McGregor St)	Panmure Street
Commerce Street	Southesk Street
Distillery Road	St Davids Street
Gallowhill	St Mary Street
High Street	St Ninians Square
Infirmay Road	Swan Street
Infirmay Street	Trinity Road (part)
Latch Road	Union Street

CARNOUSTIE

Arbroath Road (to
Ireland Street)
Balmachie Road
Barry Road (part)
Bonella Street
Carlogie Road (part)
Church Street
Dundee Street
Ferrier Street
High Street
West Path

FORFAR

Academy Street
Arbroath Road (part)
Boyles Close
Brechin Road
Castle Street
Craig O'Loch Road
Coutties Wynd
Dundee Loan
Dundee Road (part)
East High Street

Glamis Road (part)
Market Street (part)
Montrose Road (part)
Myre Road (part)
New Road
North Street
Queenswell Road
South Street (part)
The Cross
Victoria Street

West High Street

KIRRIEMUIR

Bank Street
Bellies Brae
Brechin Road (part)
Forfar Road
Glamis Road (part)
Glengate
High Street

Knowehead
Lesser Roods
Lindsay Street
Marywell Brae
Morrison Street
Ogilvy's Close
Reform Street

Roods
School Wynd
Shielhill Road (part)
St Malcolm's Wynd
Tannage Brae

MONIFIETH

Brook Street (Tay Street to
Reform Street)
Ferry Road
High Street
Maule Street
North Union Street
Panmure Street (part)

Reform Street (High Street
to Brook Street)
Tay Street (High Street to
Brook Street)
Victoria Street

MONTROSE

Bridge Street
Castle Place
George Street
High Street
Hume Street
Lower Hall Street
Murray Street

Northesk Road
Western Road (up to
Lower Hall Street)

d) **AUXILIARY ROUTES (CARRIAGEWAYS) -7 day cover – Glens and higher routes**06.00 - 16.00 Hrs Monday to Friday and 05.00 – 08.00 Sat and Sun**Route K39**B955
C30
U412
C31
C32
U400
C29
U401
U402**Route K42**B951
C25
U90(part)
U389
C26
U92
U388**Route K43**B954
C24
U391
U392(1)
U392
U388
U388(2)
U388(1)
U390 (bottom section)**Route K44**B955
U405**Route K45**C25
C27
U394
U404
C28**B23A**U409
U409(1)
U410
U410(1)
U411
U411(1)**Route B21**C30
U406
U371
U407
C31
U415
U416
C33**Route B24**C35
C34
Church Street, Edzell
Dalhousie Street, Edzell
U428
U419
U420
U422**Route B25**C36
U424
U425
U426
U427
U429 (C30 to C35)**Route T1W**

U338 Sat/Sun only

Route A4W

C52 Sat/Sun only

(d) **AUXILIARY ROUTES (CARRIAGEWAYS) – 5 day cover**MONDAY - FRIDAY - 06.00 - 16.00 Hrs

Route M 48	Route A19	Route T51A	Route B22A
C35	B9127	U340	U454
C40	C52	C10	U455
C41	U301	U342	U457
U433	U308	U341	U457(1)
U434	U308(1)	U331	U457(2)
U435	U308(3)	U330(1)	
U437	U310	U330	
U442	U499	U329(2)	
U444	U499(2)	C11	
U444(1)	U501	U327	
U519		U343 +U338	