REPORT TO: **PLANNING AND TRANSPORTATION COMMITTEE – 30 AUGUST 2004**

REPORT ON: **REVIEW OF WINTER MAINTENANCE OPERATIONS**

REPORT BY: **DIRECTOR OF PLANNING AND TRANSPORTATION**

REPORT NO: **544-2004**

1 PURPOSE OF REPORT

1.1 The purpose of this report is to advise Committee of proposed short-term and medium-term measures aimed at improving the Winter Maintenance service.

2 RECOMMENDATION

2.1 It is recommended that Committee note the contents of this report and approve:

a The purchase of approximately 100 additional grit bins for inclusion within housing areas for footpaths not currently covered by grit bins;

b The establishment of five 'Hit Squads' and the purchase of twenty barrow gritters for tackling footpaths in problem areas;

c The commissioning of the updated thermal mapping surveys and use of the new Route Optimisation software; and

d The use of Global Positioning Satellite (GPS) technology on a trial basis within some of the road-gritter vehicles and footway ploughs.

3 FINANCIAL IMPLICATION

3.1 Proposed changes to the service referred to in the report amounting to £50,000 in the current year will be met from the winter maintenance revenue budget for 2004/05.

3.2 The winter maintenance revenue budget provision for 2004/05 is £752,000. This budget provision is based on a mild/medium winter. In the event that the winter is not mild and the budget provision proves insufficient, then the Planning & Transportation Department will make every effort to contain any overspend within their overall Departmental Revenue Budget. However, it should be noted that this could have an effect on the overall workload available to Tayside Contracts.

4 LOCAL AGENDA 21 IMPLICATIONS

4.1 Salt is one of the most effective and economically viable means of de-icing road networks. Potentially detrimental effects on the roadside environment is minimised by the control of the rate and angle of spread of the salt. The introduction of salt additive as described in the report should lead to reductions in the quantity of salt used and to its corrosive and environmental effects.

5 EQUAL OPPORTUNITIES IMPLICATIONS

5.1 Improvements to the winter maintenance service, particularly in relation to footpaths, will reduce impediments to continued normal activity of elderly and mobility impaired citizens.

6 BACKGROUND

6.1 Key Issues

The need to carry out a review of winter maintenance operations has been brought about by the following key issues:

6.1.1 concerns raised by members regarding the treatment of all of the network of footways and footpaths throughout the city following snowfall, particularly in early January 2004.

6.1.2 measures required to ensure that regulations relating to working time and drivers' hours are complied with and that exemptions relating to emergency situations are correctly adhered to;

6.1.3 the continued monitoring of suitability of new developments in materials and technology relating to winter maintenance operations.

6.2 Footways and Footpaths

Although the standard of snow clearing on carriageways is generally considered to be to a high standard, concerns were raised by a number of members last winter about the times taken to clear the entire network of footways and footpaths of snow, particularly after it had frozen.

6.2.1 Adopted Footways

All adopted footways in the city are allocated to either High Priority Routes or Low Priority Lists as described in the Annual Winter Maintenance Policy and Level of Service Report. This level of service exceeds that provided by most Roads/Highways Authorities in the country where footway treatment is often restricted to particular locations e.g. at shops and schools.

High Priority footways are those on bus routes and in main shopping areas, due to their higher pedestrian flows, and are cleared before Low Priority footways, normally while snow is still soft. Due to the lengths of footways involved, roughly double that of carriageways, and the relatively slow speed of mini-ploughs, the footway network can take some days to get round. This is particularly the case during lengthy or repeated snow shower conditions or if surface temperatures fall such that wet or compacted snow freezes and can no longer be ploughed but only salted. Without ploughing, salt can take a considerable time to break up ice when temperatures remain low and pedestrian traffic is light, as is often the case in these conditions. Thus most complaints relate to the Low Priority footways, predominantly in residential areas.

It is believed that reports of adopted footways not having been treated often occur (1) because a mini-plough has not yet reached the location and (2) during the period

between salting taking place and becoming fully effective. This is exacerbated by the white salt used not contrasting with the frozen surface and can initially appear as though the surface has not been treated.

Tayside Contracts is presently assessing satellite tracking equipment for fitting to vehicles and it is envisaged that a small number of devices will be trialled on some winter maintenance vehicles in 2004/05, with a view to extending their use in future years. If linked to onboard devices for recording salt spreading details (carriageway gritters) this will provide a useful management information system. From the Council's perspective this proposal would not only provide valuable back-up information for defending public liability claims, but if extended to footway ploughs, would also enable records to be produced of where and when treatment had occurred.

6.2.2 Housing Department Footpaths

Within many of the housing estates, the footpaths are not adopted and are not covered by the above regime. On these footpaths, snow clearing has normally been carried out by employees of Waste Management department after clearing accesses to communal bins at multi-storey blocks etc. Housing/Waste Management also operate a priority system for footpath snow clearing, with sheltered housing areas being treated first. However, much of this service is normally only available for a relatively short duration whilst waste collection is affected by the weather, in contrast to treatment of adopted footways, which continues after snowfall until substantial completion, or until a thaw occurs. Consequently, housing estates with large networks of footpaths (remote from the road) such as Mill O' Mains, will potentially remain untreated for a considerable time under the present regime.

In the long term, it is intended to bring as much of the housing footpath stock as practicable under the direct management of the Planning and Transportation department and this process has been commenced via the Quality of Life footpath programme.

To alleviate this problem in the short term, it is proposed to locate and service approximately 100 additional grit bins on Housing footpaths which meet the relevant criteria as applied on the adopted network (significant gradients or steps). Housing Department staff are presently identifying suitable locations meeting these criteria. It is envisaged that any additional labour required to refill these bins during adverse weather can be provided by arrangement with Leisure and Arts Department.

The use of mini-ploughs on Housing footpaths, as used on adopted footways, has also been considered. This would require Tayside Contracts to extend its present fleet and would consequently increase Standing Charges paid by the Council. The lead-in time required and restrictions on Tayside Contracts capital expenditure and subsequent order/delivery times preclude the use of these during the forthcoming winter. Additionally, following an initial survey it is clear that a significant proportion of the Housing footpath network is not suited to such vehicles due to the presence of steps, tight corners and dead ends. Further investigation of the feasibility of this proposal and preparation of future gritting routes will be undertaken over the next year.

In the short term and to deal with areas with access difficulties, it is considered that manually operated barrow gritters could be utilised in gritting Housing footpaths, providing more efficient and faster treatment than spreading from shovels. It is proposed that in snow conditions five “Hit Squads” will be formed, each consisting of a pick-up truck and driver, a supply of salt and four operatives with barrow gritters. These would be sent to locations where particular problems were being experienced. Tayside Contracts will purchase twenty barrow gritters for footpath use this winter. Thereafter, an assessment will be made regarding possible extension of this service subject to its success, any further demand and availability of resources. It is expected that DCS Parks employees who presently assist with hand gritting in snow/ice conditions would be utilised for this activity.

6.2.3 Operational Hours

Within the current approved Policy and Level of Service Report the treatment of adopted footways has been restricted to only High Priority Routes on Saturdays with no coverage on Sundays and Public Holidays (other than the third day at New Year), On 1 January 2004 no footway treatment was carried out in accordance with this policy and this led to much of the concerns subsequently raised by members. To avoid a repeat of this situation, it is proposed to introduce a more universal approach to footways coverage within the next Policy Report which will be submitted to Committee in September 2004.

6.3 Carriageway Gritting and Drivers’ Hours

6.3.1 Level of Resources

The total number of Tayside Contracts’ construction employees based at Fairmuir Depot, Dundee has fallen in recent years, leading to a lack of spare capacity in the provision of a guaranteed winter and emergency service outwith normal working hours. This has been largely brought about by the following events:

1 A substantial reduction in budgets for structural and cyclic road maintenance, over the years has affected the number of employees that Tayside Contracts has available;

2 Changes to the way that working time and driver's' hours are managed;

3 The maintenance of low threshold levels for awarding work to Tayside Contracts, as encapsulated in the Council's Best Value submission to the Scottish Office in 1998.

In the case of snow clearing activities, this shortfall has been partially offset in the past two years by the deployment of DCS Parks employees for the operation of mini-ploughs used to clear footways.

6.3.2 Restrictions in Drivers' Hours

The need for a larger pool of HGV drivers for the operation of carriageway gritters has been identified as a result of the Traffic Inspectorate emphasising that precautionary salting ("evening pre-grits"), early morning salting and snow clearing following forecast moderate snowfall, will not be eligible for exemption from the

provisions of the Drivers' Hours Regulations on emergency grounds. To enable drivers to achieve the minimum rest hours requirements, a review of working shift patterns has recently been carried out by Tayside Contracts.

Various options have been considered and negotiations with the drivers and their trade unions on a preferred solution are being carried out by Tayside Contracts. It is estimated that the preferred proposal will require the provision of a further 13-15 HGV drivers to be made available for gritting duties.

Changes in trunk road winter maintenance arrangements, presently sub-contracted by BEAR (Scotland) to Tayside Contracts, is expected to make available 4 HGV drivers in Dundee. The balance will be provided by training existing roads and street lighting employees to HGV standard over the coming weeks, and preliminary assessment training is ongoing. Should any shortfall still exist a preliminary approach to DCS regarding potential HGV drivers from the Parks workforce will be followed up. Since street lighting employees have not previously been utilised for winter maintenance duties, it is possible that this arrangement could have a slight detrimental effect on street lighting repairs and performance indicators but it is thought that any such effect would be marginal.

6.4 **Utilising New Developments in Winter Maintenance Technology**

6.4.1 Thermal Mapping and Route Optimisation

The Dundee High Priority carriageway routes were surveyed and base thermal maps produced in 1997/98. This information was used to rationalise the gritting routes such that a slight reduction in the number of gritters required was achieved. The revised routes were compiled grouping together roads with similar thermal characteristics, enabling routes to be classified as "cold", "intermediate" or "warm". This in turn has enabled selective gritting to be carried out on nights where marginal road surface temperatures are forecast and only parts of the network are at risk of frost. A daily forecast thermal map of the network is provided electronically based on forecast temperatures and overall cloud cover, and this can be time-stepped through the night to establish which routes are likely to freeze and at what time.

To take account of additions to and deletions from routes, changes to road layouts, changes of road surfaces (e.g. Stone Mastic Asphalt, now widely used, has different thermal characteristics to conventional Hot Rolled Asphalt) and the thermal effects of changes adjacent to roads e.g. major demolitions, it is recommended that the thermal map surveys are repeated every 5-7 years. Since 7 years have now elapsed from the initial survey, it is proposed that a variation order should be issued to the Ice Prediction System provider Vaisala to carry out a further thermal survey of the High Priority network during the forthcoming winter.

As well as ensuring reliable daily information, the results of the new survey could be used to carry out further route optimisation prior to winter 2005/06. This could result in a trimming of duplicated and dead mileage, an inevitable factor in an urban situation, and may enable a further reduction in the size of gritting fleet required.

6.4.2 Pre-wetted Salt and Salt Additive

The ability to spread pre-wetted (or "wet on dry") salt presently exists only on the nightshift gritter, a larger capacity vehicle than those used on daytime routes.

This vehicle is equipped with brine storage tanks and spreading equipment that enables salt to adhere to the road surface even in dry or windy conditions. Brine is transported as required to a holding tank from Tayside Contracts mixing facility at Forfar. This technique is particularly useful for the nightshift operation due to the length of the route, covering strategic roads throughout the city, and the need for the salt to remain evenly spread for a number of hours prior to frost or ice forming. Extending this facility throughout the fleet would entail major capital expenditure on vehicle purchase/adaptation and large-scale mixing and storage facilities for the brine component.

Similar improved performance in terms of adhesion, duration on the road surface and lower spread rates required can be achieved by the use of a recently developed salt additive. This is also believed to improve the salt's performance at very low temperatures and significantly reduce the corrosive effects of salt on winter maintenance vehicles. The material used is a biodegradable food industry by-product that is understood to have no adverse effects on the environment, and has been approved by the Scottish Environmental Protection Agency (SEPA). A small proportion of the salt stock was treated last winter and the mixed material was used on the routes covered by one gritter. Even using a 25% lower spread rate, the salt's effectiveness on these routes appeared to exceed that on conventionally treated routes. Due to the high possible public liability implications of reducing salt coverage, it is considered that more objective analysis of this material's performance is required before applying to all routes. It is therefore proposed to extend the trial further this winter (to 2 or 3 vehicles), to further observe and if possible measure its performance, and to seek results of similar trials from other authorities. The costs of treating salt with the additive is offset by the effects of reduced spread rates and the longer residual life of salt on the road surface.

The ability to reduce the amount of salt used with this material could have a significant affect on the future planning of gritting routes and the size of the gritting fleet required.

6.4.3 GPS Tracking of Vehicles

As referred to in Section 6.2.1 above, Tayside Contracts is investigating the use of GPS satellite tracking on vehicles used for a range of activities, and in the case of carriageway gritters, linking the system to existing means of monitoring the rate and pattern of salt spread on some newer gritting vehicles. Following an unsuccessful venture with an early version of similar equipment some years ago, a limited trial is expected to take place in the near future. If successful from a technical aspect, the costs and benefits to Tayside Contracts and its constituent authorities will be assessed with a view to extending the use of this technology.

6.4.4 Salt Storage

At present all salt used in Dundee is stored at the Marchbanks depot. The salt is stored in an area of the site which is not surfaced or prepared and is also stored in an

uncovered stockpile. The decision not to cover the salt stockpiles with tarpaulins was taken several years ago following safety concerns associated with voids forming in covered salt stockpiles. It is estimated that some 4% of the stock is lost annually by leaching. Comparison of the survey of end-of-season stocks with recorded salt usage has indicated that this percentage loss was exceeded last year. This is related to a build up of surface water in the depot following the effects on drainage of construction works associated with recent Waste Management improvements at the shared Marchbanks depot.

To prevent a further occurrence of this salt loss, it is proposed that during 2004/2005 salt stocks should be confined to the higher end of the depot and that the offer of a salt management arrangement should be agreed with the supplier such that a reduced stock is kept at Marchbanks with guaranteed topping up of the salt being provided by the supplier from further stocks held at docks and/or priority supply from salt shipments over the winter months.

Due to the unmade ground surface at this part of the depot it will be necessary for salt presently stored here to be screened to remove potentially dangerous stones. To prevent further contamination of new stock occurring during the loading of vehicles, surfacing of this area will be undertaken prior to the main salt delivery in August.

In the longer term, to prevent any loss through leaching and to enable a full year's stock to be stored when prices are most favourable, the future purchase and construction of a salt barn should be given consideration. This would be reviewed along with the long-term availability of Marchbanks depot for salt storage and may be suitable candidate for funding through the prudential code. If appropriate, a further Report will be brought forward on this matter in due course.

7 CONSULTATIONS

The Chief Executive, Depute Chief Executive (Support Services), Depute Chief Executive (Finance), Assistant Chief Executive (Community Planning), Director of Housing, Director of Dundee Contract Services, Director of Leisure and Arts, Head of Waste Management and Managing Director of Tayside Contracts have been consulted and are in agreement with the contents of this report.

8 BACKGROUND PAPERS

8.1 None.

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