
HIGHWAY WINTER MAINTENANCE OPERATIONAL PLAN 2008/09

**Responsible Cabinet Member – Councillor David Lyonette, Transport Portfolio
Responsible Director - Cliff Brown, Director of Community Services**

SUMMARY REPORT

Purpose of the Report

1. To provide details of potential modifications to the Highway Winter Maintenance Operational Plan for the coming winter 2008/09.

Summary

2. The Council has a statutory duty to ensure the passage along a highway is not endangered by snow or ice, so far as is reasonably practicable. The Highway Winter Maintenance Plan is in place to ensure this duty is undertaken.
3. The cost of the Winter Maintenance service is dependant on the severity of the winter. A review has been undertaken during the summer to ensure the plan is current and up to date and investigate any potential efficiencies in the operation. The review has considered:
 - (a) Changing the type of product used to treat the road.
 - (b) Reviewing the pre-salting routes to ensure all roads treated meet criteria in the plan. The review has identified a number of roads that can be removed.
4. The review examined the length of the winter maintenance season given changes in climate patterns. The analysis identifies that the current cover period is appropriate.

Recommendation

5. It is recommended that Members approve the modifications to the Highway Winter Maintenance Plan as identified in this report.

Reasons

6. The recommendation is supported in order to ensure that the statutory duty is fulfilled and the modifications are included to ensure the plan is current and operating efficiently.

**Cliff Brown
Director of Community Services**

Background Papers

- (i) 'Delivering Best Value in Highway Maintenance' published by the Institution of Highways and Transportation'.
- (ii) 'The Institution of Civil Engineers Design and Practice Guide : Highway Winter Maintenance'.
- (iii) DBC Highway Winter Maintenance Operational Plan.

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S17 Crime and Disorder	This report has no implications for Crime and Disorder.
Health and Well Being	There are no issues relating to Health and Well Being contained in this report.
Sustainability	The proposed modifications will reduce the amount of fuel used as part of the operation. The modifications will mean a reduction of 22 miles per shift. On average each season there are approximately 136 shifts. This will save 2992 miles. This approximately equates to 1360 litres of fuel helping to reduce the carbon footprint of the Borough. The modifications will also reduce the use of rock salt, which is a natural resource, by 396 tonnes. (All calculations on the basis of an average winter)
Diversity	The content of the report impacts equally across all groups.
Wards Affected	The plan affects all the residents of Darlington.
Groups Affected	The content of the report impacts equally across all groups.
Budget and Policy Framework	The modifications proposed assist in reducing the cost of the service and achieving the reduction in budget provision in the MTFP.
Key Decision	The modifications to the Highway Winter Services Operational Plan are a key decision as it affects all the residents of Darlington.
Urgent Decision	For the purpose of the 'call-in' procedure this does not represent an urgent matter.
One Darlington: Perfectly Placed	The objective of the winter maintenance service is to try and maintain communications and reasonable travel certainty during adverse weather conditions. These align to the following themes: Prosperous: ensuring Darlington is accessible, particularly in periods of adverse weather, to ensure business continuity. Greener: the plan has a priority to cover the bus network and thus ensure sustainable modes are given priority access and reliability. Greener: managing the service effectively and efficiently to minimise the use of natural resources (rock salt and fuel) contributing to a low carbon Borough. Safer: reducing the potential for road traffic accidents in adverse weather and providing public reassurance of a safer highway network.

MAIN REPORT

Information and Analysis

7. The Council has a statutory duty to ensure the passage along a highway is not endangered by snow or ice, so far as is reasonably practicable.
8. In consideration of this duty the Council has in place a Highway Winter Maintenance Operational Plan which details priorities and how the service is operated. This will be the sixth winter that the plan has been used. The plan has had minor alterations but it has provided a sound basis for the Council's winter maintenance operations.
9. The main criteria used in determining routes are as follows:
 - (a) Links to the national road network, industry, commercial and business centres.
 - (b) Maintain public transport and access by emergency services.
 - (c) Journeys to and from work and education.
10. An overview of the Winter Maintenance Plan is set out in **Appendix 1**.
11. The cost of the Winter Maintenance service is dependant on the severity of the winter. A review has been undertaken during the summer to ensure the plan is up to date and to investigate any potential efficiency in the operation to achieve a planned MTFP saving.
12. The Review has focussed on three areas of the operation:
 - (a) The use and effectiveness of Ecothaw (a rock salt additive).

As part of the review an assessment of the benefit of using Ecothaw was undertaken and found that the benefits are not being realised. The proposal is to revert back to normal rock salt, which is less expensive. Analysis on an "average" winter demonstrates a potential annual saving of approximately £16,800 based on the current price.

Details of the analysis are contained at **Appendix 2**.

- (b) A review of the current pre-salting routes.

The recent bus network review has also altered the bus routes within the town. This has had a 'knock-on' effect on whether a road meets the criteria for treating or not.

The bus network is designed to ensure most residents are within 400m of a bus stop. Including bus routes in the winter maintenance plan we ensure most residents are within a reasonable distance of a treated route.

It is proposed that routes that are not now bus routes and do not meet any other criteria in the plan are removed from the planned routes.

The review has identified a number of other roads that do not meet the criteria.

If this recommendation is accepted the total length of carriageway pre-treated would be reduced from 212.5 miles to 190.5 miles.

This would give a 10.35% saving on salt usage in an average winter, which equates to 396 tonnes of salt and saving £9,340 at present salt cost.

This has an associated fuel saving in terms of reducing the Council's carbon footprint and also reduces the use of natural resources.

Details of the analysis are contained at **Appendix 3**.

(c) The length of the winter season.

An analysis of the last eight winter seasons has been undertaken to assess whether the season can be shortened.

The analysis does not identify an ability to reduce the length of the season. It is therefore recommended that the season remains at 30 weeks and is reviewed regularly with ongoing changes in climate pattern.

Details of the analysis are contained at **Appendix 4**.

Financial Implications

13. It is difficult to set a budget for a statutory service that is dependant upon weather conditions. There is always a risk of overspend depending on the nature of weather experienced in the season.
14. The operational budget for the service this winter (2008/09) is £309k, which includes an efficiency target agreed as part of the latest MTFP review.
15. The modifications identified in this review should achieve at least a £26.2k saving if we experience an average winter. With potential fuel and route savings still to be finalised if the recommendations are accepted this may exceed a £30k efficiency in budget. However, there still remains a risk of exceeding the budget, unless we have an extremely mild winter.
16. Fuel increases have not been factored into this process and it is likely that the recent increases will result in additional costs and pressure on the budget provision.

Outcome of Consultation

17. The Highway Winter Maintenance Operational Plan is a management document used to demonstrate a statutory duty. The plan has not been subject to external consultation.

Overview of the Winter Maintenance Operational Plan

The plan has been developed in accordance with principles contained in 'Delivering Best Value in Highway Maintenance' published by the Institution of Highways and Transportation and 'The Institution of Civil Engineers Design and Practice Guide : Highway Winter Maintenance'.

The Winter Maintenance Operational Plan is implemented between 1 October to 30 April and cover is provided on a 24/7 basis.

The Meteorological Office provides weather forecasts every day which include road surface temperature information. These forecasts are part of a computer based Ice Prediction system that utilises atmospheric and road surface temperature information from mini roadside weather stations, two of which are in the Borough and two on the periphery. This information, along with weather forecasts, is used to help determine the appropriate action.

This judgement is essential in ensuring effective use of available resources. Decisions are based on information as to whether resources are mobilised or not is often borderline and costs can escalate if this is not managed effectively with informed decision making.

There are three principal winter operations:

1. **Pre-treatment, commonly known as 'precautionary salting' to prevent ice forming**

In general precautionary salting takes place at 5.00am and 7.00pm but the precise times and extent depends on the prevailing and predicted weather conditions. In snow conditions 24 hour operations are often required.

The Borough is divided into eight predetermined road gritting routes, each taking between one and a half and two hours to complete. In 2007/08 approximately 66% of the adopted highway network was included on these routes, amounting to in excess of 200 miles (320 Km) of road. In extreme icy conditions a number of additional roads are also salted.

2. **Post-Treatment, commonly known as 'post-salting to melt ice and snow that has already formed.**

3. **Snow clearing to remove significant accumulations of snow by the use of snow ploughs, other heavy machinery and manual labour.**

In snow conditions the main objective is to maintain and/or restore communications over all or part of the highway network by snow clearance, in the first instance for public transport, emergency services and industrial traffic. This may mean that non-essential routes will not be treated until the essential communication links are restored.

The main factors used in drawing up the predetermined routes are to maintain:

- (a) Links to the national road network, industry, commercial and business centres.

- (b) Maintain public transport and access by emergency services.
- (c) Journeys to and from work and education.

Pedestrian Areas

In frosty conditions the Action Plan for the Town Centre is implemented. Essentially this comprises a schedule of footways and pedestrian routes, crossing points and accesses to buildings with high pedestrian usage, which are treated on a priority basis. In general other footways are not treated during periods of frosty conditions. However, in prolonged extreme conditions where ice/snow is present for in excess of 4-5 days, footways other than those included in the Action Plan for the Town Centre Footways will be treated on a needs basis as resources permit.

Cycle Tracks

Cycle tracks are not normally treated except in prolonged extreme conditions where ice/snow is present for in excess of 4-5 days.

Deployment

Once the decision to salt has been taken, gritters are deployed to treat the network, either in total or in part, depending upon the prevailing and predicted weather conditions.

The need and extent of salting footways and cycle tracks is also determined.

The timing of the salting is dictated primarily by these weather conditions but potential traffic conditions are also taken into account.

Publicity

Prior to the start of the Winter publicity is prepared which will provide a brief guide to winter services in Darlington. It will also show the routes and give general background and useful hints on winter driving.

The Use and Effectiveness of Ecothaw (a Rock Salt Additive)

Ecothaw is an alternative to normal rock salt. It was first introduced to try and reduce the amount of salt used as it is claimed that it remained longer on the carriageway than normal rock salt and therefore reduced the overall amount of salt required. It has been used on the rural roads in the Borough as a de-icing salt since the winter of 2003/04.

Assessment of Benefit

The review has identified that exactly the same amount of Ecothaw was used as rock salt with no evidence that it remained longer on the carriageway surface.

Ecothaw is more effective at melting snow and ice at very low temperatures working up to – 32°C compared to rock salt which is only effective up to –10°C. It is very rare for road temperatures to drop to below –10 C in this area and it is therefore not required for this purpose.

It was also claimed that Ecothaw would reduce the amount of corrosion to the salting vehicles. All our vehicles are washed down thoroughly after use to prevent corrosion. This practice negates any potential benefit that this product may provide.

Ecothaw has only been used on the rural routes, which are generally colder and salted more frequently, a higher proportion of Ecothaw is used than rock salt.

Annual Salt Usage

Season	Rock Salt (Tonnes)	Ecothaw (Tonnes)	Total	Remarks
2002/03	3,220		3,220	
2003/04			4,035	Ecothaw used, no 'split' information available.
2004/05			4,453	Ecothaw used, no 'split' information available.
2005/06			4,823	Ecothaw used, no 'split' information available.
2006/07	955	1,526	2,481	
2007/08	1,900	2,034	3,934	Rock salt used when Ecothaw stock exhausted
Total			22,946	Average 3824 tonnes per year.

The records for the 2006/07 season are the only available figures where Ecothaw was used throughout the season; this has been used to calculate the overall proportion of rock salt used against Ecothaw. The ratio is 38% rock salt and 62% Ecothaw.

The table demonstrated the average amount of salt used in the past six seasons is 3,824 tonnes.

This equates to 2,370 tonnes of Ecothaw per season using the 2006/07 ratio.

At present Ecothaw costs £30.75 against £23.66 for rock salt and is therefore £7.09 per tonne more expensive. All of our salt is procured on a Tees Valley wide joint procurement basis to secure savings with economies of scale.

If rock salt were used on all routes then this would give an annual saving of approximately £16,800 based on the current price in an average winter.

A review of the Current Pre-Salting Routes

Urban Areas

The urban area is split up into three pre-salting routes. This covers 89 miles of carriageway and a total travelling distance of approximately 112 miles per salting shift.

Rural Areas

The rural area is split up into five pre-salting routes. This covers 123.5 miles of carriageway and a total travelling distance of approximately 186 miles per salting shift.

The number of routes is calculated so that they can be treated within two hours and ensures that the morning shift, which generally starts at 5:00am, can be completed before 7:00am or the evening shift that starts at 7:00pm can be completed before 9:00pm. These times can be varied depending on the information and circumstances.

All main roads and bus routes are pre-treated as part of the plan.

The review has identified a number of roads that do not meet the criteria.

The recent bus network review has also altered the bus routes within the town. This has had a 'knock-on' effect on whether or not a road meets the criteria for gritting.

It is proposed that routes that are not now bus routes, or do not meet any other criteria in the plan, are removed from the planned routes.

If this recommendation is accepted the total length of carriageway pre-treated would be reduced from 212.5 miles to 190.5 miles.

This means a reduction of 22 miles per shift. On average each season there are approximately 136 shifts. This will save 2,992 miles in an average winter. This approximately equates to 1500 litres of fuel, a saving of £960 and a reduction in the carbon footprint of the Borough.

The streets that are no longer bus routes or do not meet the criteria are proposed to be removed from the gritting plan. These are shown in the table below:

URBAN AREA

Route P1	Route P2	Route P3
Baydale Road	Banks Road	Arthur Street
Bedford Street	Brankin Road (North)	Chesnut Street
Borough Road South	Bourne Avenue	Corporation Road
Brunswick Street	Burnside Road	Eggleston View (West)
Carroll Road	Claremont Road	Greenbank Road
Clare Avenue	Emley Moor Road (North)	Major Street

Route P1	Route P2	Route P3
Cleveland Avenue	Estoril Road	Malvern Crescent (South)
Clifton Avenue	Estoril Road South	McNay Street
Elton Parade	Firthmoor Crescent	Nickstream Lane (South)
Elton Road	Glebe Road	Pierremont Road
Greenmount Road	Holgate Moor	Rosedale Crescent
Hargreave Terrace	Ingleby Moor Crescent	Stooperdale Avenue
Hartford Road	Laburnum Road	Valley Street
Hill Close Avenue	Littlebeck Drive	Widdowfield Street
Leaffield Road	Mayfair Road	
Leith Road	Martindale Road (West)	
Lunedale Road (North)	Worton Drive	
Manor Road		
Pierremont Crescent		
Swaledale Avenue (North)		
The Headland		
Waverley Terrace		

RURAL AREA

C37 Bishopton to Whinney Hill
C46 Bishopton to Whitton
C37 Bishopton to C92
C40 Highside Road, Heighington
Unc South View, Heighington
Unc East Green Church Road, Heighington
Unc Church View, Heighington
Unc Hopelands Heighington
C45 Bolam Road
C39 Carlbury Crossing Road
C55 Throstle Nest Road, Walworth
C144 Over Dinsdale
C54 Low Dinsdale

Plans showing the urban and rural routes to be treated are contained at **Appendix 5**.

A risk assessment is planned for each of the urban streets removed to ascertain whether any would require salt bin provision, for example where roads have steep gradients or sharp bends.

This would give a 10.35% saving on salt usage in an average winter, which equates to 396 tonnes of salt and a saving £9,340 at present salt cost.

If the recommendation is agreed additional work would be undertaken to examine whether the number of routes could be reduced to provide additional savings.

There would be an additional saving on fuel but this cannot be calculated until the actual routes have been recalculated. Whilst there may be a saving on fuel, recent price increase may not translate this saving into a financial saving. However, this is beneficial in terms of the low carbon objectives. In some instances the gritting vehicles may still have to travel parts of the routes they previously salted in order to complete their routes.

A comparison of the level of service has been undertaken with adjacent authorities. At present 212.5 miles or 64% of the Borough's total network of 331 miles is pre-salted during a full shift.

If the identified reductions in pre-salted lengths of road were implemented then 190.5 miles would be treated, which would reduce the overall treated network to 57%.

As a comparison Durham County Council pre-salt 42%, Stockton Borough Council pre-salt 46% and Redcar and Cleveland Council pre-salt 41% of their network.

Although Darlington pre-salts a large percentage of the network there is a consistent approach to treating all bus routes and main roads in the Borough. Any further reductions may result in a reduction in connectivity with surrounding villages and areas of employment.

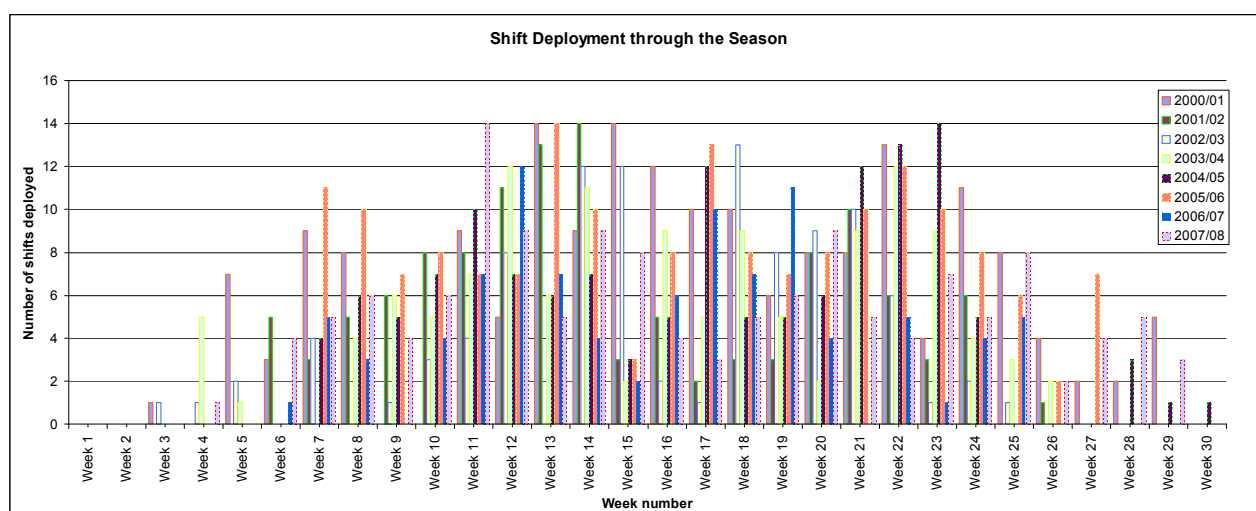
The Length of the Winter Season where Pre Planned Shifts are Available

Prior to 2005 the period where standby shifts were arranged lasted 31 weeks. This was reduced to 30 weeks for the winter of 2005 and subsequent winters. The season now starts on the first full week in October and finishes on last full week of April.

An analysis of the last eight winter seasons has been undertaken to assess whether the season can be shortened.

The graph below represents the number of shifts deployed per week over the 30 week season.

The graph demonstrates no consistency or predictability with great variations for the majority of weeks from year to year.



There have been no shifts in weeks one and two of the season. However, further investigation has identified that warnings of road temperatures falling to freezing were issued by the Met Office.

Judgements made by the winter maintenance management team resulted in pre-salting not being instigated on these occasions as road surfaces were forecast to remain dry and therefore ice would not form.

The Highways Agency will treat regardless when the road temperatures hit 2°C. This results in extensive treatment and costs. The winter maintenance management team exercise judgements to ensure treatment only happens when absolutely necessary, thus ensuring efficient use of resource.

If the winter maintenance arrangements were not in place the authority would be at risk of failing in its duty. Similarly, if a shift was required it would be very difficult to mobilise the service without a standby system in place to treat the roads.

It is therefore recommended that the season remains at 30 weeks and is reviewed regularly with ongoing changes in climate pattern.

PLANS OF ROUTES

Proposed Route P1 – Urban Area (South West Area)
Proposed Route P2 – Urban Area (Eastern Area)
Proposed Route P3 – Urban Area (North West Area)
Proposed Routes – All – Urban and Rural