

Lancashire County Council Highway Services – Winter Service

Summary of the proposal to reduce treatment intervention level from +1C to +0.5C and options to consider

The county council's current intervention level for winter treatment is when the road surface temperature is forecast to fall below +1.0C. Gritting of the whole route is instructed if the minimum forecast road surface temperature (RST), of the coldest point on that route is forecast to fall below +1.0C and hazards are forecast to be present.

This document sets out the rationale to reduce the level of the forecast road surface temperature to falling below +0.5C before gritting of the route will be instructed. This is based on evidence gathered over the last two winter seasons and consideration by county council officers in the highways service who are the decision makers regarding gritting intervention and have many years' experience. These decision makers believe that with the advancement of forecast and monitoring technology, equipment developments, existing salt storage and fleet management arrangements, an intervention level of +1.0C is too pessimistic and evidence suggests that gritting is instructed when it is not necessarily required. This results in higher overall winter maintenance costs and disruption to ordinary daytime highway maintenance activities due to downtime.

Opportunity and Risk

The provision of the winter service for the county council requires not only the management of risks but also gives an opportunity to investigate changes to current practice based on experience, evidence, changes in national guidance, best practice, collaboration and technology advances. These can be summarised as;

Opportunity

- To reduce the number of network treatments during the winter period, resulting in reduced downtime and expenditure.
- Reduction in the amount of natural mineral due to reduced salt usage.

Treatment Reductions

The following provides a summary of the previous two winters based on number of route treatment when comparing treatment intervention levels, given the same scenario.

Summary of Winter Season 2016-17

Winter period November to March with +1C intervention level

- 3046 individual route treatments undertaken countywide
- 1469 in Area East
- 851 in Area South
- 726 in Area North

Winter period November to March with +0.5C intervention level

- 2641 individual route treatments would have been undertaken countywide
- 1286 in Area East
- 750 in Area South
- 605 in Area North

Summary of Winter Season 2017-18

Winter period November to March with +1C intervention level

- 4388 individual route treatments undertaken countywide
- 2146 in Area East
- 1237 in Area South
- 1005 in Area North

Winter period November to March with +0.5C intervention level

- 3899 individual route treatments would have been undertaken countywide
- 1941 in Area East
- 1109 in Area South
- 849 in Area North

Therefore had the intervention level been +0.5C over the past two winters this would have resulted in an overall reduction of 894 individual route treatments. In reality this figure is higher due to the necessity of having to carry out multiple treatments to routes during the overnight period, especially during the last winter.

This reduced number of route treatments would have resulted in a reduction of the salt used on the network equating to a substantial amount.

Aggregating all these equates to a decrease in winter maintenance costs totalling c£220,000.00 over the two years.

Salt Reduction

Given the reduced number of treatments from the figures above, this would have resulted in a salt usage reduction of approximately 3600t. This contributes significantly to the cost saving but is also a major reduction in the amount of natural mineral used.

Risk

- The severity of the weather is not as forecast by the contracted, third party forecaster and actual conditions are worse than forecast.
- The forecast is misinterpreted by the county council Area Duty Officer (ADO) leading to a lack of appropriate action being taken by the county council to ensure that the safe passage along a highway is not endangered by snow or ice.

Inaccurate forecast - associated with this is that the safety factor of an intervention level of +1.0°C above freezing being reduced to +0.5°C reduces the margin for error by the forecaster and subsequent action lack of action by the council.

For example if a segment on a route was forecast to fall to +0.6°C but in reality the overnight road surface temperature was 1.0°C lower, resulting in an actual RST of -0.4°C, with an intervention level of +1.0°C this route is likely to have been gritted as a precaution. If the intervention level was lowered to +0.5°C, then this route is unlikely to have been gritted with a possibility that hazards may have formed on that segment of the route.

Consequently, in this scenario there is the possibility of an increased risk to the travelling public on this untreated segment of the network. However in reality the councils' forecast provider would be aware of the reduced intervention level and would notify the council when the RST fell below it, allowing the decision maker the opportunity to instruct reactive treatment to the network.

Likelihood of the actual conditions being worse than forecast

Records show that over the last two winters forecasts for Lancashire are accurate in more than 90% of cases. However overall there is a slightly pessimistic bias in interpretation of the forecast model data, this has resulted in the percentage of forecasts which are too optimistic i.e. forecast indicated RST's wouldn't fall below zero but did, of 4.4% compared to 5.8% for pessimistic forecasts i.e. forecast indicated that RST's would fall below zero but didn't.

Therefore whilst the impact of a forecasting error could be high, the likelihood of it occurring is very low.

Misinterpretation of the forecast by Area Duty Officer (ADO)

If the intervention level is +1.0°C or +0.5°C, there is the potential for the ADO to misinterpret the forecast and an inappropriate decision is made leading to potentially hazardous conditions. However the likelihood of this is low as all county council ADO's have been trained in the decision making process, are very aware of the council's winter policies, so misinterpretation should not occur or be rare. In addition there is always a senior ADO on duty scrutinising the decisions taken. This decision making process will not be affected by the change to intervention level consequently there is no increased risk to the county council from misinterpretation.

In addition all county council decision makers have recently undertaken the Institute of Highway Engineers (IHE) Professional Certificate in Winter Services Decisions Makers course, this is recognised national accreditation and acknowledges competence in this specialist field.

The mitigating factors to be considered are:-

A decision to treat a route forecast to fall below +0.5°C is in relation to the coldest section only of that route, other sections of the route will have RST's above +0.5°C and the entire route will be treated.

- The decision making process is unaffected by reducing the intervention level and the decision whether to treat or not would be taken at the same time as in previous winters.
- The council has good access to a reliable forecasting service and has numerous weather monitoring stations spread across the network, from Rossendale in the east, representing the high level Pennine routes, to Mere Brow in the west close to the west Lancashire coast ensuring a good coverage of the whole network.
- All forecasting companies have extensive data available to them, including the numerous weather stations on and around the Lancashire highway network, and have highly developed 24Hr ALARM systems to notify ADO's of any change to weather patterns and RST forecasts – such alarms are used.
- The decision maker (ADO) retains the authority to deviate from route based forecast (RBF) if the forecaster expresses low confidence in the model and believes the actual scenario is likely to be more pessimistic. This happens on occasions and the forecaster communicates any concerns he has about predicted RST's in a "forecast summary text" format or through the alert system.
- Staff are retained on a 24Hr standby throughout the winter season to ensure they can respond in short timescales to any foreseen or unforeseen weather situations.
- There is still 0.5°C to mitigate any errors in the forecast, therefore should the forecast deteriorate gritting would still be triggered prior to hazardous conditions forming.
- All decision makers and winter maintenance supervisors are very experienced and can be relied upon to make accurate assessments as to what is happening on the network and react accordingly.

Options for Consideration

Option 1 – Retain RST intervention level at "**Expected to fall below 1°C**".

Option 2 – Amend RST intervention level to "**Expected to fall below 0.5°C**".

This is the proposed level which would have resulted in at least 894 less route treatments over the past two seasons.

In summary this option results in a significant reduction in the number of treatments undertaken and it aligns with an evidence based approach to winter maintenance as recommended in the new Code of Practice – Well Managed Highway Infrastructure, which is due to be published very shortly.

For further information our neighbouring authorities currently use the following intervention levels;

Blackburn BC	+1.0°C	Blackpool BC	+1.0°C
Bolton MBC	+1.0°C	Bradford MBC	+1.0°C
Bury MBC	+0.0°C	Calderdale BC	+0.0°C
Cumbria CC	+0.0°C	Knowsley MBC	+1.0°C
North Yorks. CC	+0.0°C	St. Helens MBC	+1.0°C
Rochdale MBC	+1.0°C	Wigan MBC	+0.0°C

Highways England who manage and maintain the Motorway and Trunk Road network in England currently has an intervention level of +1.0C but they are currently considering a proposal to change this.