

CABINET

Date of Meeting	Wednesday, 25 th September 2024
Report Subject	Winter Maintenance – Decision Making Review 2024
Cabinet Member	Deputy Leader of the Council and Cabinet Member for Streetscene and Transportation
Report Author	Chief Officer, Streetscene & Transportation
Type of Report	Operational

EXECUTIVE SUMMARY

The purpose of this report is to advise Cabinet on the outcome of a review of the current decision-making process for gritting action within the Winter Maintenance Policy 2023-2025 following Cabinet's agreement in September 2023 for us to consider geographically specific treatment decision making. A budget efficiency of £25k was put forward and approved in budget setting by the County Council in February 2024, which reflects this review.

Winter service operations play a fundamental role in ensuring that our highway networks are safe and available during adverse weather conditions from around October through to April each year. The winter maintenance service is recognised as one of the most important functions that the highway authority provides.

Maintaining access to the network is crucial for emergency services, businesses, social services, education, and the public. This report outlines the current winter maintenance policy (see Appendix 1) and proposed alterations to the decision-making process and treatment routes, the legislative requirements for providing such a service, risks and the actions taken by the Streetscene and Transportation portfolio to support winter service operations.

RECOMMENDATIONS

1	Cabinet supports the proposal to transition to a domain-based approach for decision making for gritting action with a step change proposed for the 2024/2025 season.
2	Cabinet approves the proposal to a full migration to domain-based treatments from the 2025/2026 season following the outcome of the step change over the 2024/2025 season.

REPORT DETAILS

1.00	EXPLAINING THE BACKGROUND TO THE DECISION-MAKING PROCESS FOR GRITTING ACTION WITHIN THE WINTER MAINTENANCE POLICY
1.01	<p><u>Current Position</u></p> <p>The Council, as the local highway authority for county roads, has a general duty, under Section 41 of the Highways Act 1980, to maintain the highway network in a good state of repair to render it safe for ordinary traffic at all times of the year. Highway authorities in England and Wales also have a duty “to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice” (Highways Act 1980, Section A1 (TA) as modified by Section 111 of the Railways and Transport Act 2003).</p>
1.02	<p>The council’s winter maintenance service is essential in aiding the safe movement of highway users, maintaining communications, reducing delays, and enabling everyday life to continue. The Council must prioritise its response to winter weather, whilst exercising due regard to logistics and available resources.</p>
1.03	<p>The winter period is defined as between 1st October and 30th April each year and the decision-making process for carrying out winter maintenance action is carried out by nominated Duty Managers. Five Duty Managers will be rostered throughout the winter period to monitor weather forecast information and decide on appropriate preventative action. This decision will be based largely on predicted road surface temperatures (NOT air temperatures), the amount of moisture on the road and/or the amount of residual salt on the network from previous treatments.</p>
1.04	<p>The current decision-making process is based upon forecasts from the two Flintshire weather stations in Hendre and Brynford. When ice is predicted, Priority 1 routes will be pre-salted before the onset of any frost or ice. The twelve Priority 1 precautionary gritting routes account for 45% of the total County highway network.</p>
1.05	<p>When the forecasts from the two stations (Hendre and Brynford) are received, decisions for treatment are currently made for the county as a whole, based on the lowest road surface temperature forecasted, which means that all Priority 1 routes would be treated at the same time even if higher temperatures (no frost) were predicted by one of the weather stations (i.e. one out, all out).</p>
1.06	<p>Due to the topography of Flintshire, road surface temperatures can differ greatly from high routes to low lying areas, and we do see some variations in weather. During times of marginal forecasts, this can result in predicted road surface temperatures being minus (-) on the higher routes and plus (+) within the low-lying areas. This means that treatment decisions have been taken for the whole county, meaning that some roads may have been treated despite not actually reaching a temperature where a hazard could form.</p>
1.07	<p>As a result, we aspire to have domain-based forecasting, which would allow decisions to be made based on domains and not a countywide treatment, which in turn would allow us to operate a more effective service targeting domains where road surface temperatures are predicted to be lower.</p>

Looking at the county from a spatial perspective by dividing up the winter response into individual domains would allow for greater efficiency in winter action when compared to a “one out, all out” generic countywide approach.

1.08 Future Considerations / Decisions

In order to migrate to domain-based treatments, a full review of the current winter maintenance operations will be required. This includes reviewing the current weather station locations and treatment route optimisation.

Flintshire has historically been split into two climatic domains named Hendre and Brynford and, currently, these are the only two weather stations based within Flintshire (see Figure 1 below).

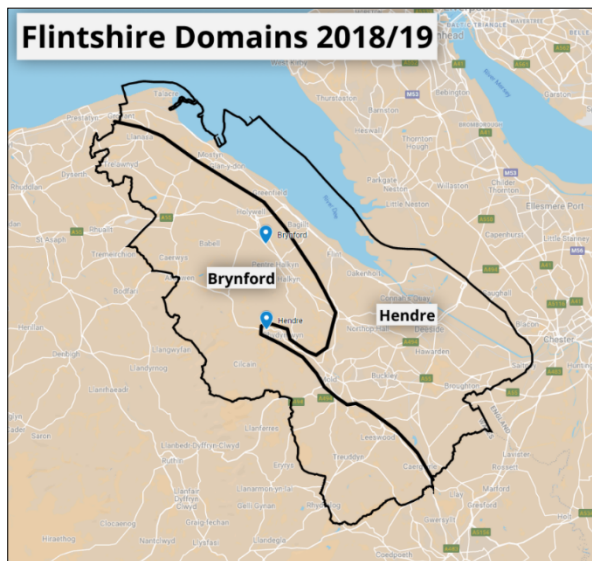


Figure 1: Flintshire’s current climatic domains in Hendre and Brynford

However, there are several other stations located on the periphery to the county boundary, which are available and accessible by the Duty Officers and could be used for route treatment decision making.

The additional weather stations are as follows: -

- Shotwick Domain - A494 Trunk Road (Cheshire)
- Rhualt and the Clwydian Range – A55 Rhualt (Denbighshire)
- Bodfari Domain – A541 Bodfari (Denbighshire)
- Bwlchgwyn Domain – Bwlchgwyn (Wrexham)

1.09 By incorporating these weather stations into our decision making, Flintshire would be able to operate with the three main domains below: -

- Clwydian Range
- Semi-High
- Coastal and Deeside

1.10 If the Priority 1 treatment routes were optimised into the above three domains, this would allow Duty Managers to treat domains separately based on the forecast for each weather station and on the topography of the county, meaning that a more efficient and selective treatment plan could be put into practice.

A full migration to domain-based treatments would be introduced for the 2025/2026 season with a step change proposed for the 2024/2025 season, in order to assess and determine whether the number of weather stations and locations of the weather stations are sufficient.

The following map in Figure 2 shows the three proposed domains that would be adopted under the proposals.

1.11

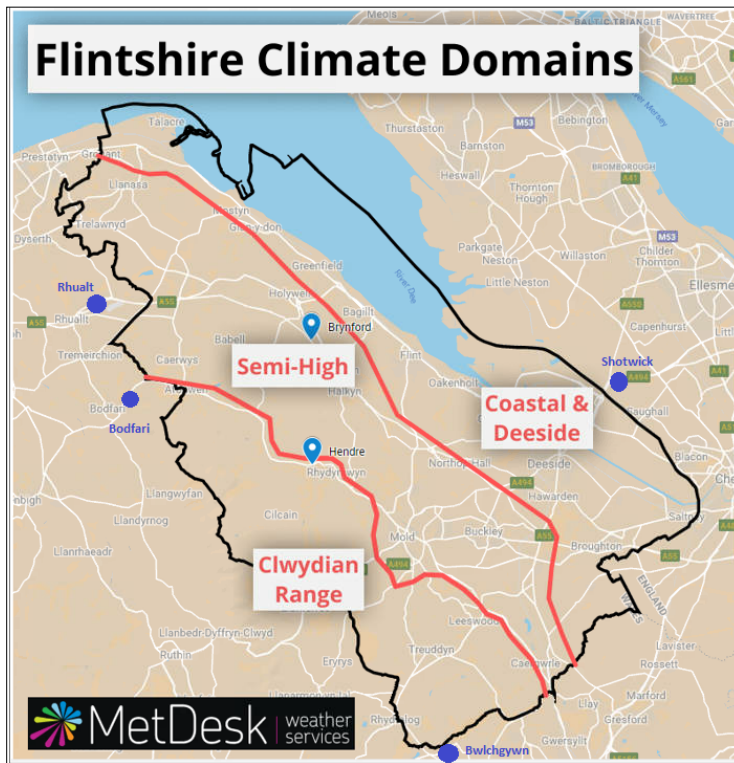


Figure 2 – Flintshire Climate Domains showing the additional weather stations in Shotwick, Rhualt, Bodfari and Bwlchgwyn, along with the three proposed domains.

1.12 Proposed Changes

By including the Rhualt, Bodfari, Shotwick and Bwlchgwyn weather stations into Flintshire’s forecasting, treatment decisions could then be made for each of the three domains, Clwydian Range, Semi-High and Coastal and Deeside. This will allow a more targeted approach on treatment areas.

With minor changes to the current treatment routes 7 and 11, which are predominantly within the Coastal and Deeside domain, when forecasts are favourable, the Coastal and Deeside domain will be monitored and not treated. This approach will only be taken outside the core winter months, which are in October, November, March and April.

December, January, and February are the core winter months when a one out, all out approach would be maintained.

1.13

Domain based decisions will only be taken when marginal temperatures are forecasted, and the likely spread rate would be the minimum of 10 grams of salt per square metre.

Domain based decisions will only affect the county road network; the trunk road network will remain unaffected and will be treated each time a decision is made.

1.14 Records show that, over the past 10 years, on average there are 30 turnouts (treatments) outside the core winter months, as demonstrated in the table below:

	No. of Runs												10 year Average
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
Oct	1	0	0	0	0	1	1	1	0	0	0	0	0
Nov	13	11	0	3	31	16	6	18	5	4	6	9	10
Dec	24	11	27	3	24	51	10	27	24	13	45	17	24
Jan	40	20	51	31	32	36	48	19	51	36	33	33	37
Feb	20	14	27	29	20	55	12	31	22	14	18	19	25
Mar	34	5	8	21	8	49	10	15	8	10	19	12	16
Apr	9	0	0	12	1	5	4	0	6	6	4	1	4
Total	141	61	113	99	116	213	91	111	116	83	125	91	116

1.15 If forecasts are favourable on the 30 average turnouts, the Deeside and Coastal route could be monitored and not treated; this is subject to the prevailing weather conditions outside the core winter months.

1.16 The following table shows the cost per treatment (per route) based on a 10 grams per meter square spreading rate. 10gm² is the lowest spread rate available to the decision maker within the North Wales Collaborative Precautionary Treatment Matrix (appendix 3).

Treatment route	Domains				Cost per Treatment
	Coastal	Semi High	Clwydian	Trunk Road	
Route 1	Yes	Yes	No	Yes	£387.20
Route 2	Yes	Yes	No	Yes	£451.20
Route 3	No	Yes	Yes	Yes	£483.20
Route 4	No	Yes	Yes	No	£419.20
Route 5	No	Yes	Yes	No	£412.80
Route 6	Yes	Yes	No	Yes	£412.80
Route 7	Yes	Yes	No	Yes	£425.60
Route 8	Yes	Yes	No	Yes	£412.80
Route 9	No	Yes	Yes	Yes	£432.00
Route 10	Yes	Yes	No	No	£400.00
Route 11	Yes	No	No	Yes	£406.40
Route 12	Yes	Yes	No	Yes	£406.40
					£5,049.60

1.17 When the weather conditions are favourable outside the core winter months, with minor alterations, route 7 and route 11 could be monitored without the variable cost of treatment. Based on monitoring 30 occasions within the Deeside and Coastal domain, routes 7 and 11 could potentially provide a financial saving of up to £25k for the authority.

1.18 It is recommended that the authority transitions to a domain-based decision-making model with a step change proposed for the 2024/2025 season to assess and determine whether the number of weather stations and locations of the weather stations are sufficient and a full migration to domain-based treatments from the 2025/2026 season.

2.00	RESOURCE IMPLICATIONS
2.01	<p>Revenue Budget: The winter maintenance service is designed to cope with an average winter, but also have the capability to be extended or adapted when winters become more severe or of a longer duration than average and the revenue budget for the service is based on expenditure in an average winter with annual fluctuations catered for by the contingency reserve fund. The revenue budget of £846k for winter maintenance consists of fixed and variable costs, which are dependent on the weather conditions throughout the season. The winter maintenance contingency reserve of £250k was drawn down last financial year (2023/24) and has not been replenished, which creates a financial risk to the authority.</p> <p>The fixed costs within the winter maintenance service are based on staffing, contractor standby, vehicles and fleet. Due to increased charges for the provision of the gritting fleet this financial year, the expected fixed costs for the winter service are £609k.</p> <p>The variable costs are based on the turnouts (i.e. treatments of the network). These are unknown at the start of each season and can only be predicted based on the data that has been recorded over the past 10 years. When heavy snow is present, the additional demand and response by Streetscene performing a 24-hour operation is estimated at an additional £150k per week.</p> <p>Winter maintenance expenditure in any single financial year is subject to the variations of the winter weather from season to season. As a result, there can be significant unpredictable fluctuations between years. The normal practice has been that, in a severe, extreme or prolonged winter season, for the excess expenditure over the average year budget to be financed from the reserve fund and, in a mild winter, the savings used to replenish the reserve. However, this is becoming less and less commonplace as the climate changes.</p> <p>Capital Budget: there are no implications for the approved capital programme for either the current financial year, although funding may be required in the future for either additional weather stations or upgrading existing weather stations.</p> <p>Human Resources: there are no implications for additional capacity or for any change to current workforce structures or roles.</p> <p>Other Resources: A full description of the resources required for the winter service is provided within the current policy in Appendix 1.</p> <p>Technology: All of the gritting fleet has global positioning satellite (GPS) and automated gritting technology. This technology improves the level of service provided in terms of accuracy, health and safety, monitoring and recording, resulting in a more cost-effective service.</p> <p>A system of 6 weather stations will be operated and used to feed into the weather forecast model and to monitor local conditions. A professional forecasting service provided by MetDesk on an all-Wales basis is used to guide treatment decisions. Information from the weather stations is fed into the weather forecast model.</p>

	<p>It is also used to check on temperature (air and road), humidity and wind speed. This enables both improved local forecasts to be obtained and actual conditions monitored. All the information can be accessed using a desktop/laptop PC or on smartphones/tablets.</p> <p>Additional funding may be required in 2025/26 for the upgrading of existing weather stations or additional weather stations once the outcome of the step change proposed for 2024/25 is known.</p>
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3.00	IMPACT ASSESSMENT AND RISK MANAGEMENT
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3.01	A domain-based forecasting system to decide when and where to salt the gritting network to the exact domains needing treatment will use a more targeted approach, which will reduce emissions from fewer vehicular movements, potentially use less rock salt, which is a finite resource, and save the authority money by reducing the number of gritting runs needed (based on an average winter).
3.02	The road network being monitored and treated over the winter will not change, but the way duty managers make gritting decisions will be changed under the proposals. Previously, the entire county was treated following a forecast of low road surface temperatures anywhere in that area. Going forward, duty managers will base their decisions on the weather and temperatures forecasted for each domain. The domain-based weather stations will underpin the decision making and treatment regime and allow for a more targeted and dynamic approach.

4.00	CONSULTATIONS REQUIRED/CARRIED OUT
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4.01	Consultation undertaken with the Deputy Leader of the Council and Cabinet Member for Streetscene and Transportation
4.02	Consultation undertaken with Trade Unions
4.03	Consultation required with Environment & Economy Overview & Scrutiny Committee

5.00	APPENDICES
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5.01	Appendix 1 – Current Winter Maintenance Policy
5.02	Appendix 2 – Report to Cabinet (September 2023) – Review of the Winter Maintenance Policy 2023/2024

6.00	LIST OF ACCESSIBLE BACKGROUND DOCUMENTS
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6.01	Agenda for Cabinet on Tuesday, 19th September, 2023, 10.00 am (flintshire.gov.uk)
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7.00	CONTACT OFFICER DETAILS
7.01	<p>Contact Officer: Barry Wilkinson, Highway Network Service Manager Telephone: 01352 704656 E-mail: barry.wilkinson@flintshire.gov.uk</p>
7.02	<p>Contact Officer: Ian Bushell, Area Operational Manager Telephone: 01352 704780 E-mail: ian.bushell@flintshire.gov.uk</p>

8.00	GLOSSARY OF TERMS
8.01	<p>Winter Maintenance: the particular network management requirements during winter are not 'maintenance' in the traditional sense, but specialist operational services responding to adverse weather events.</p>