



NWSRG
NATIONAL WINTER SERVICE RESEARCH GROUP

Section One

Foreword and using the NWSRG
Practical Guide for Winter Service

March 2021

In association with



**INSTITUTE OF
HIGHWAY
ENGINEERS**

Contents

- 1.1** Foreword
- 1.2** Introduction
- 1.3** Sections Included within the Guide
- 1.4** Purpose of the Guide
- 1.5** Scope of the Guide
- 1.6** Using the Guide
- 1.7** Contributors



Foreword

The NWSRG are pleased to present the latest version of the Practical Guide for Winter Service. This version of the guidance is the culmination of a process of detailed review to ensure that it continues to fit in with the requirements of the current national Code of Practice, 'Well-managed Highway Infrastructure'.

The guidance endorses the risk-based approach advocated by the Code of Practice, which is a change from previous, more quantitative guidance and recommendations. This approach will provide authorities with increased flexibility to implement a winter service in full accordance with local needs, priorities and affordability.

All UK public service providers are under extreme financial pressures and therefore the advice in this guidance should be considered as 'affordable best practice' for UK service providers. Whilst much of the guidance can be considered to constitute 'best practice', it also aims to avoid unaffordable and impractical solutions. Following this guidance will therefore assist authorities and practitioners to deliver a safe and affordable winter service that is both practical and achievable. The NWSRG believes that there is nothing significant in this guidance that represents a solution or process that is not currently being employed by service providers somewhere in the UK.

The NWSRG Practical Guide is subject to a rolling process of review, and therefore further updates to the guidance will continue to be published as new knowledge is developed and reliable and practical new techniques and equipment become available.

I would like to thank all those who have contributed to this guidance from both the membership of the NWSRG, the Steering Group and the Technical Advisory Group who represent a large proportion of the winter service industry in the UK, Matt Evans (TRL) and

Adrian Runacres, who provide technical advice to the NWSRG and particularly those who have made contributions on a voluntary basis over and above their day job.

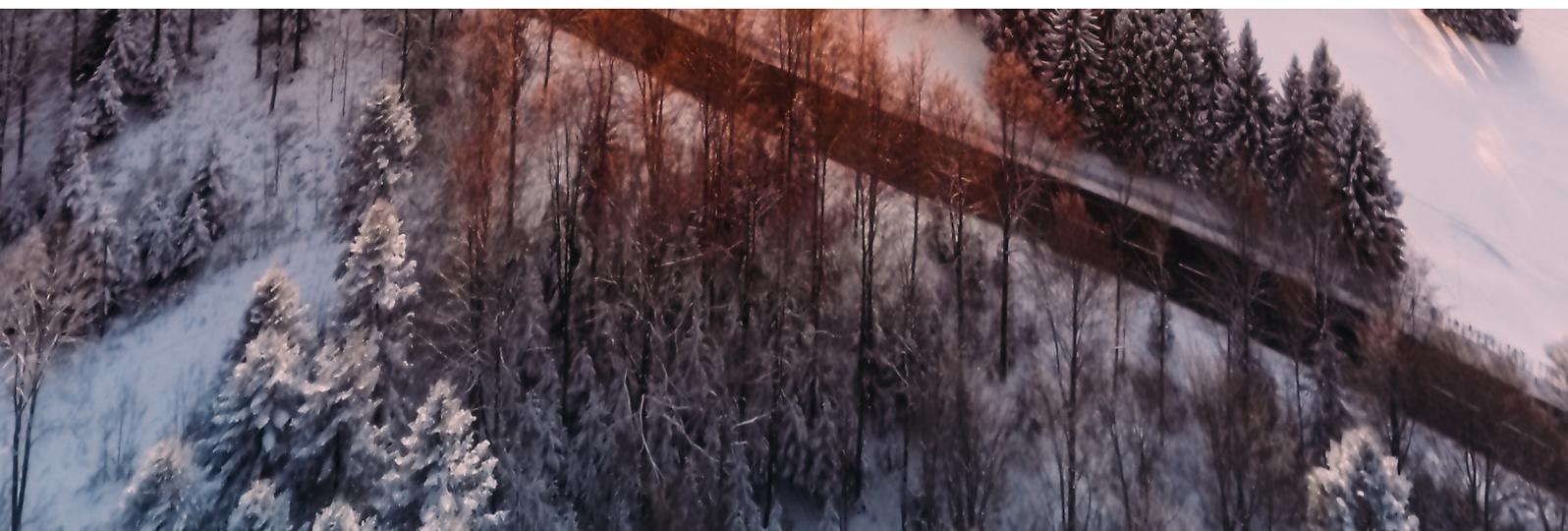
Chris Cranston

NWSRG Chair
Devon County Council
Autumn 2020



1.2 Introduction

- 1.2.1 The new Code of Practice 'Well-Managed Highway Infrastructure' was published in October 2016. The Code no longer provides detailed guidance to practitioners regarding the delivery of the winter service and the NWSRG Practical Guide is now considered the best way of providing national best practice guidance on these issues.
- 1.2.2 The Practical Guide consists of several sections so that all essential aspects of winter service are covered. Development and updating of the guidance goes through a rigorous development, review and approval process. All work is overseen by the NWSRG Steering Group with support from the Technical Advisory Group.
- 1.2.3 Initial development and drafting for each section is carried out by NWSRG consultants working with members and industry associates. Working Groups are also set up to oversee the day-to-day work on each section. Each technical section undergoes six levels of review and approval (and if necessary, this is an iterative process accounting for each level of review feedback).
- 1.2.4 The levels of review and approval are:
- I Internal Principal Research Consultant Technical Quality Review
 - I NWSRG Technical Advisor Review and approval for Steering Group Review
 - I NWSRG Steering Group Review
 - I NWSRG Technical Advisor Final Review
 - I NWSRG Steering Group Approval for use by members
 - I UKRB/UKRLG Approval for general publication as National Guidance



1.3 Sections Included within the Guide

1.3.1 The Guide consists of a series of discrete sections, that will be revised and updated as required to align with the latest developments in winter service research and practice. The thirteen current sections are shown and described in Table 1.3.1 below:

Table 1.3.1 - Overview of the NWSRG Practical Guide Contents

Guidance Section	Contents
1. Foreword and Using the Guide	Information on the basis and status of the Guide along with information on its layout and use
2. Planning	Guidance to help authorities review their current policies and practices and provide ease of reference to relevant information within other sections of the Guide.
3. De-icer Types	Guidance on the types of de-icer available, how de-icers work and the key factors that affect de-icer performance, storage requirements with environmental and infrastructure considerations.
4. Treatment Methods	Guidance on how de-icers can be applied and the key factors to consider in deciding the most suitable options for local circumstances.
5. Salt Storage	Guidance on the storage and monitoring requirements to enable salt to be maintained in good condition.
6. Spreader Management	Guidance on the important elements of the calibration procedure, practical guidance on how to carry this out and monitoring performance after calibration.
7. Decision Making	Guidance to support decisions relating to treatment actions.
8. Precautionary Salt Spreading Rates	Guidance on the key factors that affect precautionary spread rates and how to determine appropriate rates for local circumstances.
9. Treatments for Snow and Ice	Guidance on how to carry out treatments before, during and after snow and ice, including spread rates, ploughing equipment and practices.
10. Treatments for Extreme Cold	Guidance on the types of de-icer suitable for treatments in extreme cold, storage requirements, spread rates and treatment strategies, environmental and infrastructure considerations.
11. Footways and Cycleways	Guidance on the selection and prioritisation of footways and cycleways for treatment, types of de-icer and spreading equipment, and the use of weather forecasting and station data to aid treatment decision making.
12. Weather Forecasting and Road Weather Information Systems	Guidance on requirements for weather forecasting and road weather information systems.
13. Route Selection and Optimisation	Guidance on applying a risk-based approach to select routes (carriageways, footways and cycleways)

1.4 Purpose of the Guide

- 1.4.1 The main purpose of this Guide is to provide affordable good practice guidance for all aspects of winter service delivery to UK roads.
- 1.4.2 The Guide has been developed for staff with responsibility for providing winter service, but is particularly relevant to:
- Policy makers and members responsible for setting and approving winter service operations
 - Managers and staff responsible for planning and procuring winter service operations
 - Managers and staff responsible for planning and optimising route selection, arranging de-icer supplies and storage
 - Managers and staff responsible for decision making – when to spread and determining appropriate spread rates
 - Technicians responsible for calibrating and operating the spreader vehicles and other equipment
 - The Guide also provides important information to members, directors and high-level managers wishing to review and improve their winter service operations, set new policy, develop business cases for renewal, investment, etc.
- 1.4.3 Authorities and other winter service providers should review their policies and practices against the content of the NWSRG Practical Guide.
- 1.4.4 The review should identify and explain any significant variance, using a risk-based approach, and, where appropriate, develop time tabled implementation plans for the adoption of the detailed national best practice guidance and recommendations.
- 1.4.5 England, Scotland, Wales and Northern Ireland are subject to separate legislation that can vary significantly with respect to the statutory duties and obligations of Highway and Roads Authorities. However, wherever an authority or service provider is based across the United Kingdom, the Guide aims to answer the question:

“What is needed to provide a practical, safe, efficient, sustainable and cost-effective winter service?”

Rather than just setting out a list of high-level legislation, policy requirements and aspirations, the Guide will provide practical ‘hands on’ guidance for managers and practitioners who have to define and deliver the service.

1.5 Scope of the Guide

- 1.5.1 This Guide covers all the main aspects of winter service from policy through planning, procurement and set-up then on to the details of management and service delivery.
- As the main anti-icing and de-icing product used in the UK is sodium chloride salt (NaCl) this is dealt with in the most detail (products are generically referred to as de-icers in the guidance whether used for de-icing or anti-icing)
 - Alternative de-icers to salt are also discussed, particularly in relation to extreme cold conditions (lower than -7°C or -5°C in low humidity conditions) where they become a more viable and economical alternative as sodium chloride becomes a less effective treatment due to slow to non-existent rates of dissolution
 - The principal method of delivering de-icer to UK paved surfaces and in particular roads is through lorry based spreading vehicles.
 - Guidance is provided on their use and calibration
 - Details are provided on the most frequently used methods or technologies for delivering de-icers (Dry Spreading, Pre-wet Spreading, Treated salt spreading and Brine spreading)
 - Other methods of de-icer delivery are identified but detail on their setup and use is limited
 - Making treatment decisions is discussed in detail and information provided on how the many variables that may be encountered for any given decision can be considered
 - The guidance provides information on setting winter service policy and developing winter service plans
 - Advice is provided for both precautionary and reactionary treatments including de-icer spreading, snow removal and ice removal
 - While road surfaces are the main target for winter service actions the guidance also provides information for other paved surfaces and in particular footways, footpaths and cycleways
 - Weather forecasting and the use of Road Weather Information Systems (RWIS) are discussed
 - Guidance is provided on making value decisions and developing business cases for winter service procurement and delivery

1.6 Using the Guide

- 1.6.1 The sections follow a logical progression through the planning and provision of a winter service
- 1.6.2 Individual sections address a particular aspect of the process from policy and planning to the technical details involved in setting up, managing and delivering the winter service.
- 1.6.3 The guidance will help authorities to review their policies and practices and includes checklists and self-assessment questionnaires to help guide this process.
- 1.6.4 Case studies are provided showing examples of good practice from a range of authorities with different local circumstances and priorities.

1.7 Contributors

- 1.7.1 The production of this practical guide would have been impossible without the assistance of numerous contributors. In particular, these have included NWSRG Industry Associates and Member Authorities who have submitted case studies for reference within the guide and provided invaluable expertise and advice. As well as UK Roads Board and UK Roads Liaison Group review and oversight, Adrian Runacres, the NWSRG Steering Group's Technical Consultant and TRL, Research Contractor, the following public sector organisations are acknowledged as making a particularly significant contribution to the guidance:

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| ■ Highways England | ■ Derby City Council | ■ Hertfordshire County Council |
| ■ Northern Ireland Department for Infrastructure | ■ Devon County Council | ■ Kent County Council |
| ■ Transport Scotland | ■ Doncaster Borough Council | ■ Milton Keynes Council |
| ■ Welsh Government Department for Economy and Infrastructure | ■ East Riding of Yorkshire Council | ■ Norfolk County Council |
| ■ Bournemouth, Christchurch and Poole Council | ■ Essex County Council | ■ Rhondda Cynon Taf County Borough Council |
| ■ Bristol City Council | ■ Falkirk Council | ■ Transport for London |
| | ■ Glasgow City Council | ■ Institute of Highway Engineers |
| | ■ Gloucestershire County Council | |



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